



**FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E**

**TEST REPORT**

**For**

**2G Mobile Phone**

**Model: P111**

**Trade Name: AIO**

*Issued to*

**XingLiYangChen Technology co. Ltd**  
**Room A1818, baohua Building, huaqiang Road, Futian District,**  
**Shenzhen City, China**

*Issued by*



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## 1. TEST RESULT CERTIFICATION

**Applicant:** XingLiYangChen Technology co. Ltd  
Room A1818, baohua Building, huaqiangRoad, Futian District,  
Shenzhen City, China

**Equipment Under Test:** 2G Mobile Phone

**Trade Name:** AIO

**Model Number:** P111

**Date of Test:** August 30 ~ September 3, 2010

| APPLICABLE STANDARDS                                |                         |
|---|-------------------------|
| STANDARD  | TEST RESULT             |
| FCC 47 CFR Part 22 Subpart H &<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:

Reviewed by:

David Wang

Gina Lo

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David Wang  
Section Manager  
Compliance Certification Services Inc.

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Gina Lo  
Section Manager  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

|  |   |
|--|---|
| <b>Product</b>                                   | 2G Mobile Phone   |
| <b>Trade Name</b>                                | AIO   |
| <b>Model Number</b>                              | P111  |
| <b>Model Discrepancy</b>                         | N/A   |
| <b>Power Supply</b>                              | 1. Power Adapter:<br>YIFANXING / YF-268A<br>I/P: AC 110V - 240V<br>O/P: DC 5V<br>2. Battery:<br>Rating: 1200mAh, 3.7V, 4.44Wh |
| <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: 25.57dBm<br>GSM 1900: 30.75 dBm<br>GPRS 850: 25.54 dBm<br>GPRS 1900: 30.07 dBm                                       |
| <b>Modulation Technique</b>                      | GSM: GMSK<br>GPRS: GMSK   |
| <b>Type of Emission</b>                          | GSM 850: 244KGXW---<br>GSM 1900: 247KGXW---<br>GPRS 850: 243KGXW---<br>GPRS 1900: 241KGXW---                                  |
| <b>Antenna Gain</b>                              | GSM / GPRS 850: -1.46 dBi<br>GSM / GPRS 1900: -0.78 dBi   |
| <b>Antenna Type</b>                              | PIFA antenna  |

**Remark:**

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **YSV-1X0L9Y1C3** 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, Part 2, PART 22 SUBPART H AND PART 24 SUBPART E

#### **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 30MHz 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: P111) 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 and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

Based on the above results from the different modulations, GSM850 / GSM1900 / GPRS 850 / GPRS1900 were determined to be the worst-case scenario for all tests.

The worst emission was found:

in lie-down (X axis) for GSM 1900 /GPRS 1900 mode and  
stand-up position (Z axis) for GSM 850 / GPRS 850 mode



## **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.

| Conducted Emissions Test Site |              |           |               |                 |
|-------------------------------|--------------|-----------|---------------|-----------------|
| Name of Equipment             | Manufacturer | Model     | Serial Number | Calibration Due |
| Spectrum Analyzer             | Agilent      | E4446A    | MY43360131    | 03/03/2011      |
| Power Meter                   | Agilent      | E4416A    | GB41291611    | 06/27/2011      |
| Power Sensor                  | Agilent      | E9327A    | US40441097    | 06/27/2011      |
| Temp. / Humidity Chamber      | Terchy       | MHG-150LF | 930619        | 09/14/2011      |
| DC Power Source               | Agilent      | E3640A    | MY40001774    | 01/08/2011      |

| 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) |                          |               |                 |

| Powerline Conducted Emissions Test Site |              |        |               |                 |
|---|--------------|--------|---------------|-----------------|
| Name of Equipment                       | Manufacturer | Model  | Serial Number | Calibration Due |
| EMI Test Receiver                       | R&S          | ESHS30 | 828144/003    | 12/06/2010      |
| LISN                                    | EMCO         | 3825/2 | 9106-1809     | 05/02/2011      |
| LISN                                    | SCHAFFNER    | NNB 41 | 03/10013      | 12/03/2010      |
| Test S/W                                | CCS-3A1-CE   |        |               |                 |





### 4.3 MEASUREMENT UNCERTAINTY

| PARAMETER                             | UNCERTAINTY |
|---------------------------------------|-------------|
| Powerline Conducted Emission          | +/- 1.6202  |
| 3M Semi Anechoic Chamber / 30M~200M   | +/- 4.0606  |
| 3M Semi Anechoic Chamber / 200M~1000M | +/- 3.9979  |
| 3M Semi Anechoic Chamber / 1G~8G      | +/- 2.5790  |
| 3M Semi Anechoic Chamber / 8G~18G     | +/- 2.5928  |
| 3M Semi Anechoic Chamber / 18G~26G    | +/- 2.7212  |
| 3M Semi Anechoic Chamber / 26G~40G    | +/- 2.9520  |

**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**

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

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

☒ 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 I for the actual connections between EUT and support equipment.

### **6.2 SUPPORT EQUIPMENT**

| No. | Device Type                                   | Brand | Model  | FCC ID | Series No. | Data Cable | Power Cord       |
|-----|---|-------|--------|--------|------------|------------|------------------|
| 1.  | Universal Radio Communication Tester (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.*



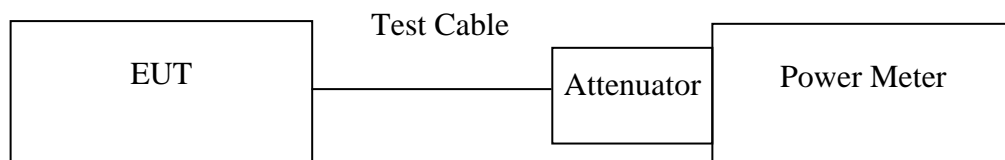
## 7. FCC PART 22 & 24 REQUIREMENTS

### 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             | 128 | 824.20          | 31.70            | 1.4791         |
|                     | 190 | 836.40          | 32.30            | 1.6982         |
|                     | 251 | 848.80          | 32.50            | 1.7783         |
| GPRS 850 (Class 10) | 128 | 824.20          | 31.60            | 1.4454         |
|                     | 190 | 836.40          | 32.34            | 1.7140         |
|                     | 251 | 848.80          | 32.40            | 1.7378         |

| Test Mode            | CH  | Frequency (MHz) | Peak Power (dBm) | Output Power W |
|----------------------|-----|-----------------|------------------|----------------|
| GSM 1900             | 512 | 1850.20         | 29.10            | 0.8128         |
|                      | 661 | 1880.00         | 29.20            | 0.8318         |
|                      | 810 | 1909.80         | 28.80            | 0.7586         |
| GPRS 1900 (Class 10) | 512 | 1850.20         | 28.75            | 0.7499         |
|                      | 661 | 1880.00         | 28.50            | 0.7079         |
|                      | 810 | 1909.80         | 28.60            | 0.7244         |

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

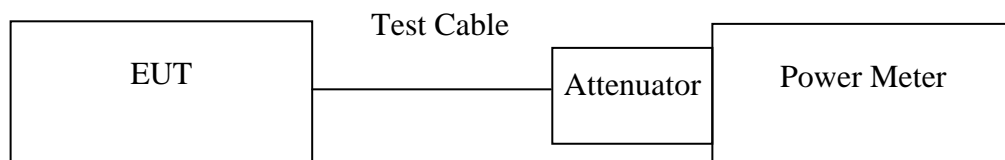


## 7.2 AVERAGE POWER

### 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             | 128 | 824.20          | 31.60           | 1.4454         |
|                     | 190 | 836.40          | 30.20           | 1.0471         |
|                     | 251 | 848.80          | 32.40           | 1.7378         |
| GPRS 850 (Class 10) | 128 | 824.20          | 31.50           | 1.4125         |
|                     | 190 | 836.40          | 32.24           | 1.6749         |
|                     | 251 | 848.80          | 32.20           | 1.6596         |

| Test Mode            | CH  | Frequency (MHz) | AVG Power (dBm) | Output Power W |
|----------------------|-----|-----------------|-----------------|----------------|
| GSM 1900             | 512 | 1850.20         | 29.03           | 0.7998         |
|                      | 661 | 1880.00         | 29.10           | 0.8128         |
|                      | 810 | 1909.80         | 28.70           | 0.7413         |
| GPRS 1900 (Class 10) | 512 | 1850.20         | 28.64           | 0.7311         |
|                      | 661 | 1880.00         | 28.36           | 0.6855         |
|                      | 810 | 1909.80         | 28.44           | 0.6982         |

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





## 7.3 ERP & EIRP MEASUREMENT

### LIMIT

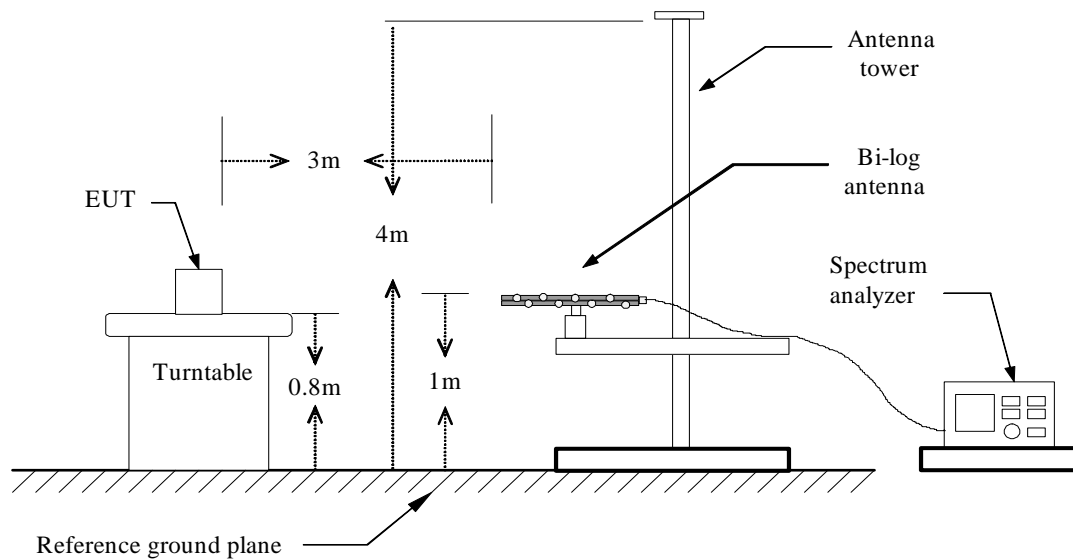
According to FCC §2.1046

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

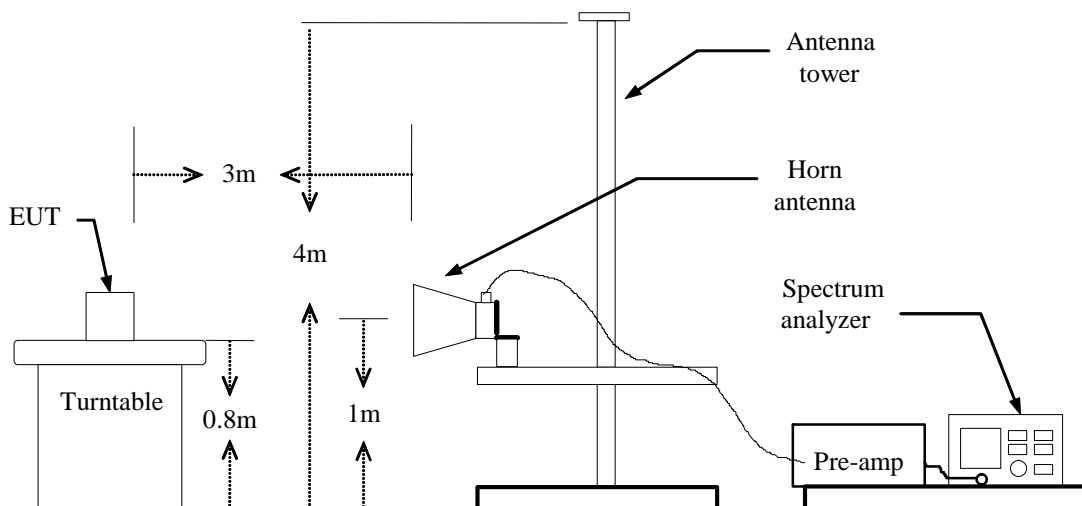
FCC 24.232(b): The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

### Test Configuration

#### Below 1 GHz

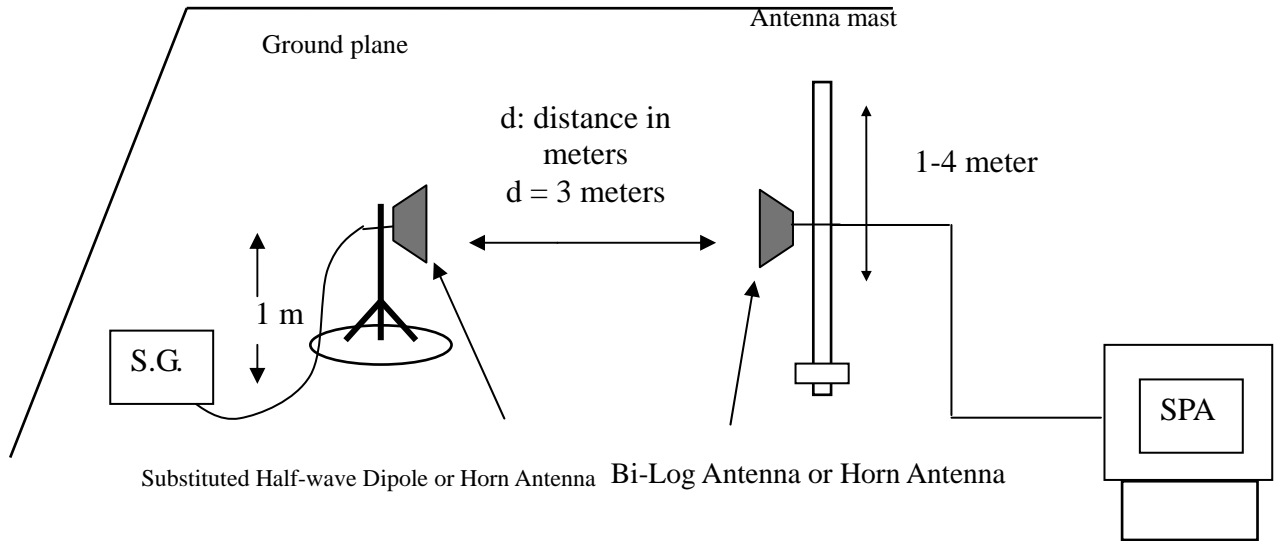


#### Above 1 GHz





## For Substituted Method Test Set-UP



## TEST PROCEDURE

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

During the measurement 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****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     | 824.20          | V            | -12.25              | 35.66                  | 23.41                | 38.50       | -15.09      |
|          |         | 824.20          | H            | -10.95              | 35.10                  | 24.14                | 38.50       | -14.36      |
|          | 190     | 836.60          | V            | -11.62              | 35.38                  | 23.76                | 38.50       | -14.74      |
|          |         | 836.60          | H            | -10.74              | 35.07                  | 24.33                | 38.50       | -14.17      |
|          | 251     | 848.80          | V            | -11.74              | 35.24                  | 23.50                | 38.50       | -15.00      |
|          |         | 848.80          | H            | -10.59              | 35.20                  | 24.61                | 38.50       | -13.89      |
| Y        | 128     | 824.20          | V            | -16.63              | 35.66                  | 19.03                | 38.50       | -19.47      |
|          |         | 824.20          | H            | -10.56              | 35.10                  | 24.54                | 38.50       | -13.96      |
|          | 190     | 836.60          | V            | -15.53              | 35.38                  | 19.86                | 38.50       | -18.64      |
|          |         | 836.60          | H            | -11.08              | 35.07                  | 23.99                | 38.50       | -14.51      |
|          | 251     | 848.80          | V            | -14.22              | 35.24                  | 21.02                | 38.50       | -17.48      |
|          |         | 848.80          | H            | -11.39              | 35.20                  | 23.81                | 38.50       | -14.69      |
| Z        | 128     | 824.20          | V            | -10.42              | 35.66                  | 25.24                | 38.50       | -13.26      |
|          |         | 824.20          | H            | -15.91              | 35.10                  | 19.18                | 38.50       | -19.32      |
|          | 190     | 836.60          | V            | -10.29              | 35.38                  | 25.10                | 38.50       | -13.40      |
|          |         | 836.60          | H            | -17.30              | 35.07                  | 17.77                | 38.50       | -20.73      |
|          | 251     | 848.80          | V            | -9.67               | 35.24                  | <b>*25.57</b>        | 38.50       | -12.93      |
|          |         | 848.80          | H            | -16.30              | 35.20                  | 18.90                | 38.50       | -19.60      |

**GPRS 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     | 824.20          | V            | -14.24              | 35.66                  | 21.41                | 38.50       | -17.09      |
|          |         | 824.20          | H            | -10.98              | 35.10                  | 24.12                | 38.50       | -14.38      |
|          | 190     | 836.60          | V            | -14.28              | 35.38                  | 21.10                | 38.50       | -17.40      |
|          |         | 836.60          | H            | -11.66              | 35.07                  | 23.41                | 38.50       | -15.09      |
|          | 251     | 848.80          | V            | -14.06              | 35.24                  | 21.18                | 38.50       | -17.32      |
|          |         | 848.80          | H            | -12.01              | 35.20                  | 23.19                | 38.50       | -15.31      |
| Y        | 128     | 824.20          | V            | -14.53              | 35.66                  | 21.13                | 38.50       | -17.37      |
|          |         | 824.20          | H            | -9.86               | 35.10                  | 25.24                | 38.50       | -13.26      |
|          | 190     | 836.60          | V            | -14.91              | 35.38                  | 20.47                | 38.50       | -18.03      |
|          |         | 836.60          | H            | -10.87              | 35.07                  | 24.20                | 38.50       | -14.30      |
|          | 251     | 848.80          | V            | -15.55              | 35.24                  | 19.69                | 38.50       | -18.81      |
|          |         | 848.80          | H            | -10.64              | 35.20                  | 24.56                | 38.50       | -13.94      |
| Z        | 128     | 824.20          | V            | -10.12              | 35.66                  | <b>*25.54</b>        | 38.50       | -12.96      |
|          |         | 824.20          | H            | -14.54              | 35.10                  | 20.56                | 38.50       | -17.94      |
|          | 190     | 836.60          | V            | -10.42              | 35.38                  | 24.97                | 38.50       | -13.53      |
|          |         | 836.60          | H            | -15.66              | 35.07                  | 19.41                | 38.50       | -19.09      |
|          | 251     | 848.80          | V            | -9.92               | 35.24                  | 25.32                | 38.50       | -13.18      |
|          |         | 848.80          | H            | -14.94              | 35.20                  | 20.26                | 38.50       | -18.24      |

**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     | 1850.20         | V            | -17.06              | 42.27                  | 25.21                | 33.00       | -7.79       |
|          |         | 1850.20         | H            | -11.76              | 42.51                  | <b>*30.75</b>        | 33.00       | -2.25       |
|          | 661     | 1880.00         | V            | -18.32              | 42.16                  | 23.84                | 33.00       | -9.16       |
|          |         | 1880.00         | H            | -12.41              | 42.46                  | 30.05                | 33.00       | -2.95       |
|          | 810     | 1909.80         | V            | -19.06              | 42.03                  | 22.97                | 33.00       | -10.03      |
|          |         | 1909.80         | H            | -12.72              | 42.37                  | 29.65                | 33.00       | -3.35       |
| Y        | 512     | 1850.20         | V            | -13.67              | 42.27                  | 28.61                | 33.00       | -4.39       |
|          |         | 1850.20         | H            | -14.46              | 42.51                  | 28.05                | 33.00       | -4.95       |
|          | 661     | 1880.00         | V            | -13.57              | 42.16                  | 28.59                | 33.00       | -4.41       |
|          |         | 1880.00         | H            | -14.38              | 42.46                  | 28.08                | 33.00       | -4.92       |
|          | 810     | 1909.80         | V            | -14.21              | 42.03                  | 27.82                | 33.00       | -5.18       |
|          |         | 1909.80         | H            | -14.16              | 42.38                  | 28.21                | 33.00       | -4.79       |
| Z        | 512     | 1850.20         | V            | -14.70              | 42.27                  | 27.57                | 33.00       | -5.43       |
|          |         | 1850.20         | H            | -18.13              | 42.51                  | 24.38                | 33.00       | -8.62       |
|          | 661     | 1880.00         | V            | -13.99              | 42.16                  | 28.17                | 33.00       | -4.83       |
|          |         | 1880.00         | H            | -18.41              | 42.46                  | 24.05                | 33.00       | -8.95       |
|          | 810     | 1909.80         | V            | -15.23              | 42.03                  | 26.80                | 33.00       | -6.20       |
|          |         | 1909.80         | H            | -19.94              | 42.38                  | 22.43                | 33.00       | -10.57      |

**GPRS 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     | 1850.20         | V            | -18.52              | 42.27                  | 23.75                | 33.00       | -9.25       |
|          |         | 1850.20         | H            | -12.44              | 42.51                  | <b>*30.07</b>        | 33.00       | -2.93       |
|          | 661     | 1880.00         | V            | -19.64              | 42.16                  | 22.52                | 33.00       | -10.48      |
|          |         | 1880.00         | H            | -12.85              | 42.46                  | 29.61                | 33.00       | -3.39       |
|          | 810     | 1909.80         | V            | -19.92              | 42.03                  | 22.11                | 33.00       | -10.89      |
|          |         | 1909.80         | H            | -13.33              | 42.38                  | 29.05                | 33.00       | -3.95       |
| Y        | 512     | 1850.20         | V            | -14.49              | 42.27                  | 27.79                | 33.00       | -5.21       |
|          |         | 1850.20         | H            | -14.01              | 42.51                  | 28.50                | 33.00       | -4.50       |
|          | 661     | 1880.00         | V            | -15.34              | 42.16                  | 26.82                | 33.00       | -6.18       |
|          |         | 1880.00         | H            | -14.41              | 42.46                  | 28.05                | 33.00       | -4.95       |
|          | 810     | 1909.80         | V            | -15.96              | 42.03                  | 26.07                | 33.00       | -6.93       |
|          |         | 1909.80         | H            | -14.95              | 42.38                  | 27.42                | 33.00       | -5.58       |
| Z        | 512     | 1850.20         | V            | -15.14              | 42.27                  | 27.14                | 33.00       | -5.86       |
|          |         | 1850.20         | H            | -19.25              | 42.51                  | 23.26                | 33.00       | -9.74       |
|          | 661     | 1880.00         | V            | -14.70              | 42.16                  | 27.47                | 33.00       | -5.53       |
|          |         | 1880.00         | H            | -19.13              | 42.46                  | 23.33                | 33.00       | -9.67       |
|          | 810     | 1909.80         | V            | -15.97              | 42.03                  | 26.06                | 33.00       | -6.94       |
|          |         | 1909.80         | H            | -20.02              | 42.38                  | 22.36                | 33.00       | -10.64      |

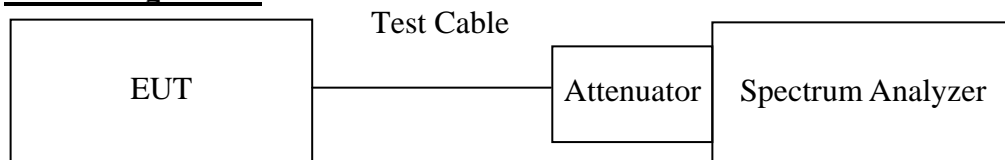


## **7.4 OCCUPIED BANDWIDTH MEASUREMENT**

### **LIMIT**

According to §FCC 2.1049.

### **Test Configuration**



*Remark: Measurement setup for testing on Antenna connector*

### **TEST PROCEDURE**

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

### **TEST RESULTS**

*No non-compliance noted*

**Test Data**

| Test Mode           | CH  | Frequency (MHz) | 99% Bandwidth (kHz) |
|---------------------|-----|-----------------|---------------------|
| GSM 850             | 128 | 824.200         | 243.7900            |
|                     | 190 | 836.600         | 243.0410            |
|                     | 251 | 848.800         | 244.8178            |
| GPRS 850 (Class 10) | 128 | 824.200         | 239.9757            |
|                     | 190 | 836.600         | 243.1923            |
|                     | 251 | 848.800         | 242.3885            |

| Test Mode            | CH  | Frequency (MHz) | 99% Bandwidth (kHz) |
|----------------------|-----|-----------------|---------------------|
| GSM 1900             | 512 | 1850.200        | 243.8845            |
|                      | 661 | 1880.000        | 246.8105            |
|                      | 810 | 1909.800        | 247.0909            |
| GPRS 1900 (Class 10) | 512 | 1850.200        | 241.9200            |
|                      | 661 | 1880.000        | 241.4106            |
|                      | 810 | 1909.800        | 238.6293            |

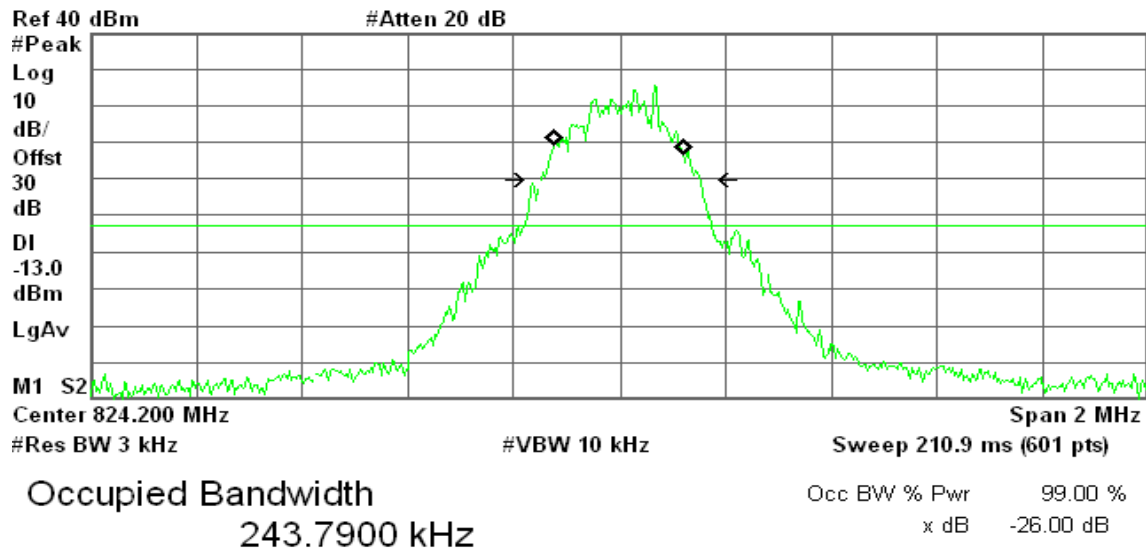


## Test Plot

### GSM 850 (CH Low)

Agilent 15:05:15 Sep 3, 2010

R T

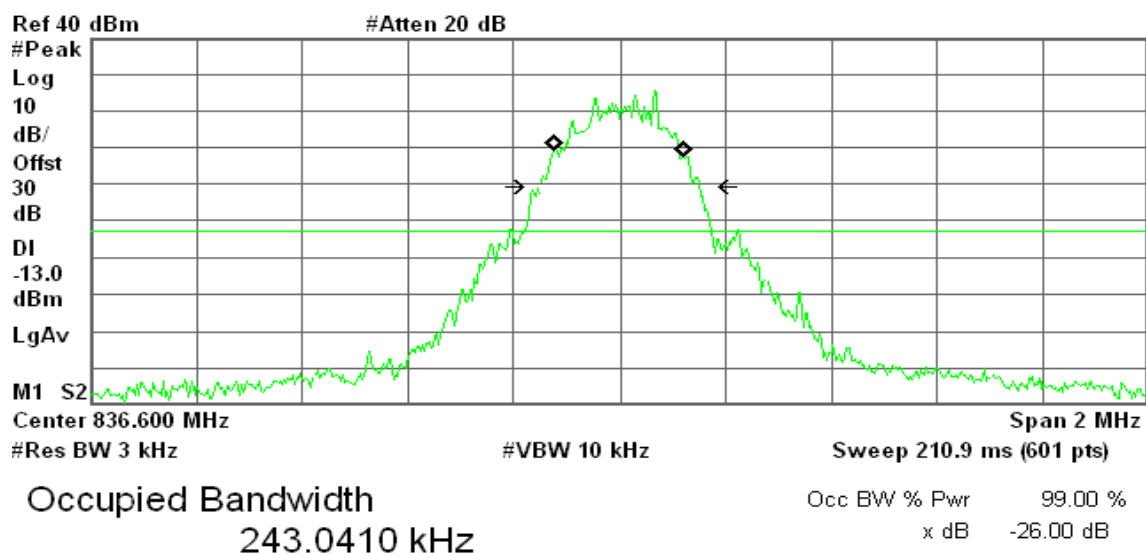


Transmit Freq Error -675.771 Hz  
x dB Bandwidth 299.758 kHz

### GSM 850 (CH Mid)

Agilent 14:39:27 Sep 3, 2010

R T



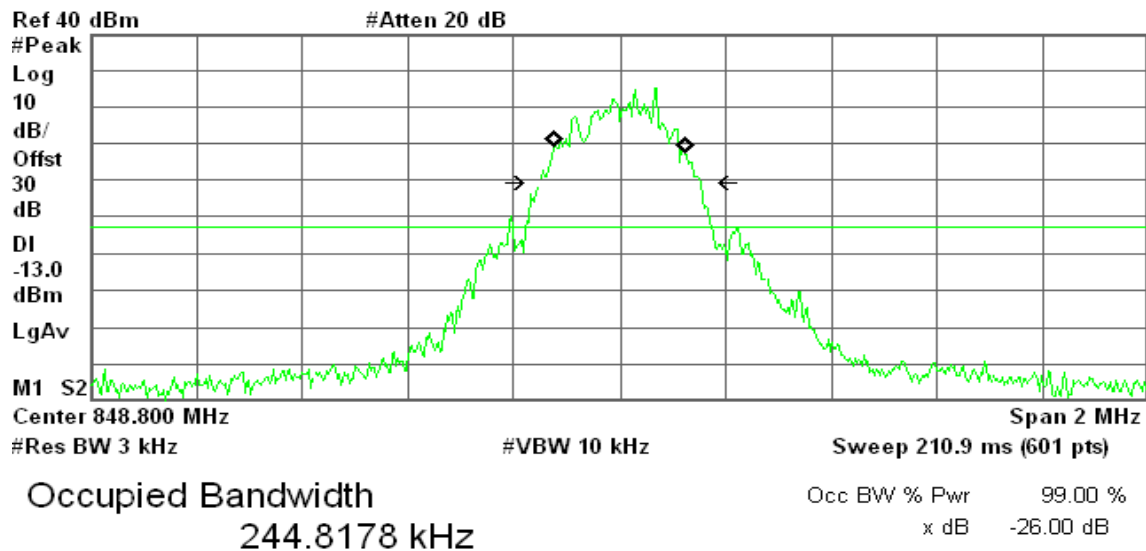
Transmit Freq Error -1.117 kHz  
x dB Bandwidth 299.786 kHz



## GSM 850 (CH High)

Agilent 14:39:59 Sep 3, 2010

R T

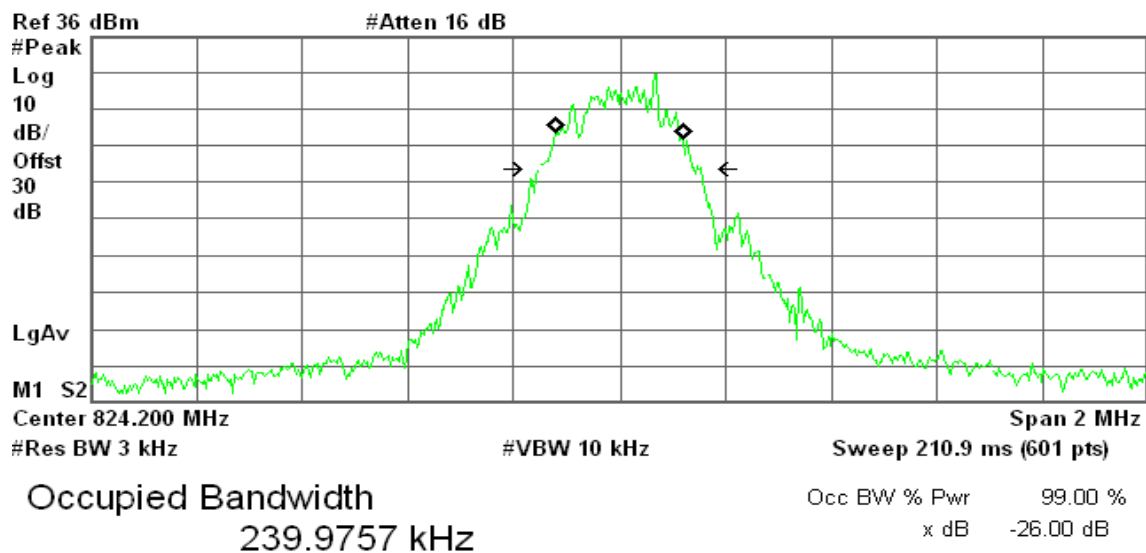


Transmit Freq Error 404.378 Hz  
x dB Bandwidth 301.969 kHz

## GPRS 850 (CH Low)

Agilent 13:33:15 Sep 3, 2010

R T



Transmit Freq Error -780.934 Hz  
x dB Bandwidth 302.323 kHz

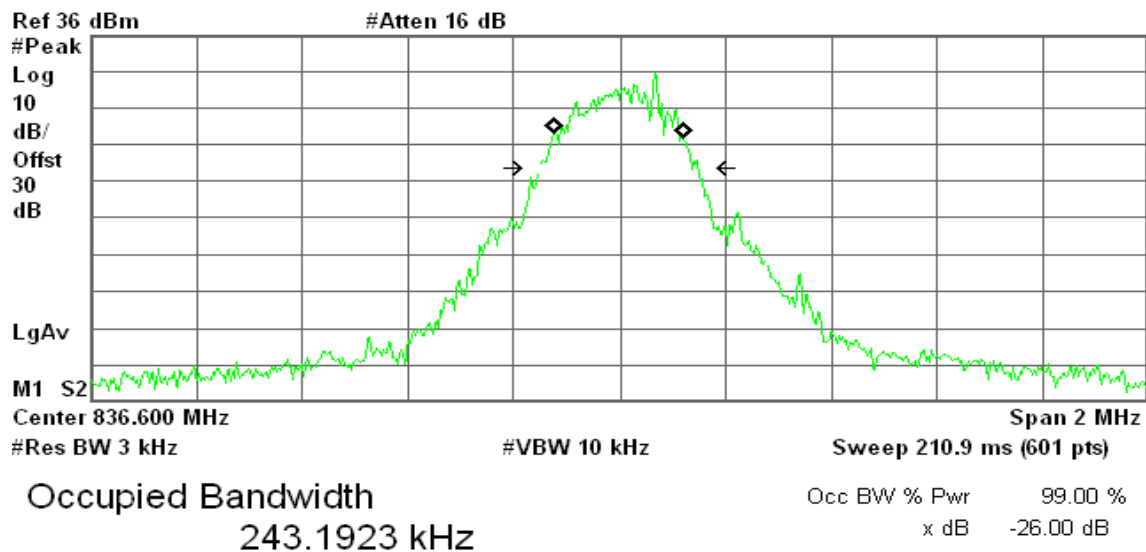




## GPRS 850 (CH Mid)

Agilent 13:34:25 Sep 3, 2010

R T

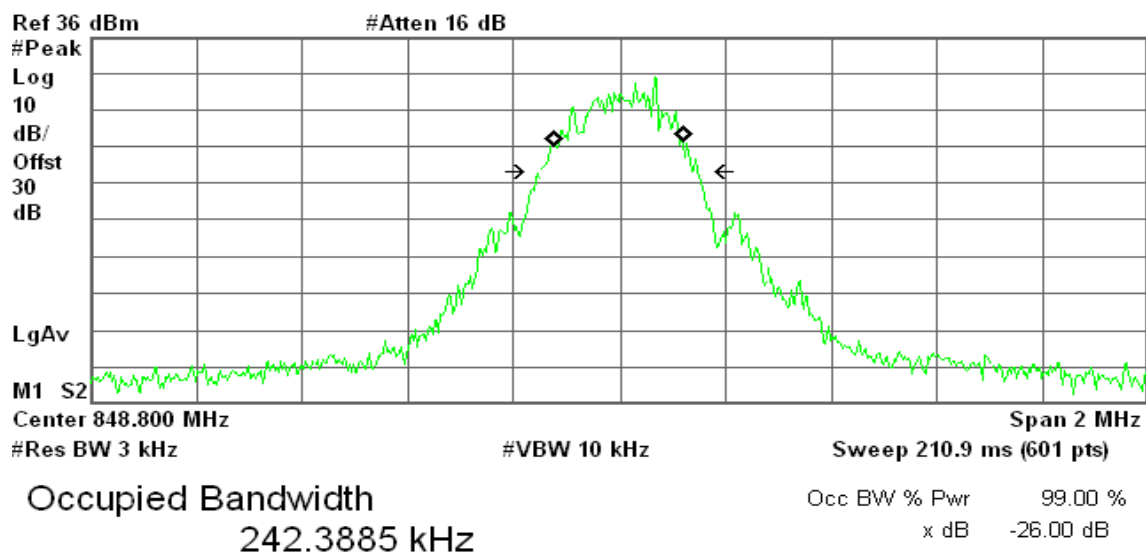


Transmit Freq Error -1.674 kHz  
x dB Bandwidth 297.283 kHz

## GPRS 850(CH High)

Agilent 13:34:57 Sep 3, 2010

R T



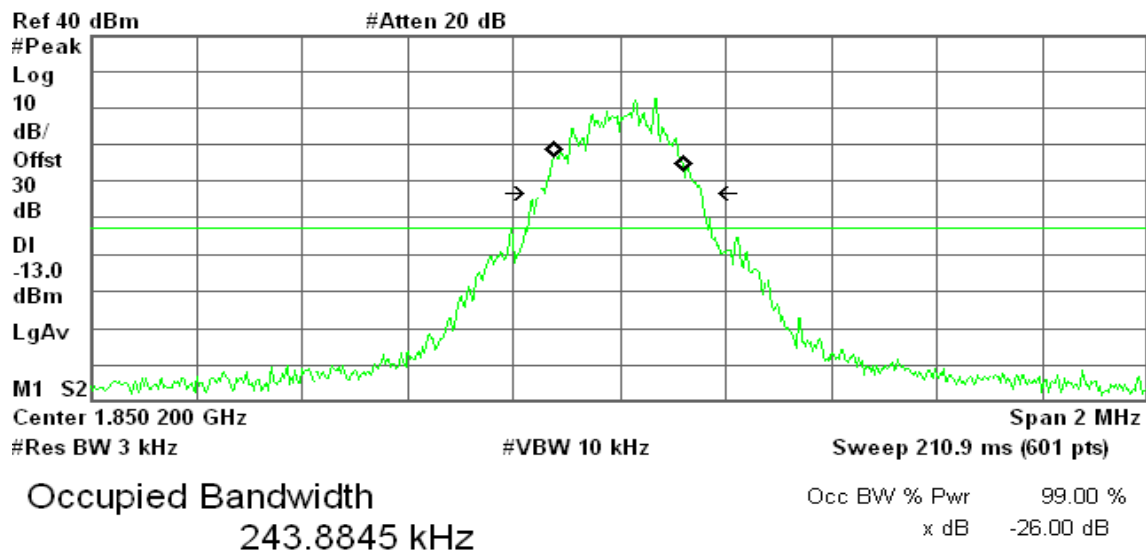
Transmit Freq Error -1.518 kHz  
x dB Bandwidth 295.500 kHz



## GSM 1900 (CH Low)

Agilent 15:00:06 Sep 3, 2010

R T

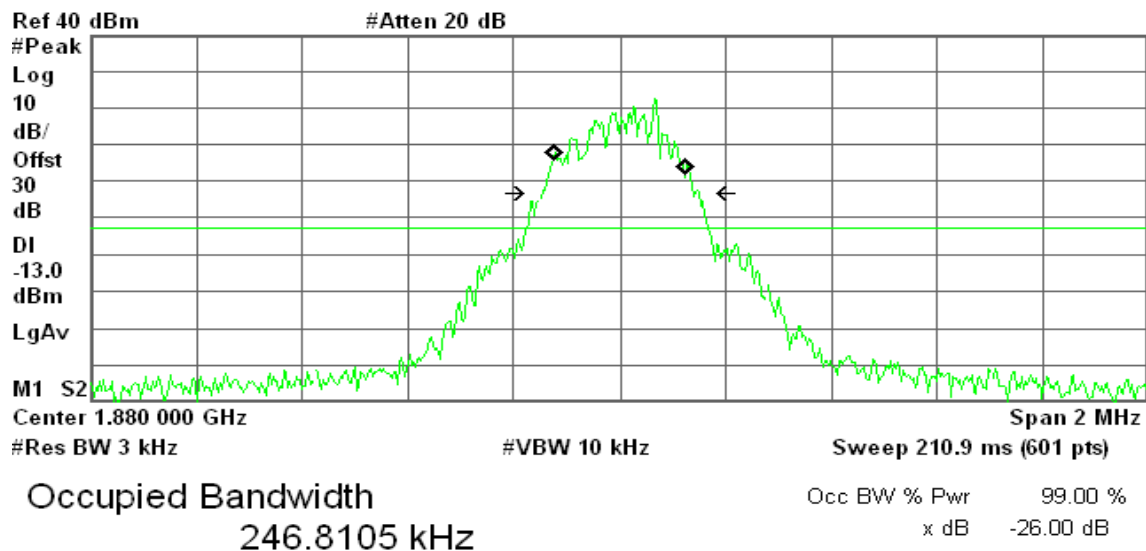


Transmit Freq Error -426.415 Hz  
x dB Bandwidth 303.098 kHz

## GSM 1900 (CH Mid)

Agilent 15:01:07 Sep 3, 2010

R T



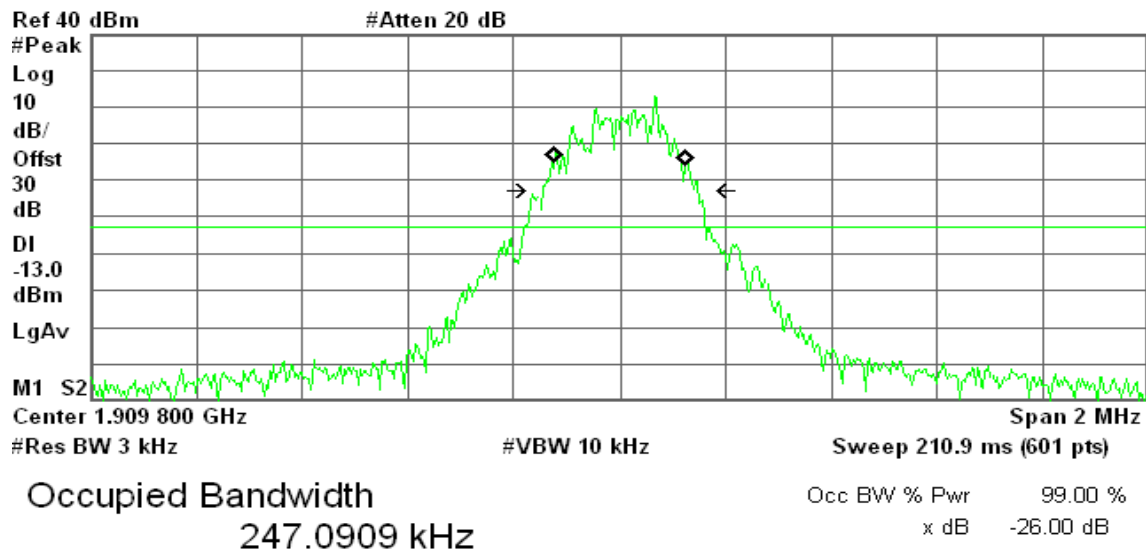
Transmit Freq Error -984.056 Hz  
x dB Bandwidth 295.974 kHz



## GSM 1900 (CH High)

Agilent 15:00:42 Sep 3, 2010

R T

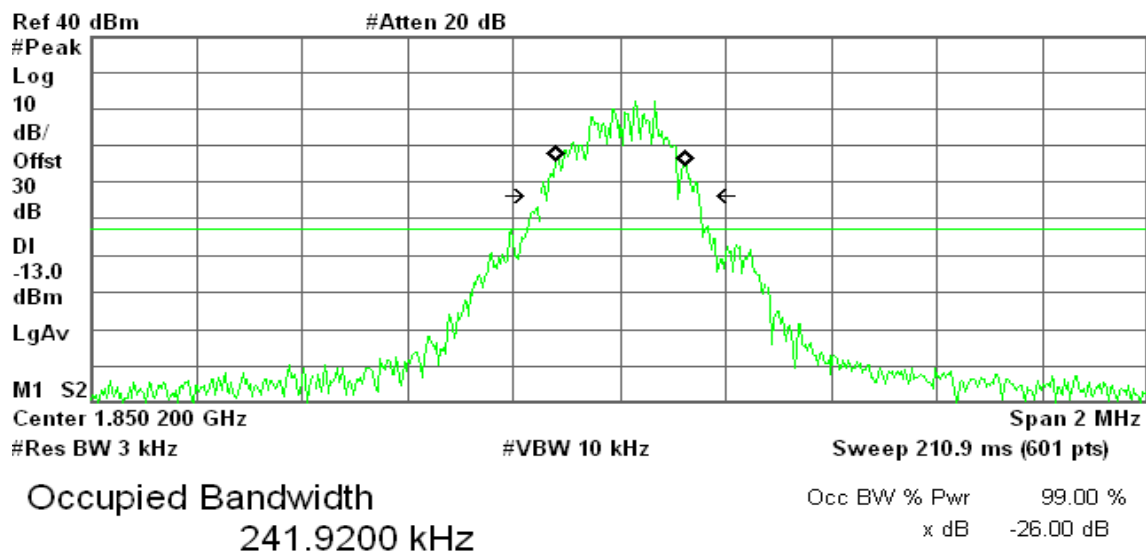


Transmit Freq Error 1.250 kHz  
x dB Bandwidth 293.229 kHz

## GPRS 1900 (CH Low)

Agilent 13:59:17 Sep 3, 2010

R T



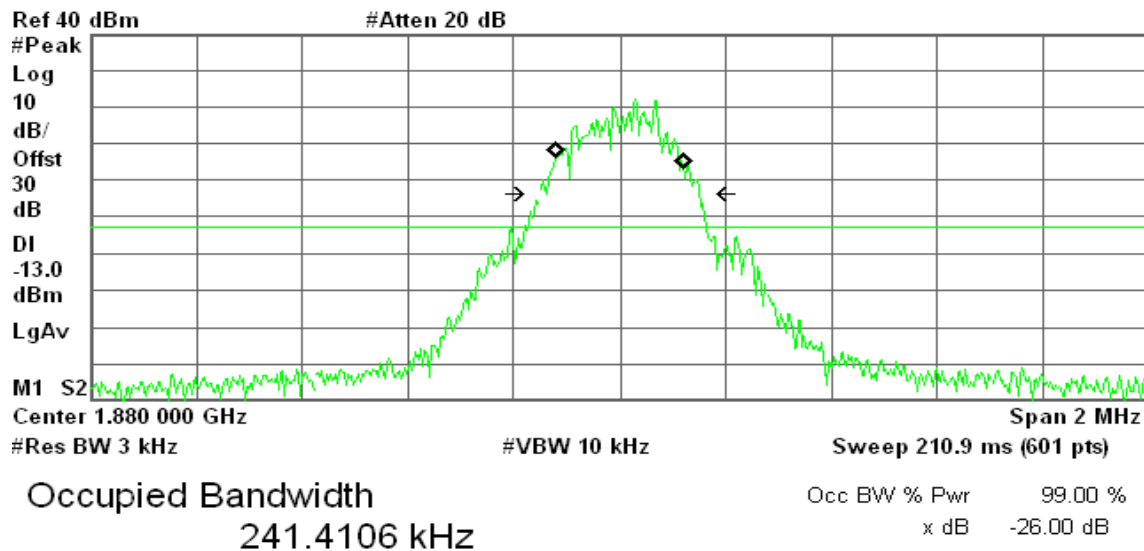
Transmit Freq Error 1.361 kHz  
x dB Bandwidth 296.765 kHz



## GPRS 1900 (CH Mid)

Agilent 13:59:48 Sep 3, 2010

R T

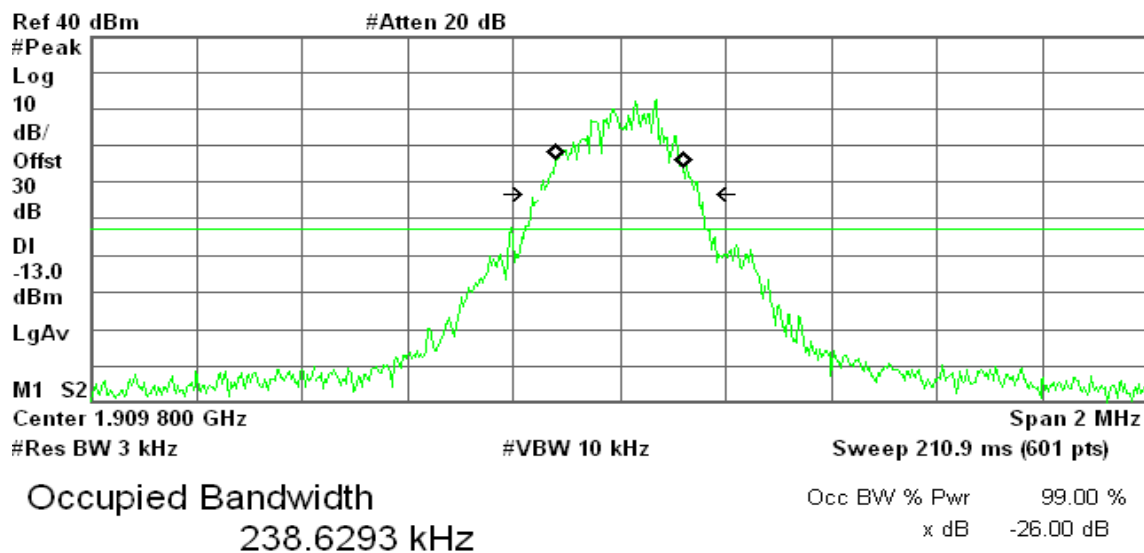


Transmit Freq Error 575.920 Hz  
x dB Bandwidth 299.713 kHz

## GPRS 1900 (CH High)

Agilent 14:00:18 Sep 3, 2010

R T



Transmit Freq Error -455.529 Hz  
x dB Bandwidth 297.792 kHz



## 7.5 OUT OF BAND EMISSION AT ANTENNA TERMINALS

### LIMIT

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

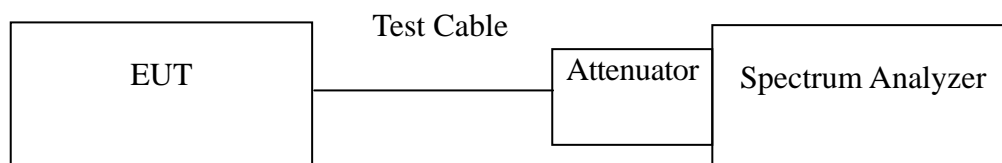
**Out of Band Emissions:** The mean power of emission must be attenuated below the mean power of the non-modulated carrier (P) on any frequency twice or more than twice the fundamental frequency by at least  $43 + 10 \log P$  dB.

**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

Agilent 14:43:29 Sep 3, 2010

R T

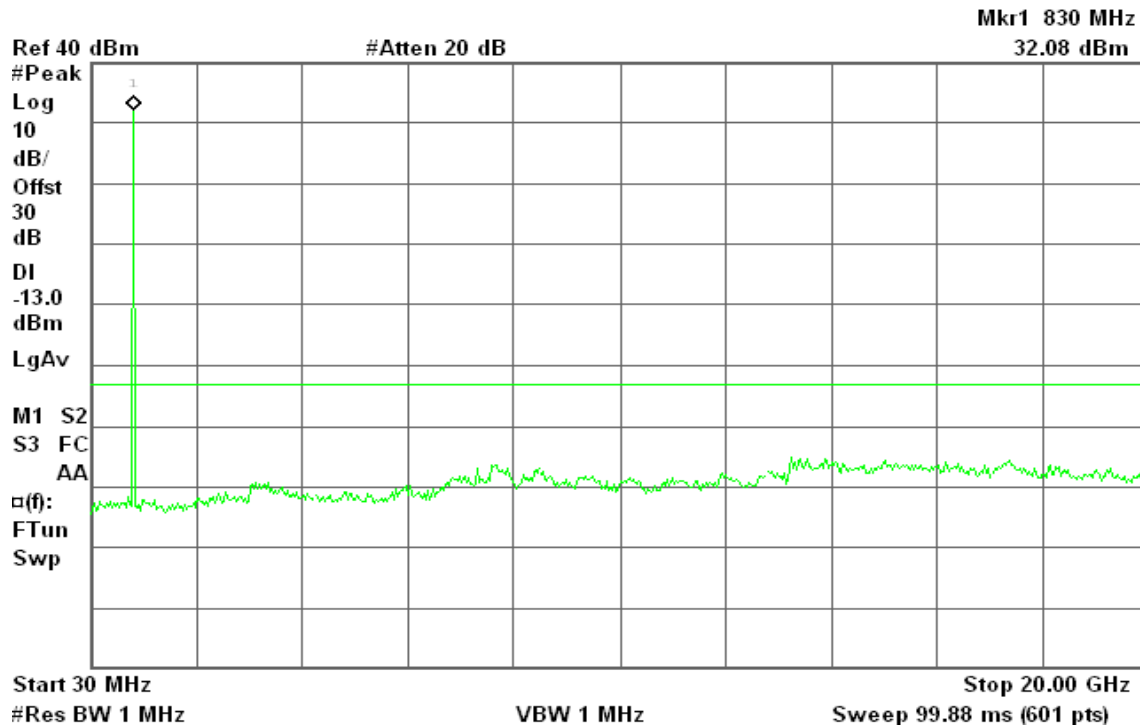


Figure 7-2: Out of Band emission at antenna terminals – GSM CH Mid

Agilent 14:43:50 Sep 3, 2010

R T

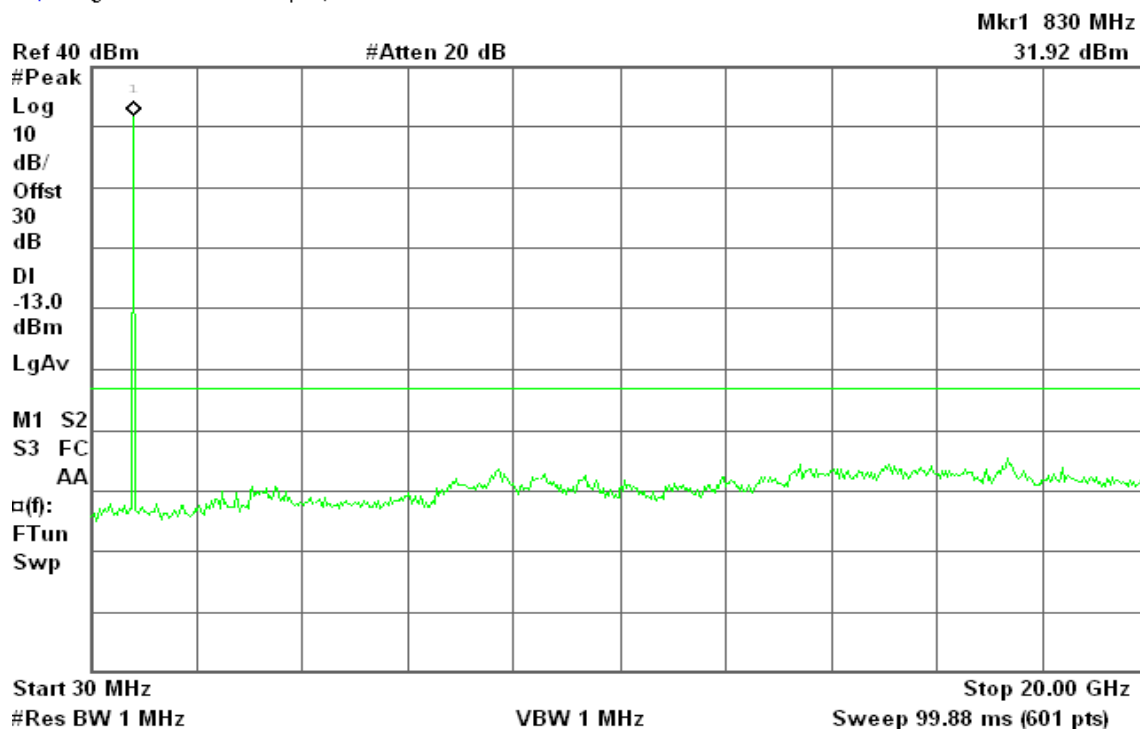
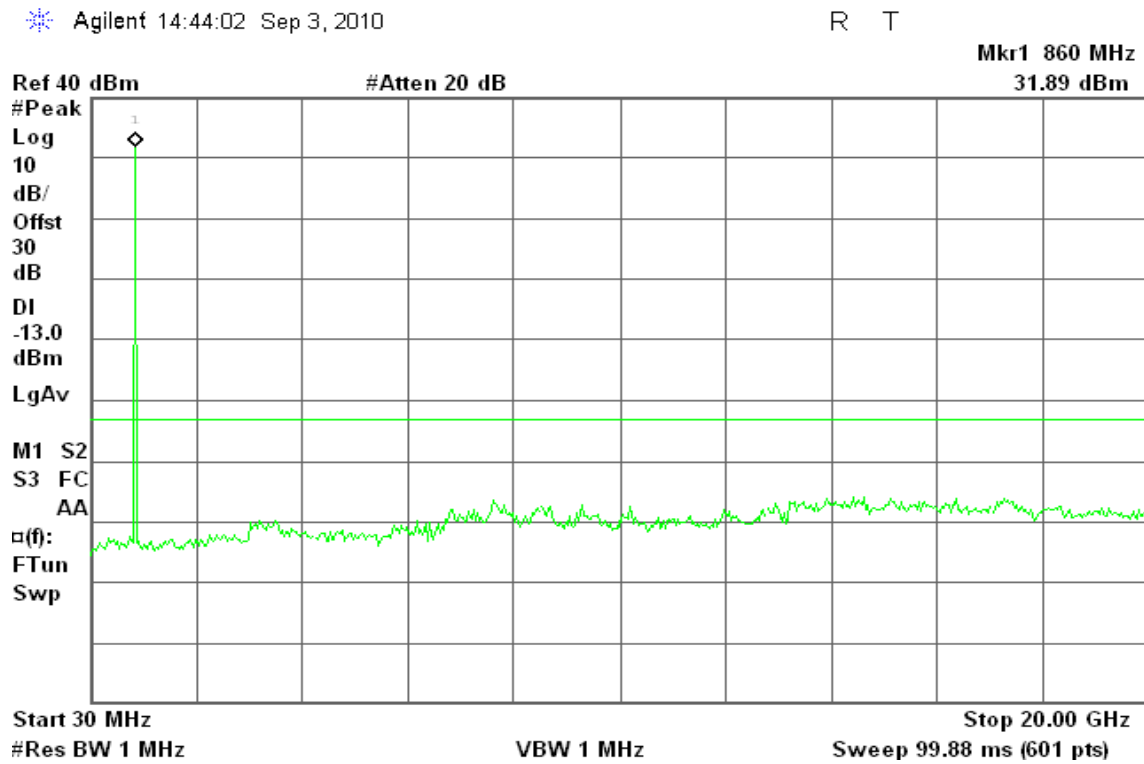




Figure 7-3: Out of Band emission at antenna terminals – GSM CH High



## GPRS 850

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

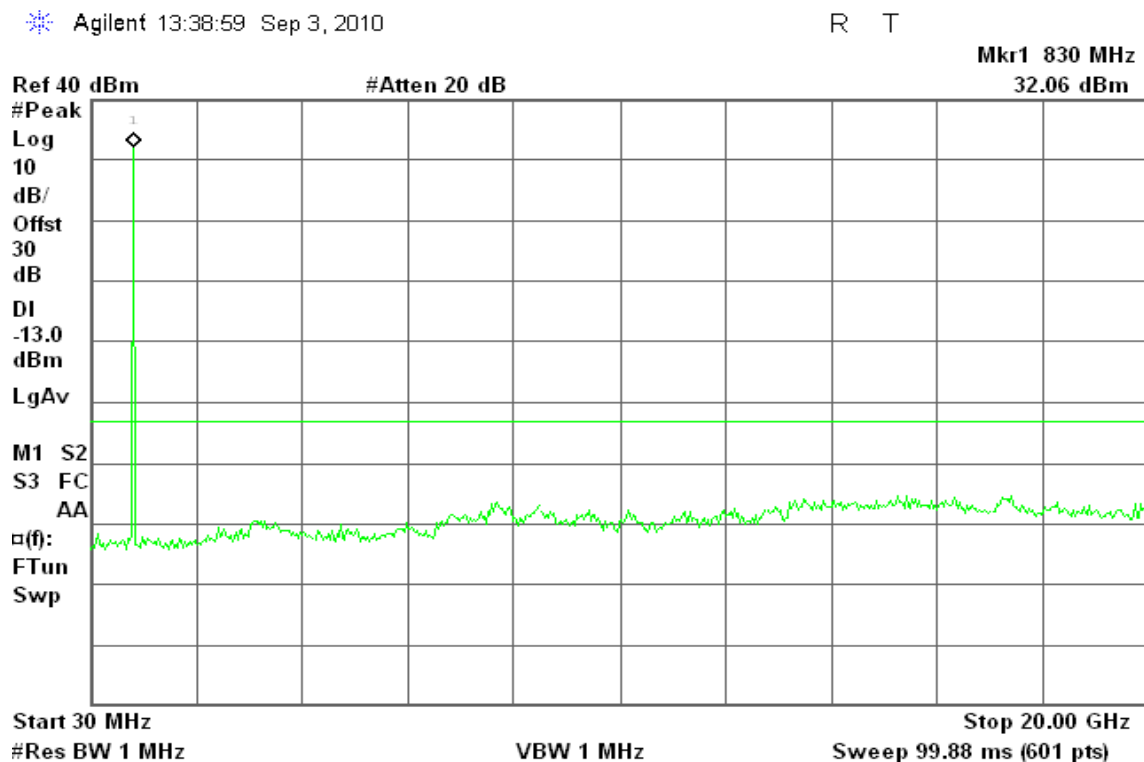






Figure 8-2: Out of Band emission at antenna terminals – GPRS CH Mid

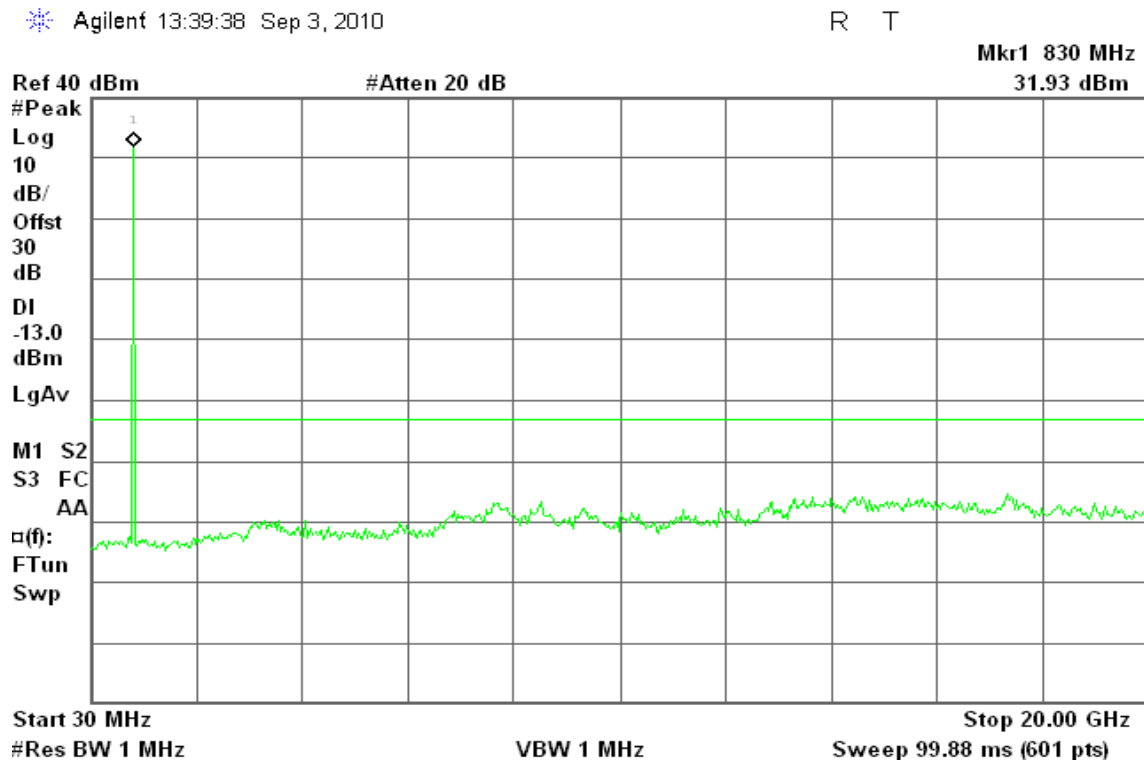
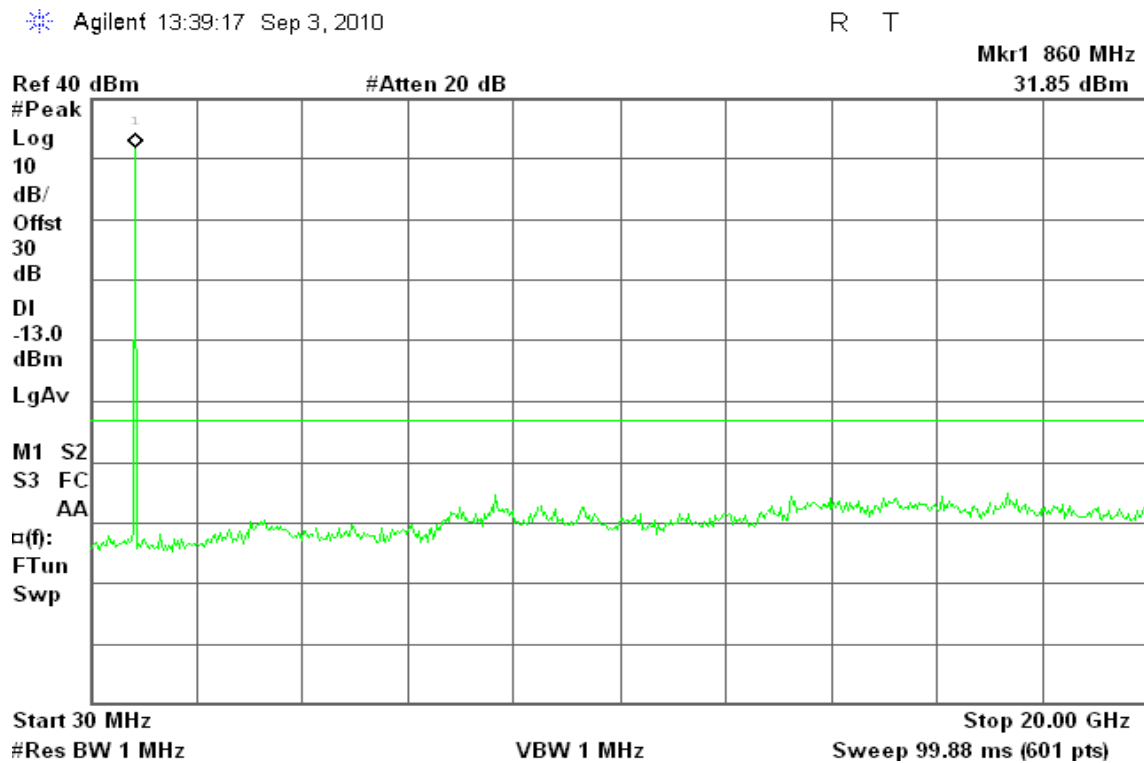


Figure 8-3: Out of Band emission at antenna terminals – GPRS CH High





## GSM 1900

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

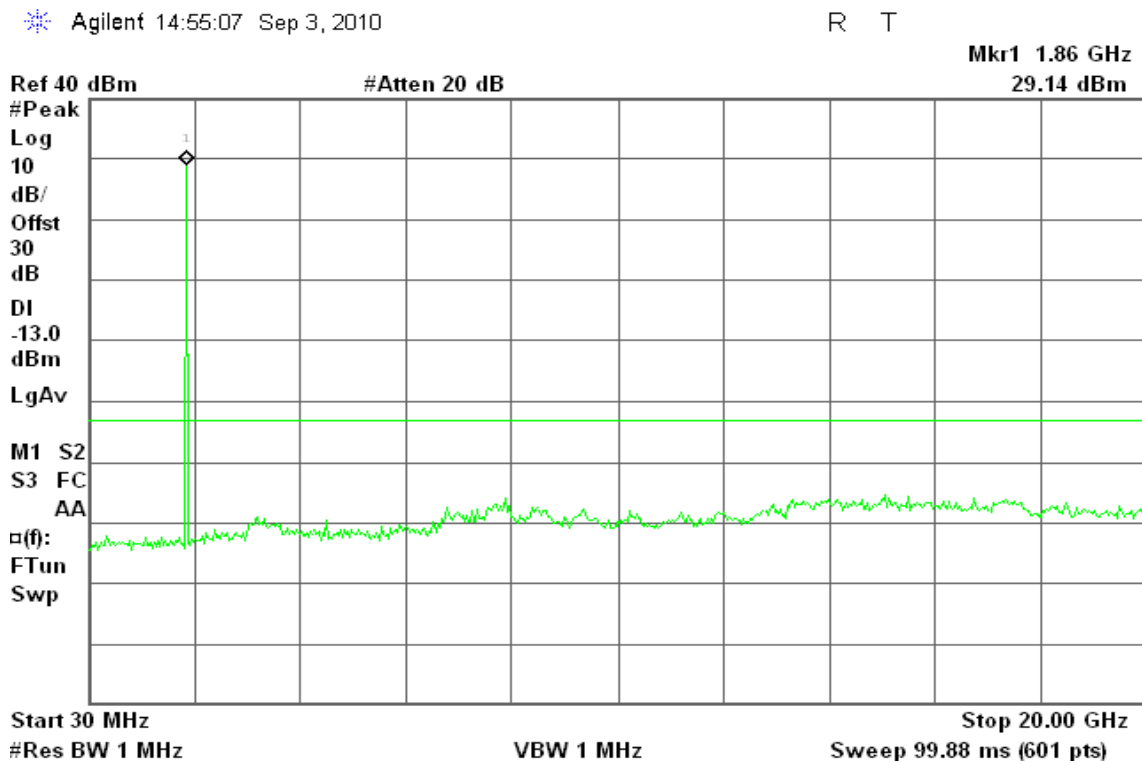


Figure 9-2: Out of Band emission at antenna terminals – GSM CH Mid

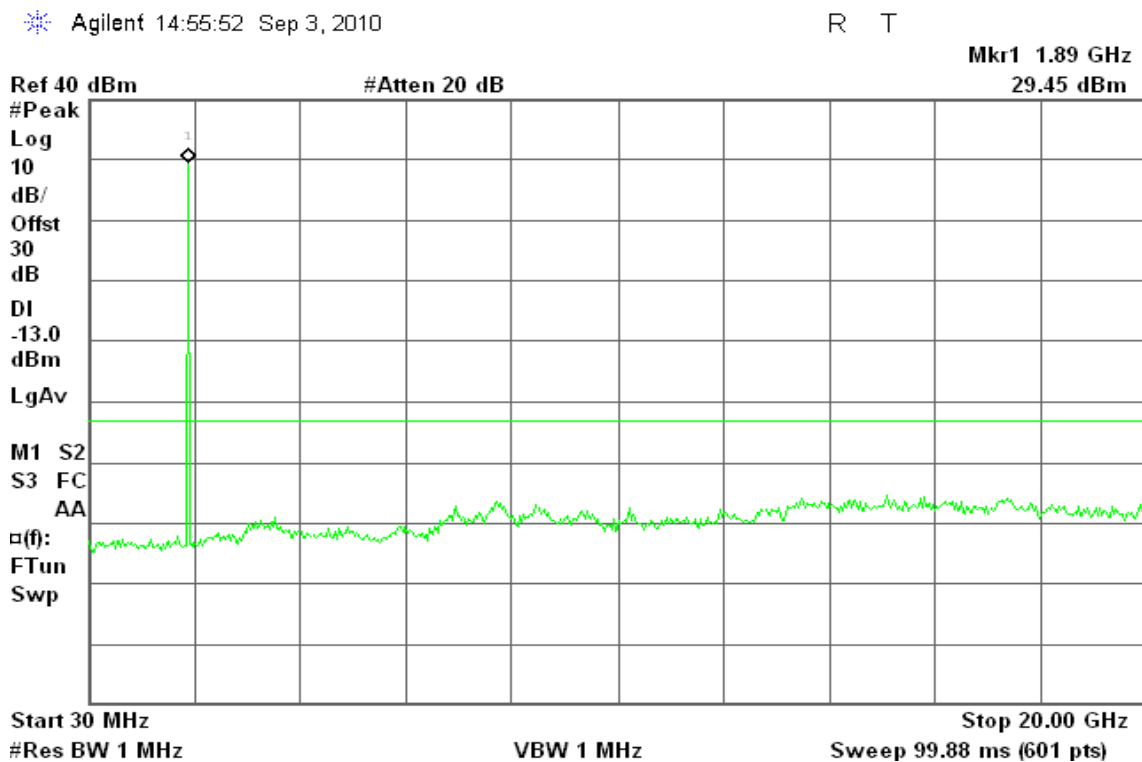
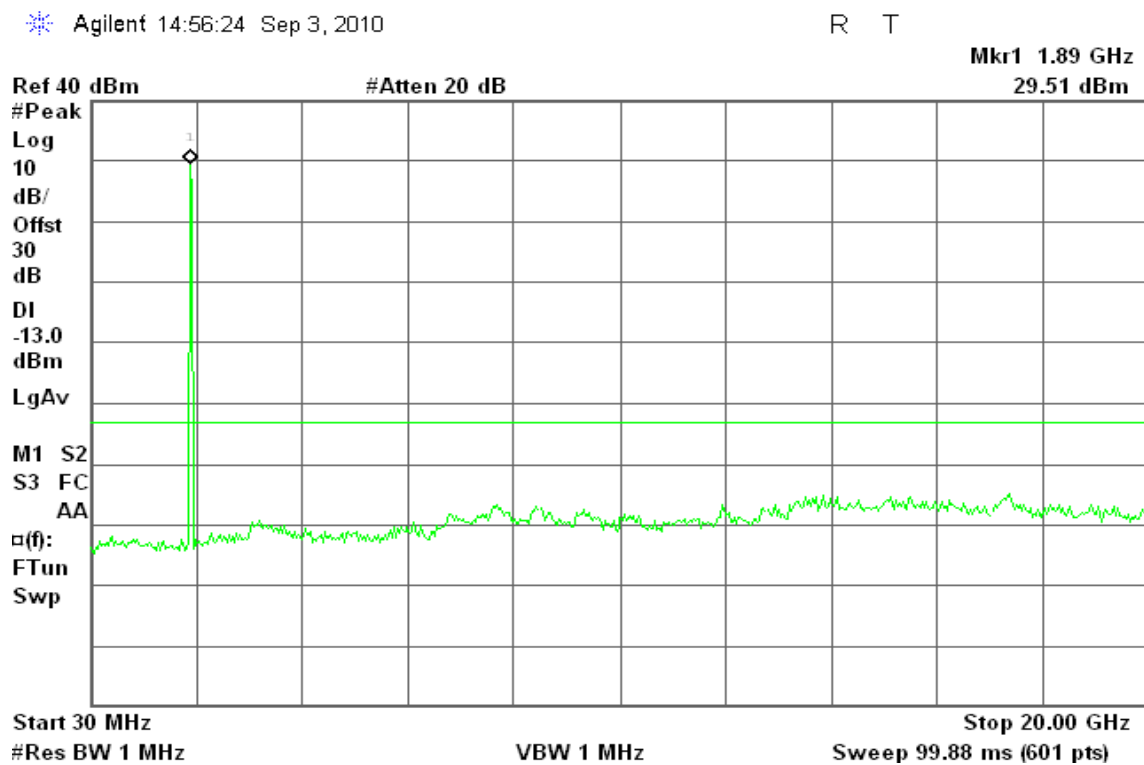




Figure 9-3: Out of Band emission at antenna terminals – GSM CH High



## GPRS 1900

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

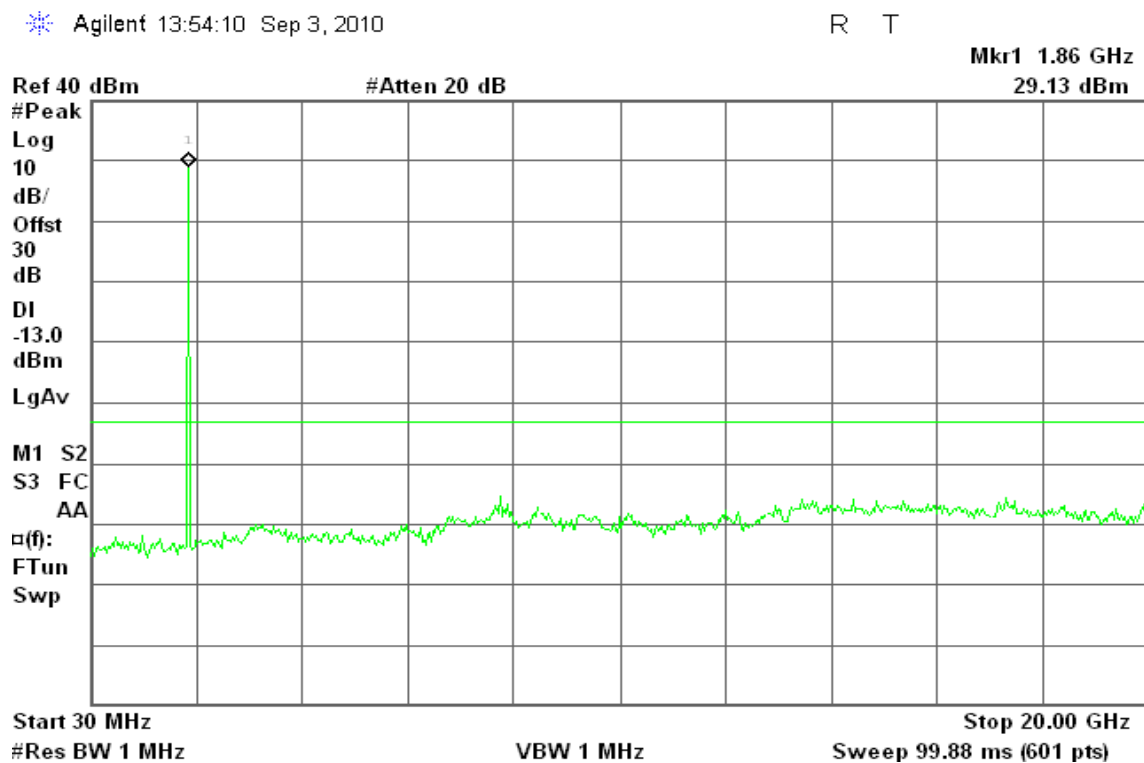




Figure 10-2: Out of Band emission at antenna terminals –GPRS CH Mid

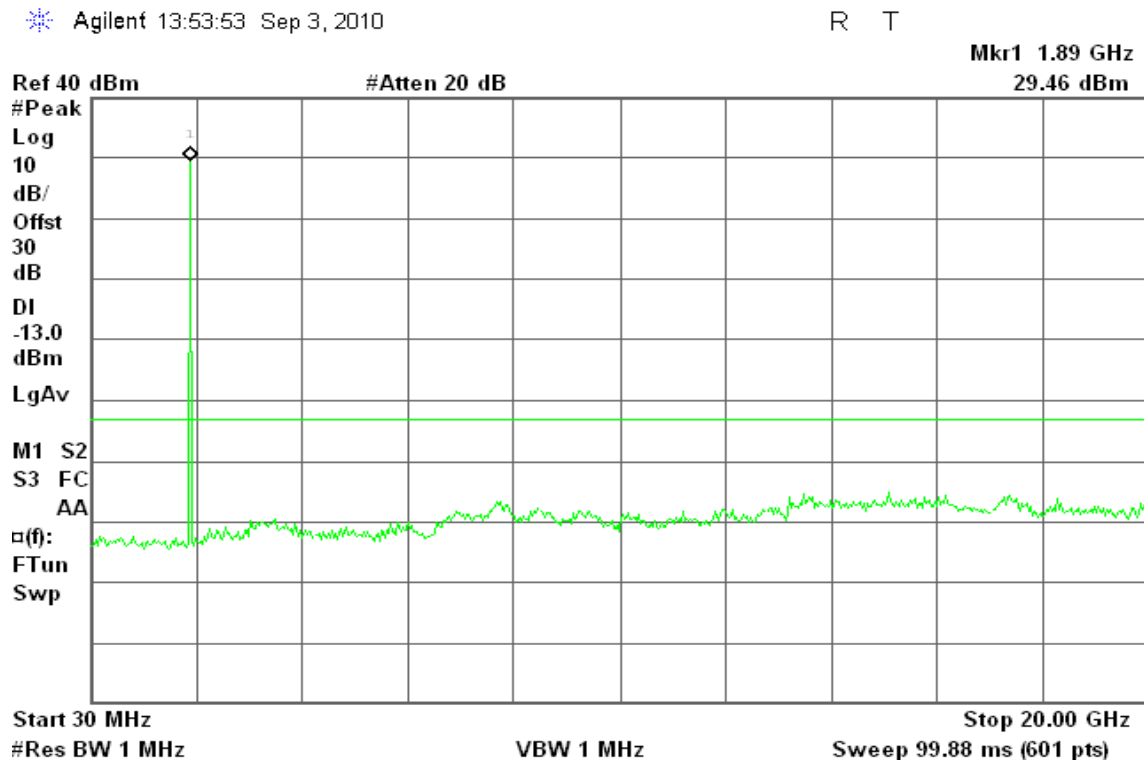
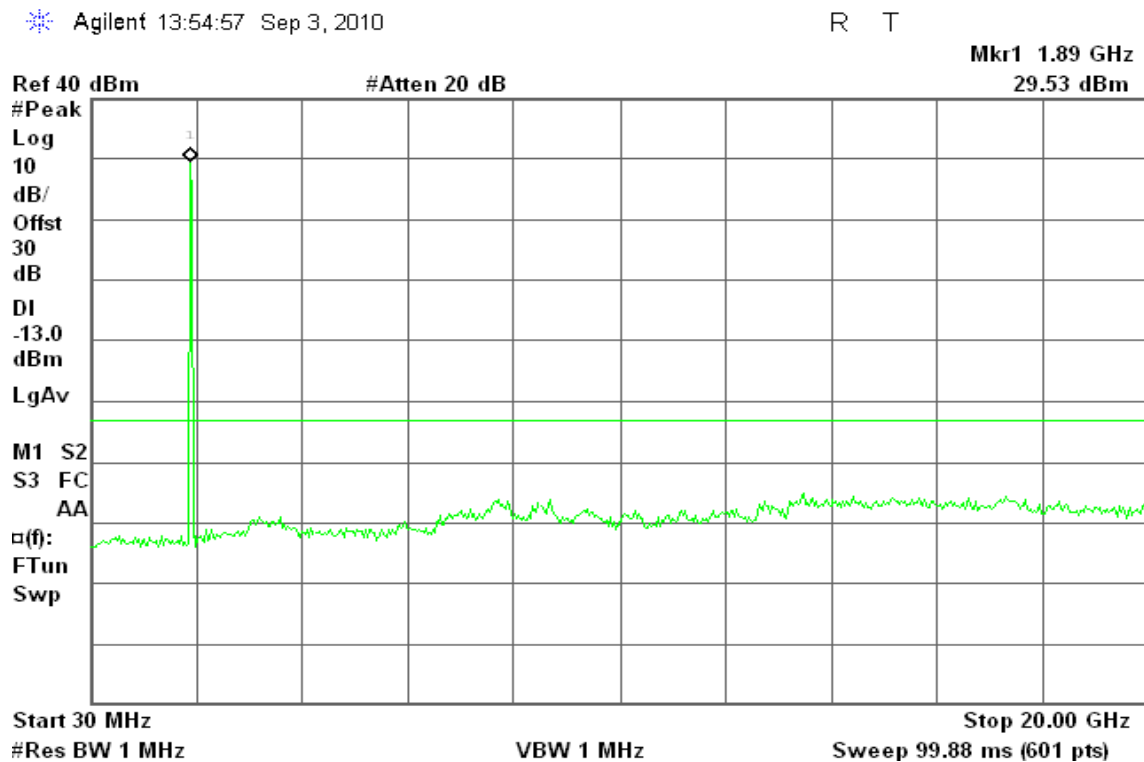


Figure 10-3: Out of Band emission at antenna terminals –GPRS CH High





## GSM 850

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

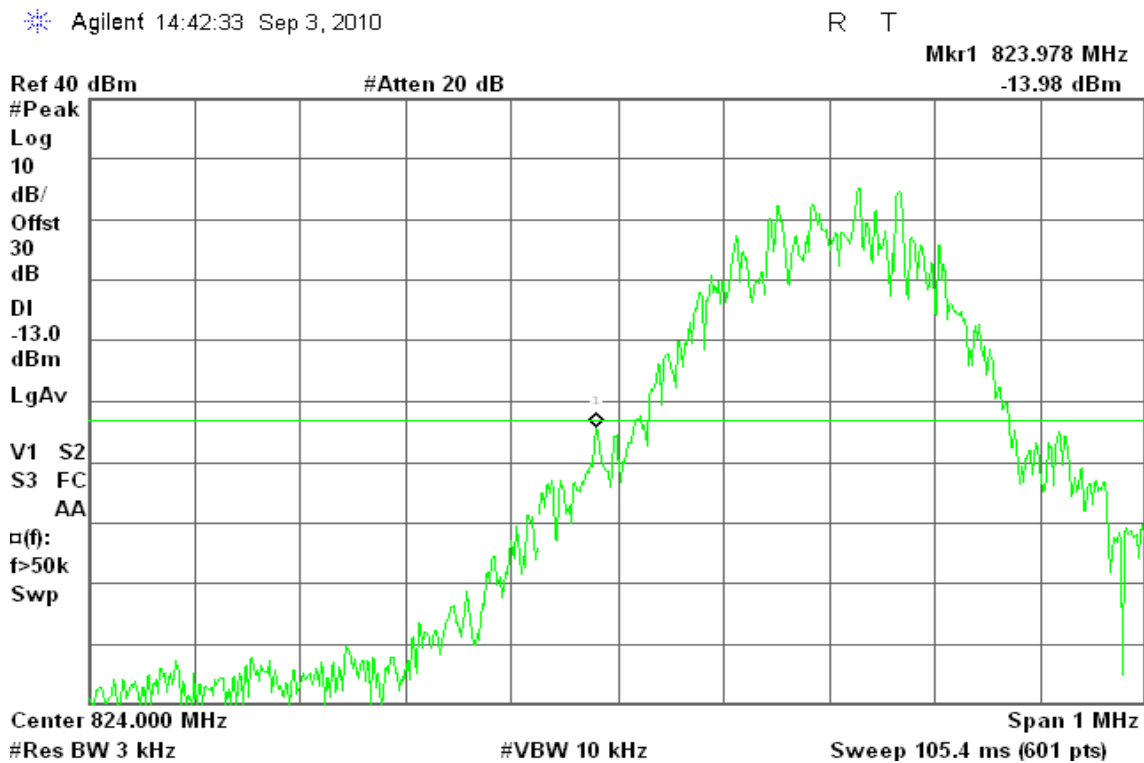
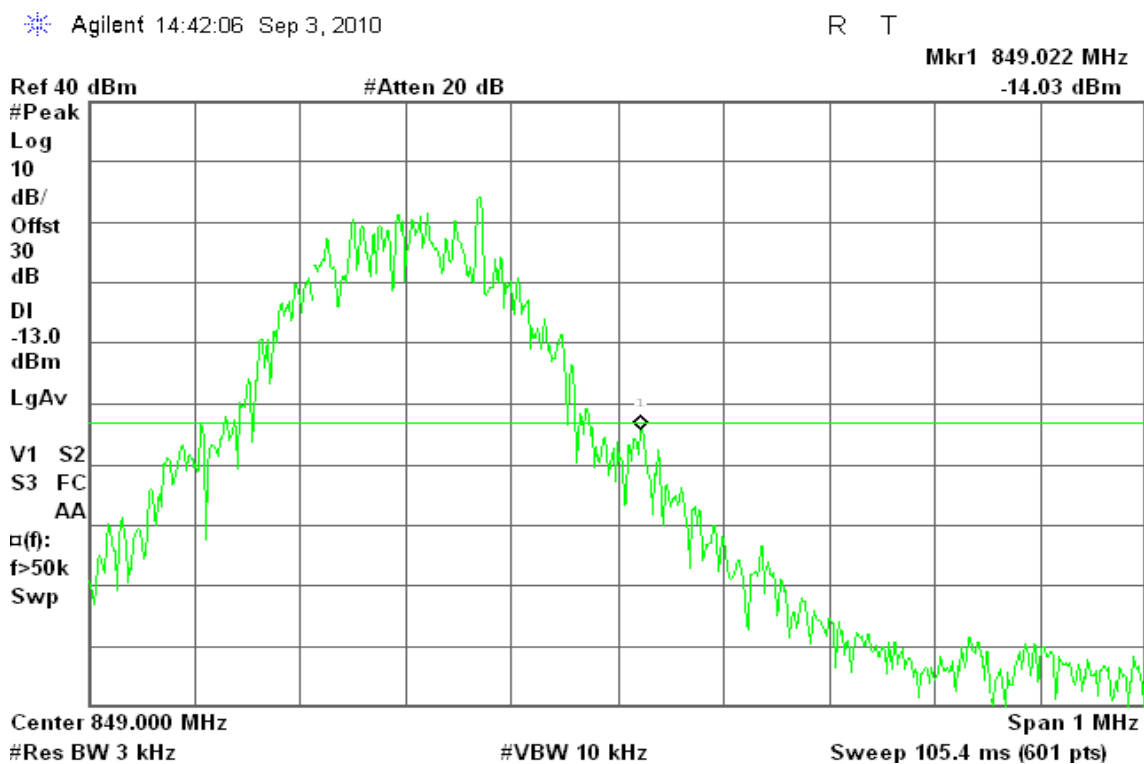


Figure 11-2: Band Edge emissions – GSM CH High





## GPRS 850

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

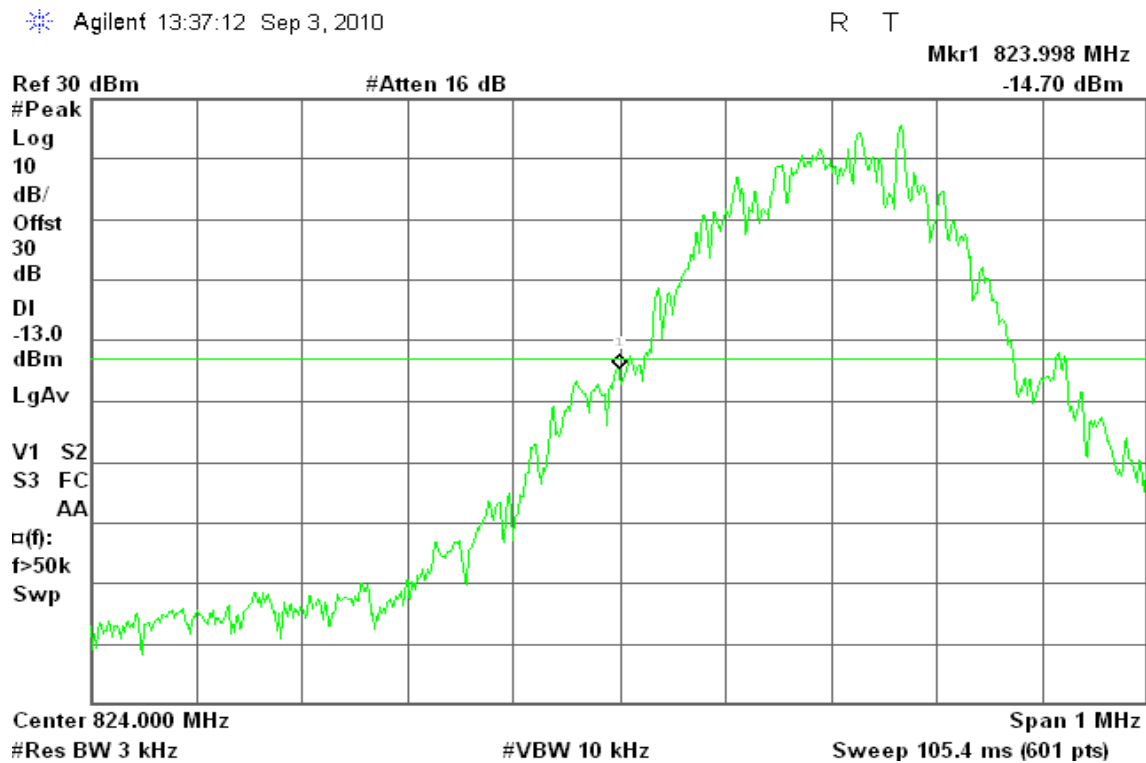
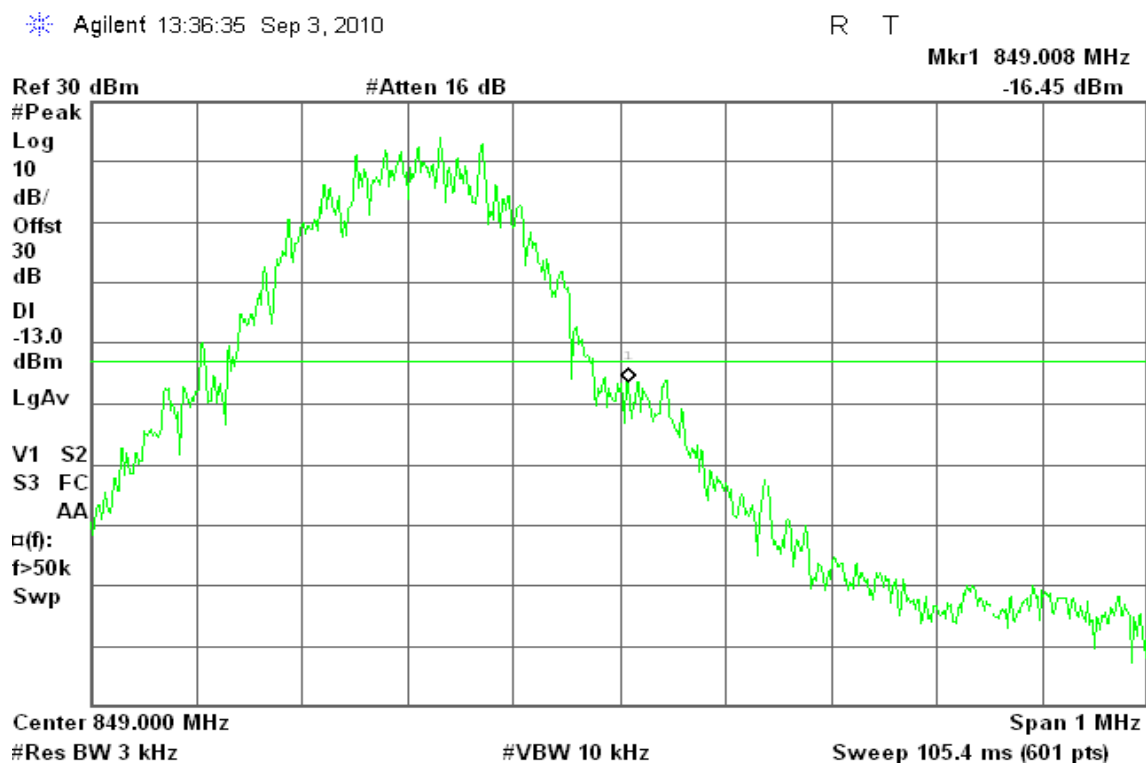


Figure 12-2: Band Edge emissions –GPRS CH High





## GSM 1900

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

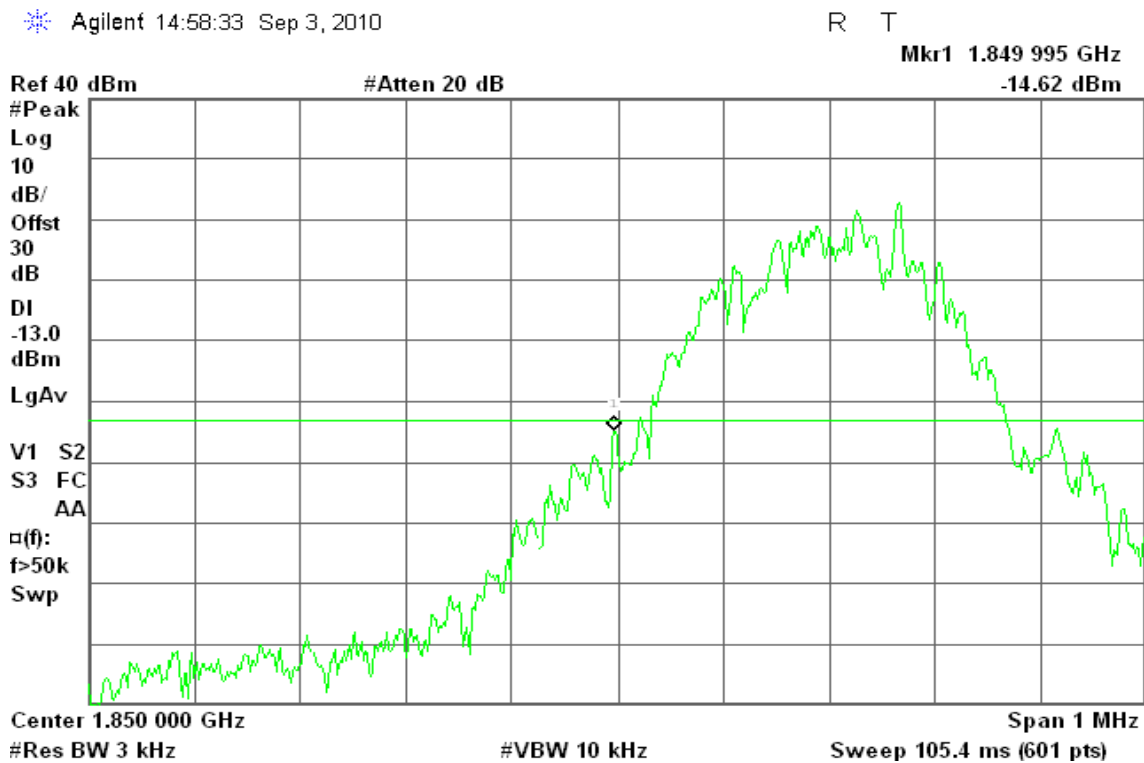
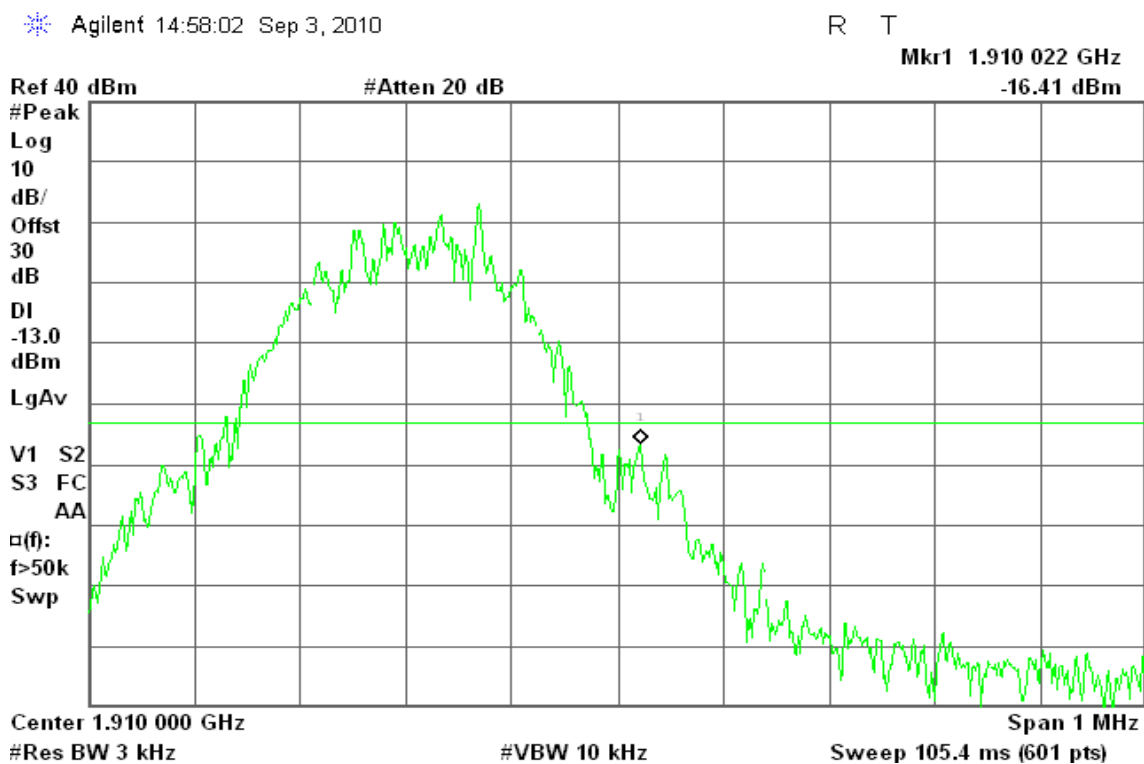


Figure 13-2: Band Edge emissions – GSM CH High





## GPRS 1900

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

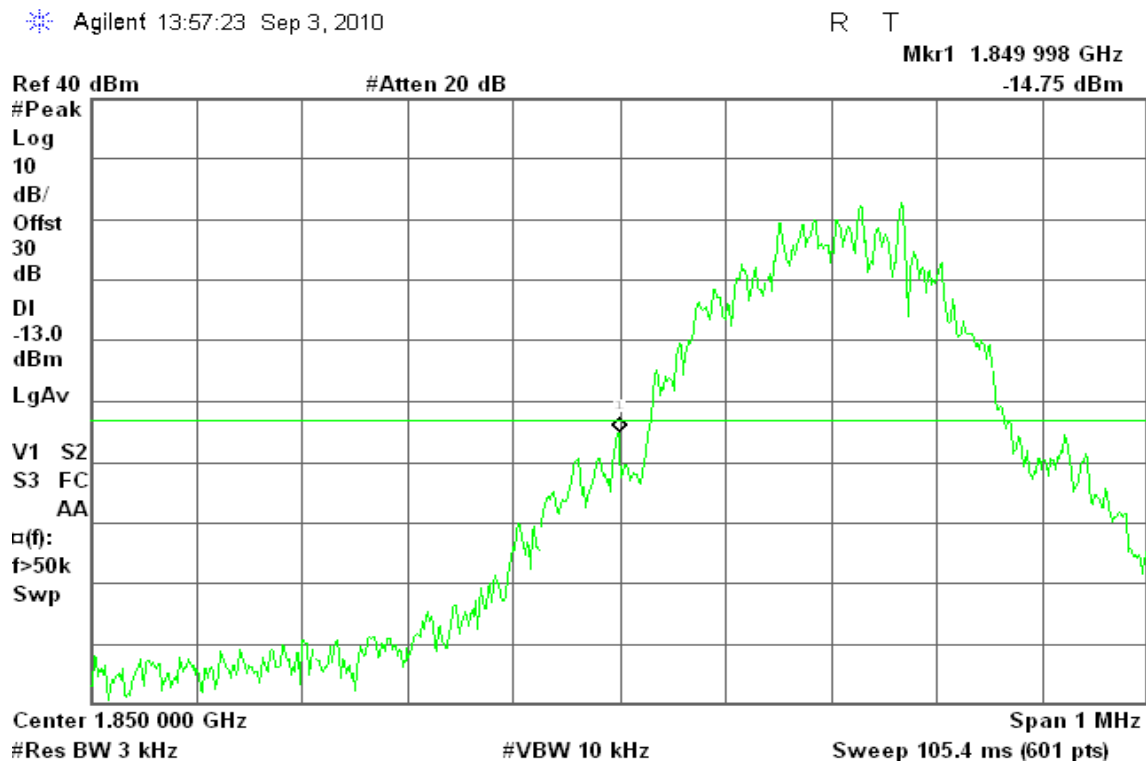
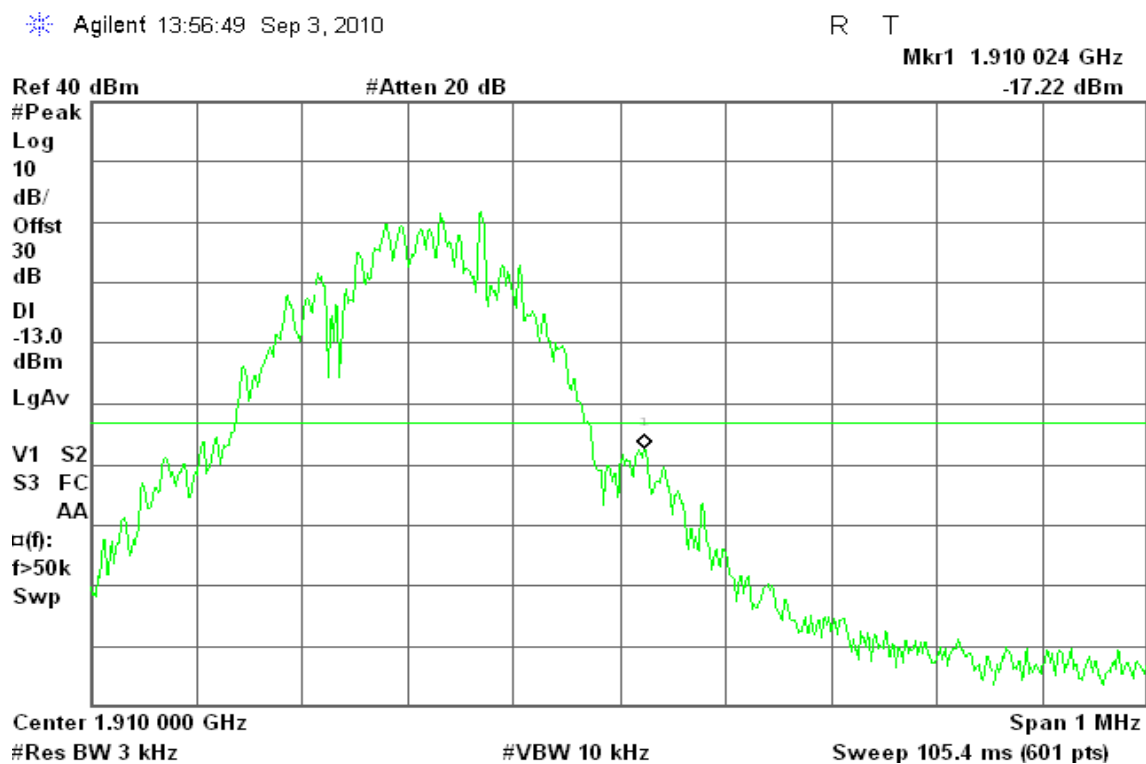


Figure 14-2: Band Edge emissions – GPRS CH High







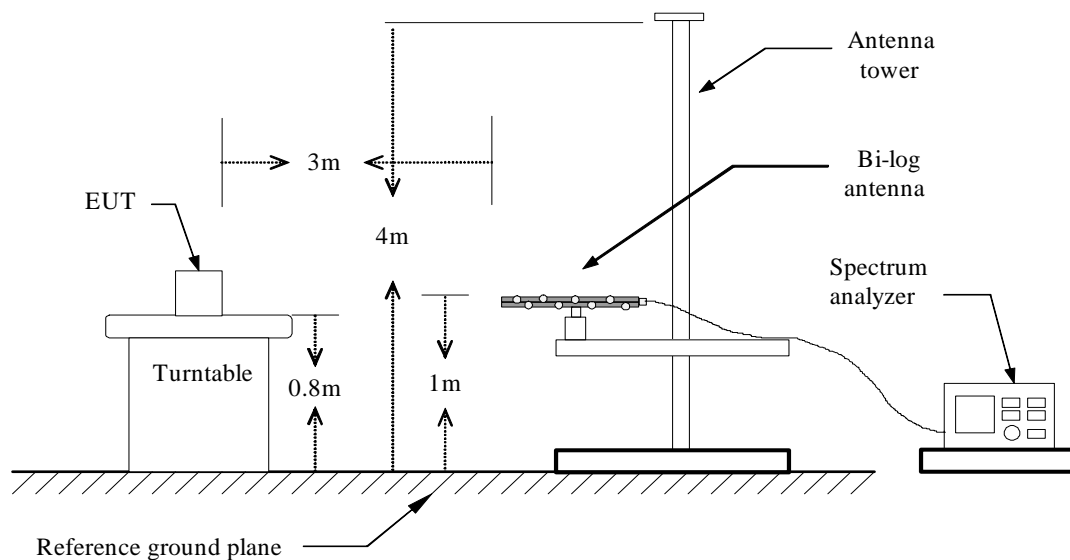
## 7.6 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

### LIMIT

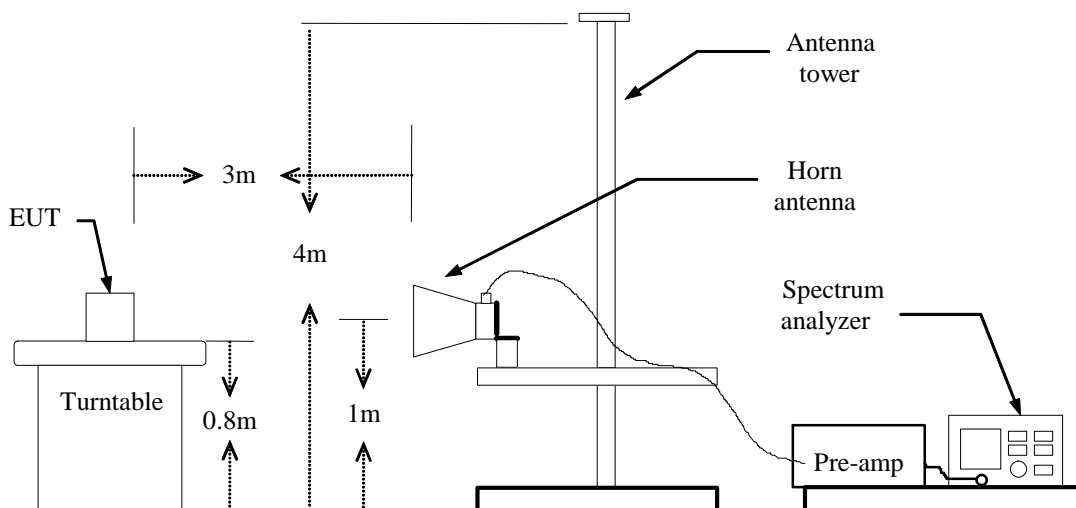
According to FCC §2.1053

### Test Configuration

#### Below 1 GHz

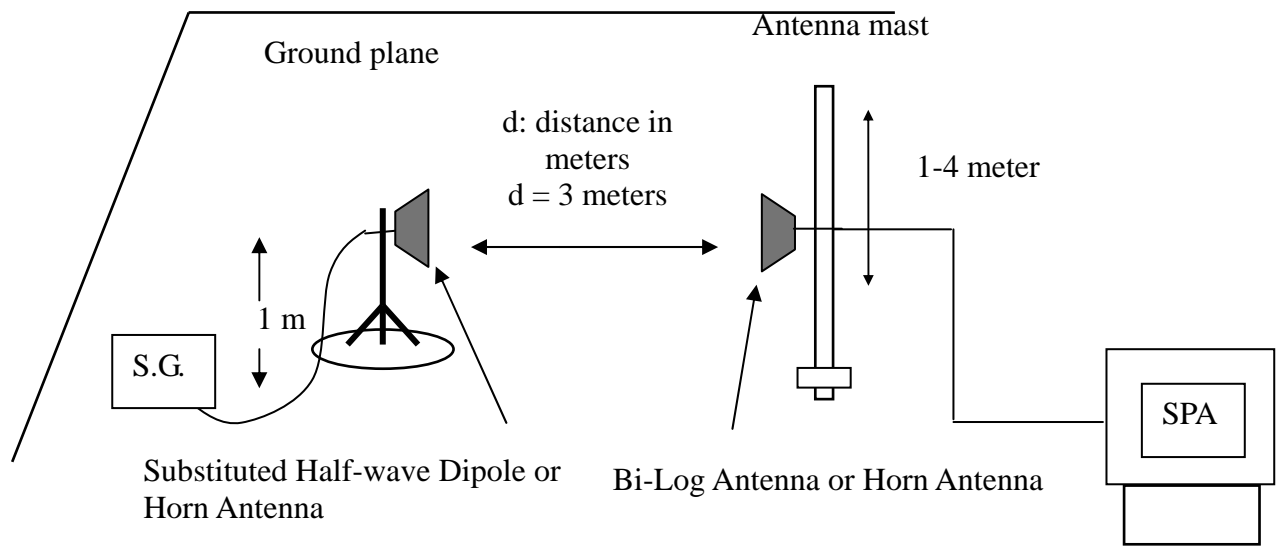


#### Above 1 GHz





## 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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % 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                          | -42.81        | -12.78                 | -55.60               | -13.00      | -42.60      |
| 72.68           | V                          | -37.86        | -16.10                 | -53.96               | -13.00      | -40.96      |
| 148.34          | V                          | -46.12        | -11.90                 | -58.03               | -13.00      | -45.03      |
| 231.76          | V                          | -46.32        | -13.94                 | -60.26               | -13.00      | -47.26      |
| 408.30          | V                          | -52.50        | -10.19                 | -62.69               | -13.00      | -49.69      |
| 682.81          | V                          | -59.14        | -5.87                  | -65.01               | -13.00      | -52.01      |
| 73.65           | H                          | -35.60        | -18.80                 | -54.40               | -13.00      | -41.40      |
| 151.25          | H                          | -41.43        | -12.98                 | -54.42               | -13.00      | -41.42      |
| 232.73          | H                          | -45.95        | -14.87                 | -60.82               | -13.00      | -47.82      |
| 408.30          | H                          | -53.77        | -10.16                 | -63.93               | -13.00      | -50.93      |
| 512.09          | H                          | -58.13        | -7.78                  | -65.90               | -13.00      | -52.90      |
| 612.97          | H                          | -60.05        | -6.76                  | -66.81               | -13.00      | -53.81      |

**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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 72.68           | V                          | -37.26        | -16.10                 | -53.36               | -13.00      | -40.36      |
| 147.37          | V                          | -45.85        | -11.91                 | -57.76               | -13.00      | -44.76      |
| 230.79          | V                          | -46.63        | -14.00                 | -60.63               | -13.00      | -47.63      |
| 371.44          | V                          | -54.45        | -11.90                 | -66.34               | -13.00      | -53.34      |
| 452.92          | V                          | -55.78        | -9.04                  | -64.82               | -13.00      | -51.82      |
| 625.58          | V                          | -61.08        | -6.20                  | -67.28               | -13.00      | -54.28      |
| 73.65           | H                          | -35.70        | -18.80                 | -54.50               | -13.00      | -41.50      |
| 148.34          | H                          | -41.61        | -13.13                 | -54.74               | -13.00      | -41.74      |
| 161.92          | H                          | -42.77        | -13.27                 | -56.03               | -13.00      | -43.03      |
| 231.76          | H                          | -45.22        | -14.99                 | -60.21               | -13.00      | -47.21      |
| 381.14          | H                          | -55.54        | -11.35                 | -66.89               | -13.00      | -53.89      |
| 612.97          | H                          | -61.03        | -6.76                  | -67.79               | -13.00      | -54.79      |

**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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % 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                          | -42.62        | -12.78                 | -55.40               | -13.00      | -42.40      |
| 72.68           | V                          | -38.28        | -16.10                 | -54.38               | -13.00      | -41.38      |
| 149.31          | V                          | -46.51        | -11.90                 | -58.41               | -13.00      | -45.41      |
| 229.82          | V                          | -46.78        | -14.07                 | -60.85               | -13.00      | -47.85      |
| 288.99          | V                          | -52.46        | -11.40                 | -63.86               | -13.00      | -50.86      |
| 384.05          | V                          | -55.11        | -11.57                 | -66.68               | -13.00      | -53.68      |
| 43.58           | H                          | -55.64        | -11.53                 | -67.18               | -13.00      | -54.18      |
| 72.68           | H                          | -48.04        | -18.50                 | -66.54               | -13.00      | -53.54      |
| 149.31          | H                          | -46.72        | -13.01                 | -59.73               | -13.00      | -46.73      |
| 180.35          | H                          | -51.39        | -12.66                 | -64.05               | -13.00      | -51.05      |
| 370.47          | H                          | -58.63        | -11.75                 | -70.38               | -13.00      | -57.38      |
| 521.79          | H                          | -61.67        | -7.81                  | -69.48               | -13.00      | -56.48      |

**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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % 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                          | -43.44        | -12.94                 | -56.38               | -13.00      | -43.38      |
| 73.65           | V                          | -37.69        | -16.51                 | -54.19               | -13.00      | -41.19      |
| 147.37          | V                          | -45.58        | -11.91                 | -57.49               | -13.00      | -44.49      |
| 231.76          | V                          | -45.94        | -13.94                 | -59.87               | -13.00      | -46.87      |
| 383.08          | V                          | -53.96        | -11.63                 | -65.59               | -13.00      | -52.59      |
| 408.30          | V                          | -52.28        | -10.19                 | -62.47               | -13.00      | -49.47      |
| 73.65           | H                          | -35.66        | -18.80                 | -54.46               | -13.00      | -41.46      |
| 151.25          | H                          | -41.08        | -12.98                 | -54.06               | -13.00      | -41.06      |
| 163.86          | H                          | -43.62        | -13.10                 | -56.72               | -13.00      | -43.72      |
| 229.82          | H                          | -44.99        | -15.18                 | -60.18               | -13.00      | -47.18      |
| 282.20          | H                          | -52.88        | -12.65                 | -65.53               | -13.00      | -52.53      |
| 408.30          | H                          | -53.05        | -10.16                 | -63.21               | -13.00      | -50.21      |

**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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % 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                          | -43.27        | -12.94                 | -56.21               | -13.00      | -43.21      |
| 72.68           | V                          | -37.76        | -16.10                 | -53.86               | -13.00      | -40.86      |
| 148.34          | V                          | -46.43        | -11.90                 | -58.33               | -13.00      | -45.33      |
| 233.70          | V                          | -47.27        | -13.80                 | -61.06               | -13.00      | -48.06      |
| 383.08          | V                          | -54.65        | -11.63                 | -66.28               | -13.00      | -53.28      |
| 452.92          | V                          | -56.52        | -9.04                  | -65.56               | -13.00      | -52.56      |
| 73.65           | H                          | -35.79        | -18.80                 | -54.59               | -13.00      | -41.59      |
| 148.34          | H                          | -40.86        | -13.13                 | -53.99               | -13.00      | -40.99      |
| 191.99          | H                          | -45.83        | -13.25                 | -59.08               | -13.00      | -46.08      |
| 231.76          | H                          | -45.30        | -14.99                 | -60.29               | -13.00      | -47.29      |
| 378.23          | H                          | -53.91        | -11.47                 | -65.38               | -13.00      | -52.38      |
| 452.92          | H                          | -57.98        | -9.00                  | -66.98               | -13.00      | -53.98      |

**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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % 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                          | -43.46        | -12.94                 | -56.39               | -13.00      | -43.39      |
| 73.65           | V                          | -37.90        | -16.51                 | -54.40               | -13.00      | -41.40      |
| 150.28          | V                          | -46.90        | -11.94                 | -58.84               | -13.00      | -45.84      |
| 231.76          | V                          | -45.83        | -13.94                 | -59.76               | -13.00      | -46.76      |
| 369.50          | V                          | -54.15        | -11.91                 | -66.06               | -13.00      | -53.06      |
| 553.80          | V                          | -61.03        | -7.35                  | -68.38               | -13.00      | -55.38      |
| 73.65           | H                          | -35.60        | -18.80                 | -54.40               | -13.00      | -41.40      |
| 150.28          | H                          | -40.96        | -12.93                 | -53.89               | -13.00      | -40.89      |
| 231.76          | H                          | -45.39        | -14.99                 | -60.37               | -13.00      | -47.37      |
| 373.38          | H                          | -54.38        | -11.65                 | -66.03               | -13.00      | -53.03      |
| 509.18          | H                          | -61.93        | -7.76                  | -69.70               | -13.00      | -56.70      |
| 648.86          | H                          | -61.78        | -5.86                  | -67.65               | -13.00      | -54.65      |

**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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 44.55           | V                          | -43.38        | -12.63                 | -56.01               | -13.00      | -43.01      |
| 72.68           | V                          | -37.79        | -16.10                 | -53.89               | -13.00      | -40.89      |
| 147.37          | V                          | -46.52        | -11.91                 | -58.43               | -13.00      | -45.43      |
| 229.82          | V                          | -46.44        | -14.07                 | -60.51               | -13.00      | -47.51      |
| 385.99          | V                          | -55.27        | -11.45                 | -66.73               | -13.00      | -53.73      |
| 612.97          | V                          | -61.82        | -6.54                  | -68.36               | -13.00      | -55.36      |
| 73.65           | H                          | -36.18        | -18.80                 | -54.98               | -13.00      | -41.98      |
| 151.25          | H                          | -40.76        | -12.98                 | -53.74               | -13.00      | -40.74      |
| 231.76          | H                          | -45.36        | -14.99                 | -60.35               | -13.00      | -47.35      |
| 378.23          | H                          | -54.60        | -11.47                 | -66.07               | -13.00      | -53.07      |
| 563.50          | H                          | -61.00        | -7.23                  | -68.23               | -13.00      | -55.23      |
| 767.20          | H                          | -62.19        | -4.70                  | -66.89               | -13.00      | -53.89      |

**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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % 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                          | -42.81        | -12.78                 | -55.59               | -13.00      | -42.59      |
| 73.65           | V                          | -37.91        | -16.51                 | -54.42               | -13.00      | -41.42      |
| 147.37          | V                          | -46.88        | -11.91                 | -58.79               | -13.00      | -45.79      |
| 231.76          | V                          | -46.23        | -13.94                 | -60.17               | -13.00      | -47.17      |
| 288.02          | V                          | -52.08        | -11.51                 | -63.59               | -13.00      | -50.59      |
| 385.02          | V                          | -55.63        | -11.51                 | -67.15               | -13.00      | -54.15      |
| 73.65           | H                          | -35.77        | -18.80                 | -54.57               | -13.00      | -41.57      |
| 151.25          | H                          | -40.84        | -12.98                 | -53.82               | -13.00      | -40.82      |
| 230.79          | H                          | -45.12        | -15.10                 | -60.22               | -13.00      | -47.22      |
| 385.02          | H                          | -55.43        | -11.17                 | -66.60               | -13.00      | -53.60      |
| 450.01          | H                          | -60.49        | -9.05                  | -69.54               | -13.00      | -56.54      |
| 630.43          | H                          | -62.17        | -6.21                  | -68.38               | -13.00      | -55.38      |

**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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % 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                          | -43.23        | -12.78                 | -56.01               | -13.00      | -43.01      |
| 73.65           | V                          | -37.45        | -16.51                 | -53.96               | -13.00      | -40.96      |
| 88.20           | V                          | -40.19        | -20.62                 | -60.81               | -13.00      | -47.81      |
| 148.34          | V                          | -47.25        | -11.90                 | -59.15               | -13.00      | -46.15      |
| 233.70          | V                          | -46.79        | -13.80                 | -60.59               | -13.00      | -47.59      |
| 343.31          | V                          | -54.55        | -12.59                 | -67.13               | -13.00      | -54.13      |
| 73.65           | H                          | -35.95        | -18.80                 | -54.75               | -13.00      | -41.75      |
| 151.25          | H                          | -41.11        | -12.98                 | -54.09               | -13.00      | -41.09      |
| 181.32          | H                          | -45.66        | -12.76                 | -58.42               | -13.00      | -45.42      |
| 230.79          | H                          | -45.34        | -15.10                 | -60.45               | -13.00      | -47.45      |
| 370.47          | H                          | -54.95        | -11.75                 | -66.70               | -13.00      | -53.70      |
| 497.54          | H                          | -61.59        | -7.80                  | -69.39               | -13.00      | -56.39      |

**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:** GPRS 1900 / TX / CH 512**Test Date:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 44.55           | V                          | -42.77        | -12.63                 | -55.41               | -13.00      | -42.41      |
| 72.68           | V                          | -37.92        | -16.10                 | -54.02               | -13.00      | -41.02      |
| 151.25          | V                          | -45.99        | -12.07                 | -58.07               | -13.00      | -45.07      |
| 231.76          | V                          | -46.43        | -13.94                 | -60.36               | -13.00      | -47.36      |
| 728.40          | V                          | -61.70        | -5.40                  | -67.10               | -13.00      | -54.10      |
| 806.97          | V                          | -60.18        | -4.28                  | -64.46               | -13.00      | -51.46      |
| 73.65           | H                          | -36.01        | -18.80                 | -54.81               | -13.00      | -41.81      |
| 150.28          | H                          | -41.11        | -12.93                 | -54.05               | -13.00      | -41.05      |
| 229.82          | H                          | -45.25        | -15.18                 | -60.43               | -13.00      | -47.43      |
| 364.65          | H                          | -54.64        | -11.95                 | -66.59               | -13.00      | -53.59      |
| 518.88          | H                          | -61.37        | -7.81                  | -69.18               | -13.00      | -56.18      |
| 694.45          | H                          | -61.49        | -5.92                  | -67.41               | -13.00      | -54.41      |

**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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % 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                          | -43.11        | -12.94                 | -56.05               | -13.00      | -43.05      |
| 73.65           | V                          | -37.58        | -16.51                 | -54.09               | -13.00      | -41.09      |
| 149.31          | V                          | -46.44        | -11.90                 | -58.34               | -13.00      | -45.34      |
| 229.82          | V                          | -46.93        | -14.07                 | -61.00               | -13.00      | -48.00      |
| 386.96          | V                          | -55.76        | -11.39                 | -67.15               | -13.00      | -54.15      |
| 476.20          | V                          | -61.15        | -8.38                  | -69.53               | -13.00      | -56.53      |
| 73.65           | H                          | -36.84        | -18.80                 | -55.64               | -13.00      | -42.64      |
| 150.28          | H                          | -41.18        | -12.93                 | -54.11               | -13.00      | -41.11      |
| 179.38          | H                          | -46.01        | -12.63                 | -58.63               | -13.00      | -45.63      |
| 232.73          | H                          | -45.54        | -14.87                 | -60.41               | -13.00      | -47.41      |
| 382.11          | H                          | -55.16        | -11.31                 | -66.47               | -13.00      | -53.47      |
| 508.21          | H                          | -61.79        | -7.76                  | -69.55               | -13.00      | -56.55      |

**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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % 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                          | -42.58        | -12.78                 | -55.37               | -13.00      | -42.37      |
| 73.65           | V                          | -37.81        | -16.51                 | -54.32               | -13.00      | -41.32      |
| 88.20           | V                          | -39.67        | -20.62                 | -60.28               | -13.00      | -47.28      |
| 147.37          | V                          | -46.72        | -11.91                 | -58.63               | -13.00      | -45.63      |
| 229.82          | V                          | -46.16        | -14.07                 | -60.23               | -13.00      | -47.23      |
| 372.41          | V                          | -55.11        | -11.89                 | -67.00               | -13.00      | -54.00      |
| 72.68           | H                          | -36.34        | -18.50                 | -54.84               | -13.00      | -41.84      |
| 149.31          | H                          | -41.26        | -13.01                 | -54.27               | -13.00      | -41.27      |
| 183.26          | H                          | -45.70        | -12.94                 | -58.64               | -13.00      | -45.64      |
| 228.85          | H                          | -45.49        | -15.10                 | -60.59               | -13.00      | -47.59      |
| 378.23          | H                          | -55.22        | -11.47                 | -66.69               | -13.00      | -53.69      |
| 552.83          | H                          | -60.95        | -7.46                  | -68.42               | -13.00      | -55.42      |

**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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 1651.00         | V                          | -48.07        | 1.63                   | -46.44               | -13.00      | -33.44      |
| 2470.00         | V                          | -41.39        | 4.75                   | -36.64               | -13.00      | -23.64      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 1651.00         | H                          | -45.60        | 1.63                   | -43.96               | -13.00      | -30.96      |
| 2470.00         | H                          | -47.57        | 4.74                   | -42.83               | -13.00      | -29.83      |
| 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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 1672.00         | V                          | -49.79        | 1.64                   | -48.16               | -13.00      | -35.16      |
| 2512.00         | V                          | -45.38        | 4.96                   | -40.42               | -13.00      | -27.42      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 1672.00         | H                          | -47.85        | 1.66                   | -46.19               | -13.00      | -33.19      |
| 2512.00         | H                          | -50.26        | 4.94                   | -45.33               | -13.00      | -32.33      |
| 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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 1700.00         | V                          | -49.02        | 1.65                   | -47.37               | -13.00      | -34.37      |
| 2547.00         | V                          | -45.47        | 5.02                   | -40.45               | -13.00      | -27.45      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 1700.00         | H                          | -46.06        | 1.68                   | -44.37               | -13.00      | -31.37      |
| 2547.00         | H                          | -50.12        | 4.98                   | -45.13               | -13.00      | -32.13      |
| 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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 1651.00         | V                          | -48.10        | 1.63                   | -46.47               | -13.00      | -33.47      |
| 2470.00         | V                          | -41.72        | 4.75                   | -36.97               | -13.00      | -23.97      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 1651.00         | H                          | -44.65        | 1.63                   | -43.01               | -13.00      | -30.01      |
| 2470.00         | H                          | -47.22        | 4.74                   | -42.48               | -13.00      | -29.48      |
| 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 190**Test Date:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 1672.00         | V                          | -50.69        | 1.64                   | -49.06               | -13.00      | -36.06      |
| 2512.00         | V                          | -46.56        | 4.96                   | -41.60               | -13.00      | -28.60      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 1672.00         | H                          | -46.07        | 1.66                   | -44.41               | -13.00      | -31.41      |
| 2512.00         | H                          | -51.17        | 4.94                   | -46.23               | -13.00      | -33.23      |
| 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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 55 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 1700.00         | V                          | -47.86        | 1.65                   | -46.21               | -13.00      | -33.21      |
| 2547.00         | V                          | -47.65        | 5.02                   | -42.63               | -13.00      | -29.63      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 1700.00         | H                          | -46.33        | 1.68                   | -44.64               | -13.00      | -31.64      |
| 2547.00         | H                          | -51.53        | 4.98                   | -46.55               | -13.00      | -33.55      |
| 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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 3702.00         | V                          | -60.01        | 7.57                   | -52.44               | -13.00      | -39.44      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 3702.00         | H                          | -57.03        | 6.71                   | -50.32               | -13.00      | -37.32      |
| 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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 55 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 3758.00         | V                          | -61.18        | 7.81                   | -53.37               | -13.00      | -40.37      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 3758.00         | H                          | -56.52        | 6.83                   | -49.69               | -13.00      | -36.69      |
| 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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 3821.00         | V                          | -60.60        | 8.09                   | -52.51               | -13.00      | -39.51      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 3821.00         | H                          | -57.49        | 6.95                   | -50.54               | -13.00      | -37.54      |
| 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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 3702.00         | V                          | -61.29        | 7.57                   | -53.72               | -13.00      | -40.72      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 3702.00         | H                          | -58.21        | 6.71                   | -51.50               | -13.00      | -38.50      |
| 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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 3758.00         | V                          | -60.92        | 7.81                   | -53.11               | -13.00      | -40.11      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 3758.00         | H                          | -58.11        | 6.83                   | -51.28               | -13.00      | -38.28      |
| 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:** August 30, 2010**Temperature:** 25°C**Tested by:** Rex Lai**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 3821.00         | V                          | -63.51        | 8.09                   | -55.42               | -13.00      | -42.42      |
| N/A             |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
|                 |                            |               |                        |                      |             |             |
| 3821.00         | H                          | -58.50        | 6.95                   | -51.55               | -13.00      | -38.55      |
| 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.*



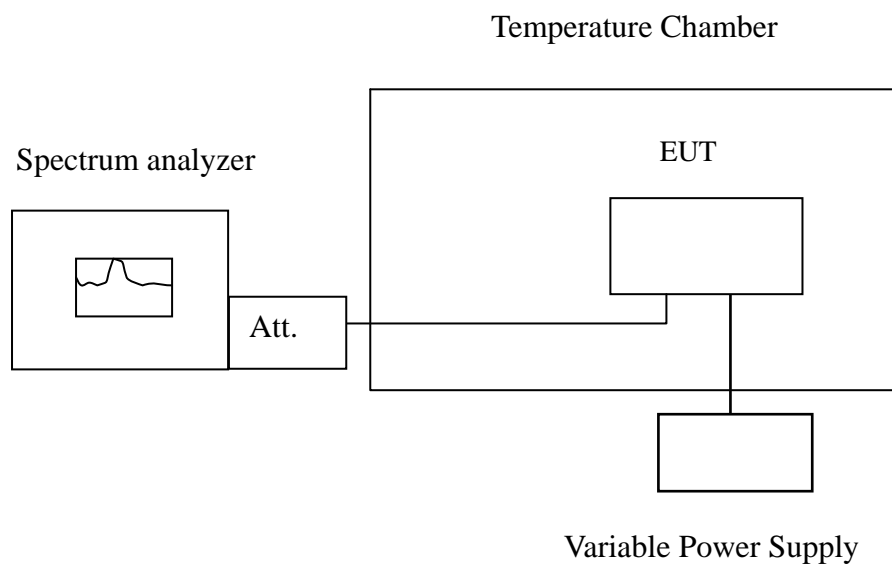
## 7.7 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

### LIMIT

According to FCC §2.1055, FCC §22.355, .FCC §24.235.

Frequency Tolerance: 2.5 ppm

### Test Configuration



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



## **TEST PROCEDURE**

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

## **TEST RESULTS**

*No non-compliance noted.*

| <b>Reference Frequency: GSM Mid Channel 836.6 MHz @ 20°C</b> |                                 |                   |               |               |
|--|---------------------------------|-------------------|---------------|---------------|
| Limit: $\pm 2.5$ ppm = 2090 Hz                               |                                 |                   |               |               |
| Power Supply<br>Vdc  | Environment<br>Temperature (°C) | Frequency<br>(Hz) | Delta<br>(Hz) | Limit<br>(Hz) |
| 3.7  | 50                              | 836600016         | 21            | 2090          |
|  | 40                              | 836600017         | 22            |               |
|  | 30                              | 836600020         | 25            |               |
|  | 20                              | 836599995         | 0             |               |
|  | 10                              | 836600019         | 24            |               |
|  | 0                               | 836600030         | 35            |               |
|  | -10                             | 836600022         | 27            |               |
|  | -20                             | 836600026         | 31            |               |
|  | -30                             | 836600036         | 41            |               |

| <b>Reference Frequency: GSM Mid Channel 1880 MHz @ 20°C</b> |                                 |                   |               |               |
|---|---------------------------------|-------------------|---------------|---------------|
| Limit: $\pm 2.5$ ppm = 4700 Hz                              |                                 |                   |               |               |
| Power Supply<br>Vdc   | Environment<br>Temperature (°C) | Frequency<br>(Hz) | Delta<br>(Hz) | Limit<br>(Hz) |
| 3.7   | 50                              | 1880000010        | 25            | 4700          |
|   | 40                              | 1880000022        | 37            |               |
|   | 30                              | 1880000014        | 29            |               |
|   | 20                              | 1879999985        | 0             |               |
|   | 10                              | 1880000006        | 21            |               |
|   | 0                               | 1879999998        | 13            |               |
|   | -10                             | 1880000009        | 24            |               |
|   | -20                             | 1880000012        | 27            |               |
|   | -30                             | 1880000014        | 29            |               |



| Reference Frequency: GPRS Mid Channel 836.6 MHz @ 20°C |                                 |                   |               |               |
|--|---------------------------------|-------------------|---------------|---------------|
| Limit: +/- 2.5 ppm = 2090 Hz                           |                                 |                   |               |               |
| Power Supply<br>Vdc                                    | Environment<br>Temperature (°C) | Frequency<br>(Hz) | Delta<br>(Hz) | Limit<br>(Hz) |
| 3.7  | 50                              | 836600011         | 31            | 2090          |
|  | 40                              | 836600031         | 51            |               |
|  | 30                              | 836599990         | 10            |               |
|  | 20                              | 836599980         | 0             |               |
|  | 10                              | 836599995         | 15            |               |
|  | 0                               | 836600006         | 26            |               |
|  | -10                             | 836600025         | 45            |               |
|  | -20                             | 836600006         | 26            |               |
|  | -30                             | 836600041         | 61            |               |

| Reference Frequency: GPRS Mid Channel 1880 MHz @ 20°C |                                 |                   |               |               |
|---|---------------------------------|-------------------|---------------|---------------|
| Limit: ± 2.5 ppm = 4700 Hz                            |                                 |                   |               |               |
| Power Supply<br>Vdc                                   | Environment<br>Temperature (°C) | Frequency<br>(Hz) | Delta<br>(Hz) | Limit<br>(Hz) |
| 3.7   | 50                              | 1879999998        | 8             | 4700          |
|   | 40                              | 1879999997        | 7             |               |
|   | 30                              | 1880000003        | 13            |               |
|   | 20                              | 1879999990        | 0             |               |
|   | 10                              | 1880000003        | 13            |               |
|   | 0                               | 1880000005        | 15            |               |
|   | -10                             | 1880000010        | 20            |               |
|   | -20                             | 1879999994        | 4             |               |
|   | -30                             | 1879999995        | 5             |               |

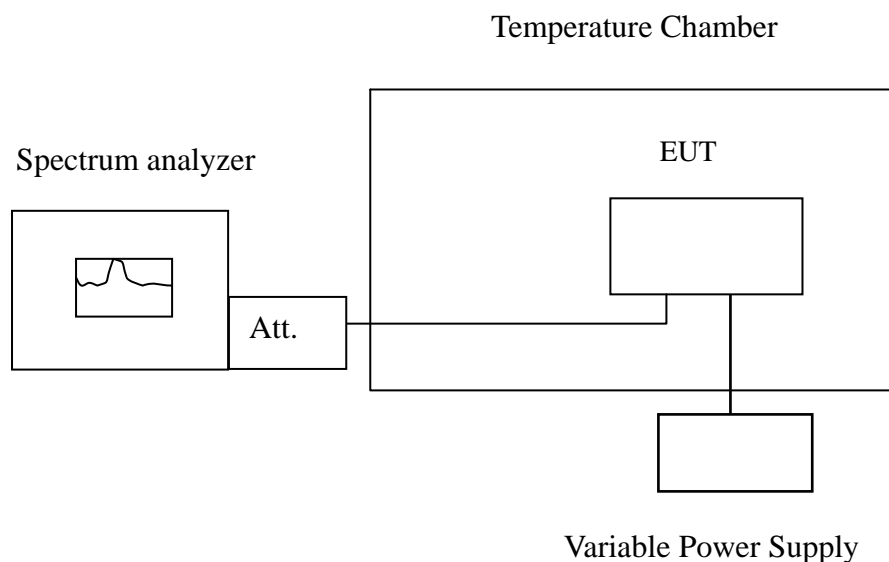


## **7.8 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT**

### **LIMIT**

According to FCC §2.1055, FCC §22.355, .FCC §24.235,

### **Test Configuration**



**Remark:** Measurement setup for testing on Antenna connector.



## **TEST PROCEDURE**

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ( $\pm 15\%$ ) and endpoint, record the maximum frequency change.

## **TEST RESULTS**

*No non-compliance noted.*

| Reference Frequency: GSM Mid Channel 836.6 MHz @ 20°C |                              |                |            |            |
|---|------------------------------|----------------|------------|------------|
| Limit: $\pm 2.5$ ppm = 2090Hz                         |                              |                |            |            |
| Power Supply Vdc                                      | Environment Temperature (°C) | Frequency (Hz) | Delta (Hz) | Limit (Hz) |
| 4.255   | 20                           | 836599975      | -20        | 2090       |
| 3.7   |                              | 836599995      | 0          |            |
| 3.145   |                              | 836600010      | 15         |            |
| 2.9 (End Point)                                       |                              | 836599937      | -58        |            |

| Reference Frequency: GSM Mid Channel 1880 MHz @ 20°C |                              |                |            |            |
|--|------------------------------|----------------|------------|------------|
| Limit: $\pm 2.5$ ppm = 4700 Hz                       |                              |                |            |            |
| Power Supply Vdc                                     | Environment Temperature (°C) | Frequency (Hz) | Delta (Hz) | Limit (Hz) |
| 4.255  | 20                           | 1879999984     | -1         | 4700       |
| 3.7  |                              | 1879999985     | 0          |            |
| 3.145  |                              | 1879999986     | 1          |            |
| 2.9 (End Point)                                      |                              | 1879999919     | -66        |            |



| Reference Frequency: GPRS Mid Channel 836.6 MHz @ 20°C |                                 |                   |               |               |
|--|---------------------------------|-------------------|---------------|---------------|
| Limit: $\pm 2.5$ ppm = 2090Hz                          |                                 |                   |               |               |
| Power Supply<br>Vdc                                    | Environment<br>Temperature (°C) | Frequency<br>(Hz) | Delta<br>(Hz) | Limit<br>(Hz) |
| 4.255  | 20                              | 836599964         | -16           | 2090          |
| 3.7  |                                 | 836599980         | 0             |               |
| 3.145  |                                 | 836599990         | 10            |               |
| 2.9 (End Point)  |                                 | 836599922         | -58           |               |

| Reference Frequency: GPRS Mid Channel 1880 MHz @ 20°C |                                 |                   |               |               |
|---|---------------------------------|-------------------|---------------|---------------|
| Limit: $\pm 2.5$ ppm = 4700 Hz                        |                                 |                   |               |               |
| Power Supply<br>Vdc                                   | Environment<br>Temperature (°C) | Frequency<br>(Hz) | Delta<br>(Hz) | Limit<br>(Hz) |
| 4.255   | 20                              | 1879999994        | 4             | 4700          |
| 3.7   |                                 | 1879999990        | 0             |               |
| 3.145   |                                 | 1879999988        | -2            |               |
| 2.9 (End Point)                                       |                                 | 1879999940        | -50           |               |





## 7.9 POWERLINE CONDUCTED EMISSIONS

### LIMIT

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

| Frequency Range (MHz) | Limits (dBμV) |          |
|-----------------------|---------------|----------|
|                       | Quasi-peak    | Average  |
| 0.15 to 0.50          | 66 to 56      | 56 to 46 |
| 0.50 to 5             | 56            | 46       |
| 5 to 30               | 60            | 50       |

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

### Test Configuration

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

### TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

**TEST RESULTS**

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

**Operation Mode:** Normal Link

**Test Date:** August 31, 2010

**Temperature:** 26°C

**Tested by:** Rex Lai

**Humidity:** 60% RH

| Freq. (MHz) | QP Reading (dBuV) | AV Reading (dBuV) | Corr. factor (dB) | QP Result (dBuV) | AV Result (dBuV) | QP Limit (dBuV) | AV Limit (dBuV) | QP Margin (dB) | AV Margin (dB) | Note |
|-------------|-------------------|-------------------|-------------------|------------------|------------------|-----------------|-----------------|----------------|----------------|------|
| 0.2100      | 37.87             | 21.27             | 0.13              | 38.00            | 21.40            | 63.21           | 53.21           | -25.21         | -31.81         | L1   |
| 0.3300      | 37.66             | 19.86             | 0.14              | 37.80            | 20.00            | 59.45           | 49.45           | -21.65         | -29.45         | L1   |
| 2.0400      | 24.54             | 7.84              | 0.06              | 24.60            | 7.90             | 56.00           | 46.00           | -31.40         | -38.10         | L1   |
| 2.6700      | 20.83             | 6.13              | 0.07              | 20.90            | 6.20             | 56.00           | 46.00           | -35.10         | -39.80         | L1   |
| 3.1800      | 19.72             | 4.52              | 0.08              | 19.80            | 4.60             | 56.00           | 46.00           | -36.20         | -41.40         | L1   |
| 6.1200      | 11.53             | 0.03              | 0.17              | 11.70            | 0.20             | 60.00           | 50.00           | -48.30         | -49.80         | L1   |
| 0.2400      | 34.48             | 22.38             | 0.12              | 34.60            | 22.50            | 62.10           | 52.10           | -27.50         | -29.60         | L2   |
| 0.3300      | 34.57             | 20.37             | 0.13              | 34.70            | 20.50            | 59.45           | 49.45           | -24.75         | -28.95         | L2   |
| 0.9900      | 27.06             | 12.96             | 0.14              | 27.20            | 13.10            | 56.00           | 46.00           | -28.80         | -32.90         | L2   |
| 1.7700      | 23.43             | 9.23              | 0.07              | 23.50            | 9.30             | 56.00           | 46.00           | -32.50         | -36.70         | L2   |
| 2.2200      | 19.55             | 6.25              | 0.05              | 19.60            | 6.30             | 56.00           | 46.00           | -36.40         | -39.70         | L2   |
| 2.9700      | 14.44             | 2.54              | 0.06              | 14.50            | 2.60             | 56.00           | 46.00           | -41.50         | -43.40         | L2   |

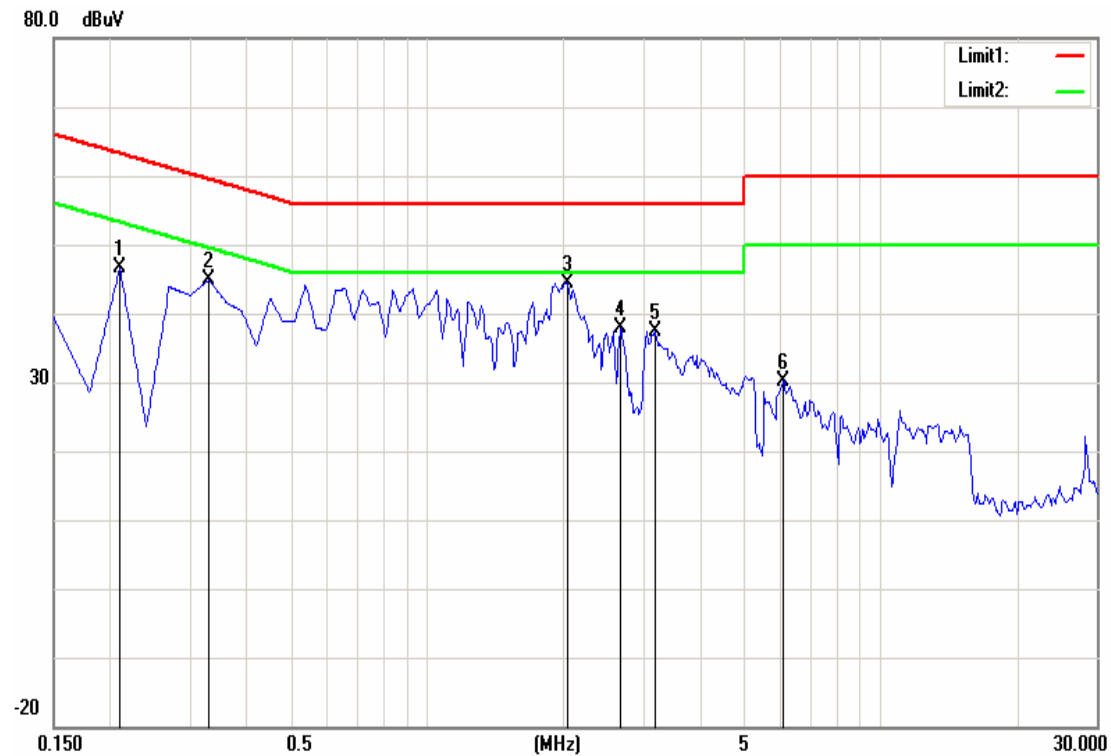
**Remark:**

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz and 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)



## Test Plots

### Conducted emissions (Line 1)



### Conducted emissions (Line 2)

