

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT****INTENTIONAL RADIATOR CERTIFICATION TO  
FCC PART 22 SUBPART H, PART 24 SUBPART E  
AND INDUSTRY CANADA RSS-132 and RSS-133  
CLASS II PC REPORT***For*

**Product Description:** Luke

**Trade Name:** N/A

**Model Name:** HSTNN-I77C

**Model Difference:** N/A

**FCC ID:** J9CGOBI2000-H

**IC:** 2723A-GOBI2000

**Report No.:** EH/2009/90052

**Issue Date:** Oct. 07, 2009

**FCC Rule Part:** 2, 22H & 24E

**IC Rule Part:** RSS 132 Issue 2 and RSS 133 Issue 5

**Prepared for:** Qualcomm Incorporated  
5775 Morehouse Dr, San Diego, CA 92121, U.S.A

**Prepared by:** SGS Taiwan Ltd.  
Electronics & Communication Laboratory  
No. 134, Wu Kung Rd., Wuku Industrial Zone,  
Taipei County, Taiwan.

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## CERTIFICATION OF COMPLIANCE

**Applicant:** Qualcomm Incorporated  
5775 Morehouse Dr, San Diego, CA 92121, U.S.A

**Product Description:** Luke

**Trade Name:** N/A

**FCC ID:** J9CGOBI2000-H

**IC:** 2723A-GOBI2000

**Model No.:** HSTNN-I77C

**Model Difference:** N/A

**File Number:** EH/2009/90052

**Date of test:** Sep. 25, 2009 ~ Oct. 07, 2009

**Date of EUT Received:** Sep. 25, 2009

**We hereby certify that:**

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C-2004, Issue 2 of RSS-Gen and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule PART 22 subpart H, PART 24 subpart E and IC standards RSS-132 Issue 2, Issue 5 of RSS-133.

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

**Test By:** Jazz Huang **Date:** Oct. 07, 2009

*Jazz Huang / Engineer*

**Prepared By:** Tiffany Kao **Date:** Oct. 07, 2009

*Tiffany Kao / Clerk*

**Approved By:** Vincent Su **Date:** Oct. 07, 2009

*Vincent Su / Manager*

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## Version

| Version No. | Date          | Description                  |
|-------------|---------------|------------------------------|
| 00          | Oct. 07, 2009 | Initial creation of document |
|             |               |                              |
|             |               |                              |

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## 1. GENERAL INFORMATION

### 1.1 Product Description

#### General:

|                   |  |
|-------------------|--|
| Type Name:        | Luke   |
| Brand Name:       | N/A  |
| Model Name:       | HSTNN-I77C   |
| Model Difference: | N/A  |
| Power Supply:     | 11.1 Vdc re-chargeable battery or 18.5Vdc by AC/DC power adapter, model: Series N193 |

#### GSM / WCDMA / CDMA:

|   |                           |                          |
|---|---------------------------|--------------------------|
| Cellular Phone Standards<br>Frequency Range | GPRS 850                  | 824.2 - 848.8 MHz        |
|   | EDGE 850                  | 824.2 - 848.8 MHz        |
|   | GPRS 1900                 | 1850.2 – 1909.8 MHz      |
|   | EDGE 1900                 | 1850.2 – 1909.8 MHz      |
|   | WCDMA/HSUPA/HSDPA Band II | 1852.4 – 1907.6 MHz      |
|   | WCDMA/HSUPA/HSDPA Band V  | 826.4 - 846.6 MHz        |
|   | CDMA2000 Cellular         | 824.7 MHz – 848.31MHz    |
|   | CDMA2000 PCS              | 1851.25 MHz – 1908.75MHz |
| IMEI  | 359881020083341           |                          |
| Hardware Version                            | P3 Rev D                  |                          |
| Software Version                            | 3574                      |                          |

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|  |  |
|--|--|
| <p>Type of Emission</p>  | <p>22H(GMSK): 824.2 - 848.8 MHz: 248KGXW<br/>                 24E(GMSK): 1850.2 – 1909.8 MHz: 250KGXW<br/>                 22H(8PSK): 824.2 - 848.8 MHz: 248KG7W<br/>                 24E(8PSK): 1850.2 – 1909.8 MHz: 250KG7W<br/>                 22H(WCDMA): 826.4 - 846.6 MHz: 4M18F9W<br/>                 24E(WCDMA): 1852.4 – 1907.5 MHz: 4M19F9W<br/>                 22H(CDMA) 824.7 - 848.31 MHz: 1M28F9W<br/>                 24E(CDMA): 1851.25 – 1908.75 MHz: 1M28F9W</p>  |
| <p>Transmit power<br/>(Conducted Power) Listed<br/>in Test Report/Original<br/>Grant</p> | <p>22H(GMSK): 824.2 - 848.8 MHz: 1.919W /32.831dBm<br/>                 24E(GMSK): 1850.2 – 1909.8 MHz: 0.874W /29.415dBm<br/>                 22H(8PSK): 824.2 - 848.8 MHz: 0.555W /27.443dBm<br/>                 24E(8PSK): 1850.2 – 1909.8 MHz: 0.396W /25.977dBm<br/>                 22H(WCDMA): 826.4 - 846.6 MHz: 0.262W /24.183dBm<br/>                 24E(WCDMA): 1852.4 – 1907.5 MHz: 0.256W /24.082dBm<br/>                 22H(CDMA) 824.7 - 848.31 MHz: 0.29W /24.6dBm<br/>                 24E(CDMA): 1851.25 – 1908.75 MHz: 0.291W /24.639dBm</p> |

This test report applies for GPRS/EDGE 850, GPRS/EDGE 1900, WCDMA/HSUPA/HSDPA Band II, Band V bands, CDMA2000 Cellular and PCS bands.

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

This submittal(s) (test report) is intended for **FCC ID: J9CGOBI2000-H** filing to comply with Section Part 22 subpart H, Part 24 subpart E of the **FCC CFR 47 Rules**. And **IC: 2723A-GOBI2000** filing to comply with RSS-132 and Issue 5 of RSS-133

## 1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA-603-C-2004 and FCC CFR 47 2.1046, 2.1053, RSS-132, Issue 5 of RSS-133 and Issue 2 of RSS-Gen.

## 1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1

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

## 1.5 Special Accessories

Not available for this EUT intended for grant.

## 1.6 Equipment Modifications

Not available for this EUT intended for grant.

## 2. SYSTEM TEST CONFIGURATION

### 2.1 EUT Configuration

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

### 2.2 EUT Exercise

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

### 2.3 Test Procedure

#### 2.3.1 Conducted Measurement at Antenna Port:

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

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

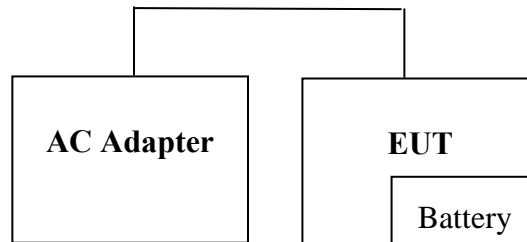
According to measurement procured TIA/EIA 603C, issue 2 of RSS-Gen and TIA/EIA IS-98 for Mobile stations. The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements.

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

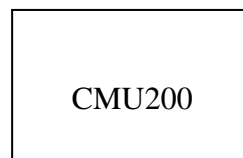


## 2.4 Configuration of Tested System

**Fig. 1-1 Configuration for Radiated Emission**



**Fig. 1-2 Configuration (Remote Side, on the corner)**



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

| Item | Equipment                               | Mfr/Brand | Model/<br>Type No. | Series No. | Data Cable | Power Cord  |
|------|---|-----------|--------------------|------------|------------|-------------|
| 1.   | Universal Radio<br>Communication Tester | R&S       | CMU200             | 102189     | Shielded   | Un-shielded |

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### 3. SUMMARY OF TEST RESULTS

| FCC Rules   | IC Rules   | Description Of Test                       | Result    |
|---|--|---|-----------|
| §2.1046(a)<br>§22.913(a)(2)<br>§24.232(c)<br>§27.50(d)(2) | §4.8 (RSS-Gen)<br>§4.4 (RSS-132)<br>§6.4 (RSS-133) | ERP/ EIRP measurement                     | Compliant |
| §2.1053<br>§22.917(a)<br>§24.238(a)<br>§27.53(g)          | §4.9 (RSS-Gen)<br>§4.5 (RSS-132)<br>§6.5 (RSS-133) | Field Strength of Spurious Radiation (TX) | Compliant |

### 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Set EUT power control “all up bits” for all test mode through base station.

The Channel Low, Mid and High for each type of bands with rated data rate were chosen for above testing.

The field strength of ERP/EIRP power and spurious radiation emission were measured as EUT stand up position for both GPRS 850 and 1900 bands were reported which has worst data.

## 5. ERP/EIRP MEASUREMENT

### 5.1 Standard Applicable

According to FCC §2.1046

FCC 22.913(a)(2) Mobile station are limited to 7W ERP.

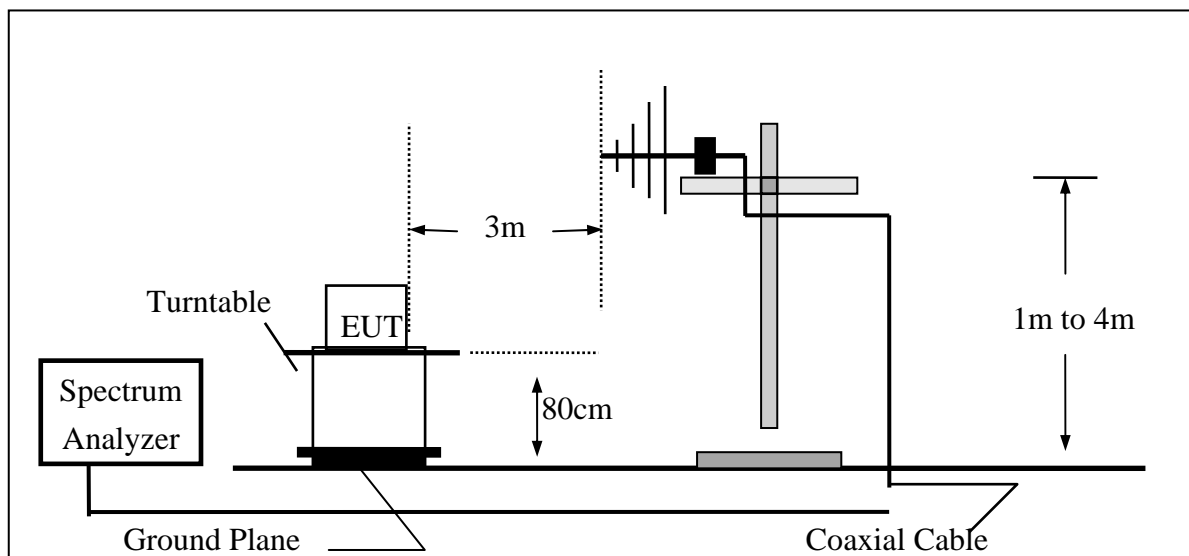
FCC 24.232(c) Mobile station are limited to 2W EIRP.

According to issue 5 of RSS-133 §6.4. The peak e.i.r.p. for transmitters operating in the band 1850-1910 MHz shall not exceed the limits given in SRSP-510.

According to issue 2 of RSS 132, section 4.4. The transmitter output power shall not exceed the limits given in SRSP-503.

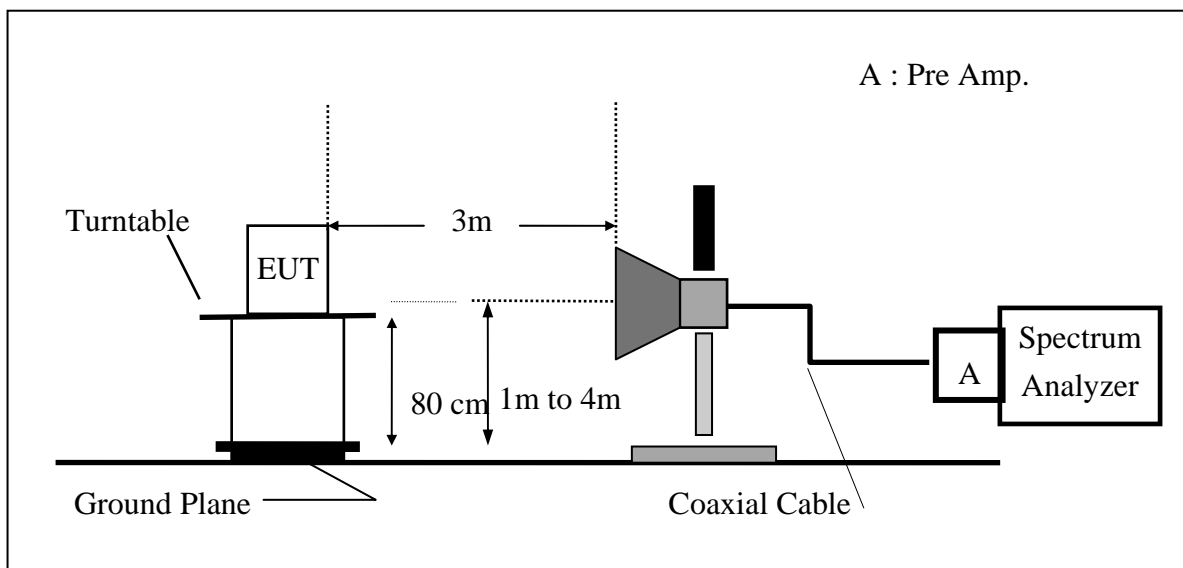
### 5.2 Test SET-UP (Block Diagram of Configuration)

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

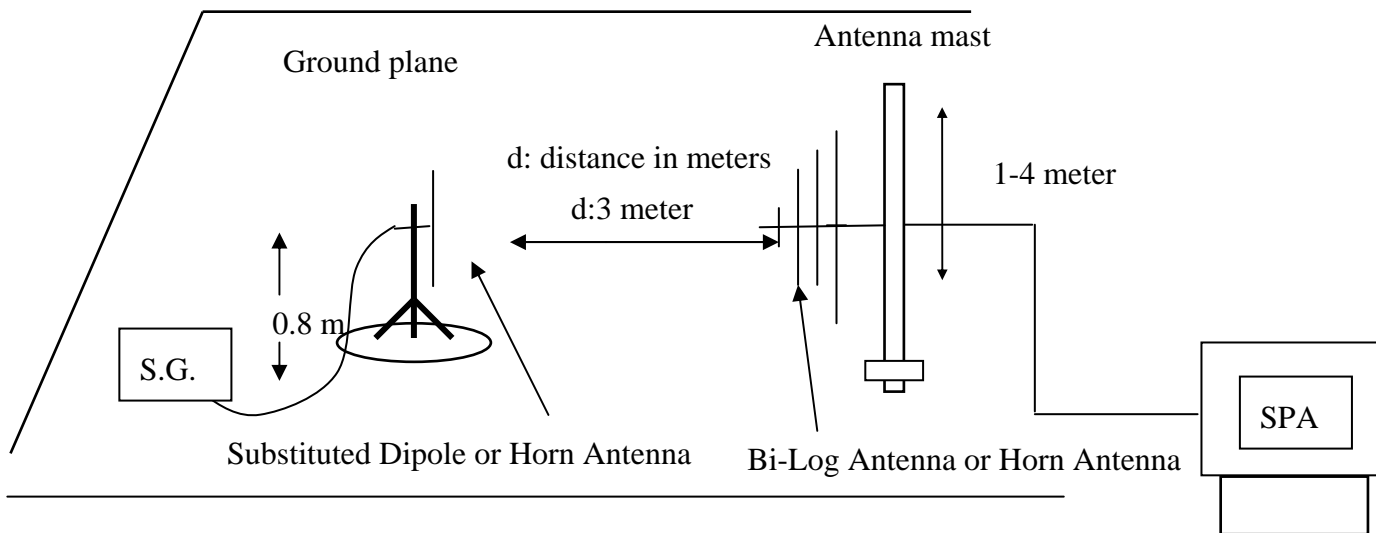


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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



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### 5.3 Measurement Procedure

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

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

ERP in frequency band 824.2 –848.80.8MHz were measured using a substitution method. The EUT was replaced by a dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

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

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

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

## 5.4 Measurement Equipment Used:

| ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber |               |                     |               |            |            |
|--|---------------|---------------------|---------------|------------|------------|
| EQUIPMENT TYPE                                   | MFR MODEL     | SERIAL NUMBER       | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Spectrum Analyzer                                | R&S           | FSP 40              | 100034        | 02/12/2009 | 02/11/2010 |
| Bilog Antenna                                    | SCHWAZBECK    | VULB9160            | 9160-3136     | 11/15/2008 | 11/14/2009 |
| Dipole Antenna                                   | SCHWAZBECK    | VHAP                | 908/909       | 07/10/2008 | 07/09/2010 |
| Dipole Antenna                                   | SCHWAZBECK    | UHAP                | 891/892       | 07/10/2008 | 07/09/2010 |
| Hor.n antenna                                    | SCHWAZBECK    | BBHA 9120D          | 309           | 01/22/2008 | 01/21/2010 |
| Horn antenna                                     | SCHWAZBECK    | BBHA 9120D          | 9120D-673     | 05/09/2008 | 05/08/2010 |
| Signal Generator                                 | R&S           | SMR40               | 100210        | 01/22/2008 | 01/21/2010 |
| Signal Generator                                 | Agilent       | E4438C              | MY45093613    | 06/11/2009 | 06/10/2010 |
| Pre-Amplifier                                    | Agilent       | 8447D               | 1937A02834    | 11/30/2008 | 11/29/2009 |
| Pre-Amplifier                                    | Agilent       | 8449B               | 3008A01973    | 01/05/2009 | 01/04/2010 |
| Attenuator                                       | Mini-Circuit  | BW-S20W5            | 001           | 07/05/2009 | 07/04/2010 |
| Attenuator                                       | Mini-Circuit  | BW-S10W5            | 001           | 07/05/2009 | 07/04/2010 |
| Attenuator                                       | Mini-Circuit  | BW-S6W5             | 001           | 07/05/2009 | 07/04/2010 |
| Radio Communication Analyzer                     | R&S           | CMU200              | 102189        | 05/13/2008 | 05/12/2010 |
| Turn Table                                       | HD            | DT420               | N/A           | N.C.R      | N.C.R      |
| Antenna Tower                                    | HD            | MA240-N             | 240/657       | N.C.R      | N.C.R      |
| Controller                                       | HD            | HD100               | N/A           | N.C.R      | N.C.R      |
| Low Loss Cable                                   | HUBER+SUHNER  | SUCOFLEX 104PEA-10M | 10m           | 01/05/2009 | 01/04/2010 |
| Low Loss Cable                                   | HUBER+SUHNER  | SUCOFLEX 104PEA-3M  | 3m            | 01/05/2009 | 01/04/2010 |
| Filter 800-1000                                  | Micro-Tronics | BRM13462            | 1             | 01/05/2009 | 01/04/2010 |
| Filter 1800-2000                                 | Micro-Tronics | BRM13463            | 1             | 01/05/2009 | 01/04/2010 |
| 3m Site  | SGS           | 966 chamber         | N/A           | 11/08/2008 | 11/09/2009 |

## 5.5 Measurement Result

Refer to following pages for detail.

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### Measurement Result:

| EUT Mode | Frequency (MHz) | CH  | EUT Pol. | Antenna Pol. | SPA Reading (dBuV) | S.G. Output (dBm) | Antenna Gain (dBi) | Cable Loss (dB) | ERP (dBm) | Limit (dBm) |
|----------|-----------------|-----|----------|--------------|--------------------|-------------------|--------------------|-----------------|-----------|-------------|
| GPRS 850 | 824.20          | 128 | H        | V            | 128.08             | 41.69             | -7.87              | 3.62            | 30.19     | 38.45       |
|          |                 |     |          | H            | 128.65             | 42.38             | -7.87              | 3.62            | 30.88     | 38.45       |
|          | 836.60          | 190 | H        | V            | 127.61             | 41.36             | -7.88              | 3.65            | 29.83     | 38.45       |
|          |                 |     |          | H            | 128.42             | 42.19             | -7.88              | 3.65            | 30.66     | 38.45       |
|          | 848.80          | 251 | H        | V            | 127.72             | 41.60             | -7.88              | 3.68            | 30.04     | 38.45       |
|          |                 |     |          | H            | 128.70             | 42.51             | -7.88              | 3.68            | 30.95     | 38.45       |

#### Remark :

- (1) The RBW,VBW of SPA for frequency  
RBW=300 KHz, VBW=1MHz

| EUT Mode  | Frequency (MHz) | CH  | EUT Pol. | Antenna Pol. | SPA Reading (dBuV) | S.G. Output (dBm) | Antenna Gain (dBi) | Cable Loss (dB) | EIRP (dBm) | Limit (dBm) |
|-----------|-----------------|-----|----------|--------------|--------------------|-------------------|--------------------|-----------------|------------|-------------|
| GPRS 1900 | 1850.20         | 512 | H        | V            | 126.88             | 22.49             | 9.90               | 5.56            | 26.83      | 33.00       |
|           |                 |     |          | H            | 125.23             | 21.05             | 9.90               | 5.56            | 25.39      | 33.00       |
|           | 1880.00         | 661 | H        | V            | 124.60             | 20.24             | 9.99               | 5.61            | 24.62      | 33.00       |
|           |                 |     |          | H            | 122.80             | 18.66             | 9.99               | 5.61            | 23.03      | 33.00       |
|           | 1909.80         | 810 | H        | V            | 124.96             | 20.63             | 10.08              | 5.66            | 25.05      | 33.00       |
|           |                 |     |          | H            | 124.64             | 20.53             | 10.08              | 5.66            | 24.95      | 33.00       |

#### Remark :

- (1) The RBW,VBW of SPA for frequency  
RBW=1MHz, VBW=1MHz

## 6. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT(TX)

### 6.1 Standard Applicable

According to FCC §2.1053,

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

According to RSS-132 §4.5 and RSS-133 §6.5

Out-of-Block Emissions

a. Mobile stations must comply with subsection i. below.

In the first 1.0MHz band immediately outside and adjacent to the licensee's frequency block. the power of emissions per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in watts) by at least  $43 + 10 \log$  (P), dB.

b. After the first 1.0 MHz (for equipment that complies with a.i. of this subsection) or 1.5 MHz (for equipment that complies with a.ii.of this subsection), the power of emissions shall be attenuated below the transmitter output power by at least  $43 + 10 \log$  (P), dB, per any MHz of bandwidth.

(Note: If the test result using 1% of the emission bandwidth is used, then power integration over 1.0 MHz is required; alternatively, the spectrum analyser resolution and video bandwidths can be increased to 1.0 MHz for this measurement).

Out-of-Sub-band Emissions

Outside the sub-bands 1850-1910 MHz and 1930-1990 MHz, the attenuation shall be equal to or greater than the out-of-block emission limits in Section 6.5.1.

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

Refer to section 5.2 for details



### 6.3 Measurement Procedure

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

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

ERP in frequency band 824.2 –848.80MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

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

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

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

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

### 6.4 Measurement Equipment Used:

Refer to section 5.4 for details

### 6.5 Measurement Result

Refer to attach tabular data sheets.

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### Radiated Spurious Emission Measurement Result: GPRS 850 Mode

|                       |                  |            |               |
|-----------------------|------------------|------------|---------------|
| Operation Mode        | : TX CH Low Mode | Test Date: | Oct. 07, 2009 |
| Fundamental Frequency | : 824.20 MHz     | Test By:   | Jazz          |
| Temperature           | : 25°C           | Pol:       | Hor           |
| Humidity              | : 65%            |            |               |

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 38.73       | 44.55               | H            | -58.64           | -3.25                 | 0.90            | -62.79         | -13.00      | -49.79            |
| 198.78      | 45.15               | H            | -56.41           | -7.84                 | 1.71            | -65.95         | -13.00      | -52.95            |
| 313.24      | 43.61               | H            | -53.93           | -7.85                 | 2.22            | -63.99         | -13.00      | -50.99            |
| 415.09      | 43.62               | H            | -52.04           | -7.67                 | 2.56            | -62.27         | -13.00      | -49.27            |
| 458.74      | 43.89               | H            | -49.92           | -7.70                 | 2.68            | -60.31         | -13.00      | -47.31            |
| 623.64      | 44.75               | H            | -45.49           | -7.80                 | 3.09            | -56.38         | -13.00      | -43.38            |
| 824.00      | 80.10               | H            | -6.17            | -7.87                 | 3.62            | -17.67         | -13.00      | -4.67             |
| 1644.00     | 46.29               | H            | -58.12           | 9.27                  | 5.22            | -54.06         | -13.00      | -41.06            |
| 2463.00     | 54.26               | H            | -46.71           | 10.08                 | 6.51            | -43.15         | -13.00      | -30.15            |
| 2963.00     | ---                 | H            |                  | 11.41                 | 7.20            |                | -13.00      |                   |
| 4121.00     | ---                 | H            |                  | 12.61                 | 8.86            |                | -13.00      |                   |
| 4945.20     | ---                 | H            |                  | 12.65                 | 9.74            |                | -13.00      |                   |
| 5769.40     | ---                 | H            |                  | 13.55                 | 10.54           |                | -13.00      |                   |
| 6593.60     | ---                 | H            |                  | 12.05                 | 11.30           |                | -13.00      |                   |
| 7417.80     | ---                 | H            |                  | 11.49                 | 12.10           |                | -13.00      |                   |
| 8242.00     | ---                 | H            |                  | 11.48                 | 12.71           |                | -13.00      |                   |

|                         |                         |
|-------------------------|-------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB   |
|                         | 80MHz - 1000MHz: 3.76dB |
|                         | 1GHz - 40GHz: 4.45dB    |

Remark :

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

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

Operation Mode : TX CH Mid Mode Test Date: Oct. 07, 2009  
 Fundamental Frequency : 836.60 MHz Test By: Jazz  
 Temperature : 25°C Pol: Ver  
 Humidity : 65%

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Out-put (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|-------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 90.14       | 49.73               | V            | -53.45            | -7.75                 | 1.27            | -62.47         | -13.00      | -49.47            |
| 198.78      | 49.91               | V            | -51.76            | -7.84                 | 1.71            | -61.31         | -13.00      | -48.31            |
| 264.74      | 49.36               | V            | -50.05            | -7.90                 | 2.04            | -59.99         | -13.00      | -46.99            |
| 295.78      | 50.70               | V            | -47.69            | -7.92                 | 2.15            | -57.76         | -13.00      | -44.76            |
| 460.68      | 43.87               | V            | -50.10            | -7.70                 | 2.69            | -60.50         | -13.00      | -47.50            |
| 623.64      | 49.31               | V            | -39.95            | -7.80                 | 3.09            | -50.84         | -13.00      | -37.84            |
| 1679.00     | 42.04               | V            | -62.51            | 9.38                  | 5.28            | -58.41         | -13.00      | -45.41            |
| 2498.00     | 55.34               | V            | -45.49            | 10.06                 | 6.57            | -42.00         | -13.00      | -29.00            |
| 5019.60     | ---                 | V            |                   | 12.67                 | 9.81            |                | -13.00      |                   |
| 5856.20     | ---                 | V            |                   | 13.68                 | 10.62           |                | -13.00      |                   |
| 6692.80     | ---                 | V            |                   | 11.95                 | 11.39           |                | -13.00      |                   |
| 7529.40     | ---                 | V            |                   | 11.45                 | 12.20           |                | -13.00      |                   |
| 8366.00     | ---                 | V            |                   | 11.59                 | 12.81           |                | -13.00      |                   |

|                         |                         |
|-------------------------|-------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB   |
|                         | 80MHz - 1000MHz: 3.76dB |
|                         | 1GHz - 40GHz: 4.45dB    |

Remark :

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

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### Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Mode : TX CH Mid Mode Test Date: Oct. 07, 2009  
 Fundamental Frequency : 836.60 MHz Test By: Jazz  
 Temperature : 25°C Pol: Hor  
 Humidity : 65%

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 198.78      | 45.39               | H            | -56.17           | -7.84                 | 1.71            | -65.71         | -13.00      | -52.71            |
| 264.74      | 44.17               | H            | -54.59           | -7.90                 | 2.04            | -64.53         | -13.00      | -51.53            |
| 313.24      | 44.55               | H            | -52.99           | -7.85                 | 2.22            | -63.05         | -13.00      | -50.05            |
| 415.09      | 43.42               | H            | -52.24           | -7.67                 | 2.56            | -62.47         | -13.00      | -49.47            |
| 455.83      | 43.89               | H            | -49.95           | -7.70                 | 2.68            | -60.33         | -13.00      | -47.33            |
| 623.64      | 44.47               | H            | -45.77           | -7.80                 | 3.09            | -56.66         | -13.00      | -43.66            |
| 1679.00     | 43.24               | H            | -61.13           | 9.38                  | 5.28            | -57.03         | -13.00      | -44.03            |
| 2498.00     | 62.20               | H            | -38.54           | 10.06                 | 6.57            | -35.05         | -13.00      | -22.05            |
| 4178.00     | 40.75               | H            | -55.30           | 12.62                 | 8.93            | -51.60         | -13.00      | -38.60            |
| 5019.60     | ---                 | H            |                  | 12.67                 | 9.81            |                | -13.00      |                   |
| 5856.20     | ---                 | H            |                  | 13.68                 | 10.62           |                | -13.00      |                   |
| 6692.80     | ---                 | H            |                  | 11.95                 | 11.39           |                | -13.00      |                   |
| 7529.40     | ---                 | H            |                  | 11.45                 | 12.20           |                | -13.00      |                   |
| 8366.00     | ---                 | H            |                  | 11.59                 | 12.81           |                | -13.00      |                   |

|                         |                         |
|-------------------------|-------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB   |
|                         | 80MHz - 1000MHz: 3.76dB |
|                         | 1GHz - 40GHz: 4.45dB    |

Remark :

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

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

Operation Mode : TX CH High Mode Test Date: Oct. 07, 2009  
 Fundamental Frequency : 848.80 MHz Test By: Jazz  
 Temperature : 25°C Pol: Ver  
 Humidity : 65%

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 36.79       | 46.12               | V            | -56.61           | -4.16                 | 0.91            | -61.68         | -13.00      | -48.68            |
| 198.78      | 49.92               | V            | -51.75           | -7.84                 | 1.71            | -61.30         | -13.00      | -48.30            |
| 264.74      | 48.54               | V            | -50.87           | -7.90                 | 2.04            | -60.81         | -13.00      | -47.81            |
| 295.78      | 50.88               | V            | -47.51           | -7.92                 | 2.15            | -57.58         | -13.00      | -44.58            |
| 455.83      | 43.64               | V            | -50.31           | -7.70                 | 2.68            | -60.69         | -13.00      | -47.69            |
| 623.64      | 48.88               | V            | -40.38           | -7.80                 | 3.09            | -51.27         | -13.00      | -38.27            |
| 849.01      | 79.41               | V            | -6.71            | -7.88                 | 3.68            | -18.27         | -13.00      | -5.27             |
| 1693.00     | 39.61               | V            | -64.93           | 9.42                  | 5.30            | -60.81         | -13.00      | -47.81            |
| 2533.00     | 43.31               | V            | -57.39           | 10.16                 | 6.61            | -53.84         | -13.00      | -40.84            |
| 2540.50     | ---                 | V            |                  | 10.18                 | 6.63            |                | -13.00      |                   |
| 3395.20     | ---                 | V            |                  | 12.38                 | 7.87            |                | -13.00      |                   |
| 4244.00     | ---                 | V            |                  | 12.63                 | 9.00            |                | -13.00      |                   |
| 5092.80     | ---                 | V            |                  | 12.74                 | 9.88            |                | -13.00      |                   |
| 5941.60     | ---                 | V            |                  | 13.81                 | 10.70           |                | -13.00      |                   |
| 6790.40     | ---                 | V            |                  | 11.86                 | 11.48           |                | -13.00      |                   |
| 7639.20     | ---                 | V            |                  | 11.40                 | 12.27           |                | -13.00      |                   |
| 8488.00     | ---                 | V            |                  | 11.70                 | 12.91           |                | -13.00      |                   |

|                         |                         |
|-------------------------|-------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB   |
|                         | 80MHz - 1000MHz: 3.76dB |
|                         | 1GHz - 40GHz: 4.45dB    |

**Remark :**

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

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

Operation Mode : TX CH Low Mode Test Date: Oct. 07, 2009  
 Fundamental Frequency : 1850.20MHz Test By: Jazz  
 Temperature : 25°C Pol: Ver  
 Humidity : 65%

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Out-put (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|-------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 36.79       | 48.01               | V            | -54.72            | -4.16                 | 0.91            | -59.79         | -13.00      | -46.79            |
| 90.14       | 47.41               | V            | -55.77            | -7.75                 | 1.27            | -64.79         | -13.00      | -51.79            |
| 198.78      | 47.76               | V            | -53.91            | -7.84                 | 1.71            | -63.46         | -13.00      | -50.46            |
| 310.33      | 42.14               | V            | -55.98            | -7.86                 | 2.21            | -66.05         | -13.00      | -53.05            |
| 460.68      | 44.16               | V            | -49.81            | -7.70                 | 2.69            | -60.21         | -13.00      | -47.21            |
| 623.64      | 49.93               | V            | -39.33            | -7.80                 | 3.09            | -50.22         | -13.00      | -37.22            |
| 1849.99     | 80.53               | V            | -23.86            | 9.90                  | 5.56            | -19.52         | -13.00      | -6.52             |
| 3688.00     | 49.36               | V            | -48.62            | 12.61                 | 8.29            | -44.31         | -13.00      | -31.31            |
| 5543.00     | 40.81               | V            | -50.05            | 13.21                 | 10.32           | -47.16         | -13.00      | -34.16            |
| 9251.00     | ---                 | V            |                   | 11.92                 | 13.50           |                | -13.00      |                   |
| 11101.20    | ---                 | V            |                   | 11.66                 | 15.11           |                | -13.00      |                   |
| 12951.40    | ---                 | V            |                   | 13.63                 | 16.60           |                | -13.00      |                   |
| 14801.60    | ---                 | V            |                   | 12.76                 | 17.95           |                | -13.00      |                   |
| 16651.80    | ---                 | V            |                   | 15.92                 | 19.14           |                | -13.00      |                   |
| 18502.00    | ---                 | V            |                   | 18.75                 | 10.40           |                | -13.00      |                   |

|                         |                         |
|-------------------------|-------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB   |
|                         | 80MHz - 1000MHz: 3.76dB |
|                         | 1GHz - 40GHz: 4.45dB    |

Remark :

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

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

Operation Mode : TX CH Low Mode Test Date: Oct. 07, 2009  
 Fundamental Frequency : 1850.20MHz Test By: Jazz  
 Temperature : 25°C Pol: Hor  
 Humidity : 65%

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Out-put (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|-------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 38.73       | 44.78               | H            | -58.41            | -3.25                 | 0.90            | -62.56         | -13.00      | -49.56            |
| 96.93       | 45.43               | H            | -57.80            | -7.76                 | 1.33            | -66.89         | -13.00      | -53.89            |
| 206.54      | 45.01               | H            | -56.32            | -7.85                 | 1.75            | -65.92         | -13.00      | -52.92            |
| 458.74      | 44.08               | H            | -49.73            | -7.70                 | 2.68            | -60.12         | -13.00      | -47.12            |
| 623.64      | 45.34               | H            | -44.90            | -7.80                 | 3.09            | -55.79         | -13.00      | -42.79            |
| 807.94      | 38.77               | H            | -47.55            | -7.87                 | 3.59            | -59.01         | -13.00      | -46.01            |
| 1849.99     | 76.62               | H            | -27.56            | 9.90                  | 5.56            | -23.22         | -13.00      | -10.22            |
| 3688.00     | 52.65               | H            | -45.45            | 12.61                 | 8.29            | -41.13         | -13.00      | -28.13            |
| 5443.00     | 40.35               | H            | -51.00            | 13.09                 | 10.22           | -48.13         | -13.00      | -35.13            |
| 12951.40    | ---                 | H            |                   | 13.63                 | 16.60           |                | -13.00      |                   |
| 14801.60    | ---                 | H            |                   | 12.76                 | 17.95           |                | -13.00      |                   |
| 16651.80    | ---                 | H            |                   | 15.92                 | 19.14           |                | -13.00      |                   |
| 18502.00    | ---                 | H            |                   | 18.75                 | 10.40           |                | -13.00      |                   |

|                         |                         |
|-------------------------|-------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB   |
|                         | 80MHz - 1000MHz: 3.76dB |
|                         | 1GHz - 40GHz: 4.45dB    |

Remark :

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

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### Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

|                       |                  |            |               |
|-----------------------|------------------|------------|---------------|
| Operation Mode        | : TX CH Mid Mode | Test Date: | Oct. 07, 2009 |
| Fundamental Frequency | : 1880MHz        | Test By:   | Jazz          |
| Temperature           | : 25°C           | Pol:       | Ver           |
| Humidity              | : 65%            |            |               |

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 36.79       | 49.07               | V            | -53.66           | -4.16                 | 0.91            | -58.73         | -13.00      | -45.73            |
| 90.14       | 47.42               | V            | -55.76           | -7.75                 | 1.27            | -64.78         | -13.00      | -51.78            |
| 198.78      | 47.42               | V            | -54.25           | -7.84                 | 1.71            | -63.80         | -13.00      | -50.80            |
| 455.83      | 44.16               | V            | -49.79           | -7.70                 | 2.68            | -60.17         | -13.00      | -47.17            |
| 623.64      | 50.08               | V            | -39.18           | -7.80                 | 3.09            | -50.07         | -13.00      | -37.07            |
| 870.99      | 37.93               | V            | -47.61           | -7.91                 | 3.73            | -59.24         | -13.00      | -46.24            |
| 3758.00     | 49.68               | V            | -47.99           | 12.60                 | 8.39            | -43.77         | -13.00      | -30.77            |
| 5634.00     | 42.42               | V            | -48.18           | 13.35                 | 10.41           | -45.23         | -13.00      | -32.23            |
| 11280.00    | ---                 | V            |                  | 11.92                 | 15.27           |                | -13.00      |                   |
| 13160.00    | ---                 | V            |                  | 13.33                 | 16.71           |                | -13.00      |                   |
| 15040.00    | ---                 | V            |                  | 13.76                 | 18.15           |                | -13.00      |                   |
| 16920.00    | ---                 | V            |                  | 15.27                 | 19.32           |                | -13.00      |                   |
| 18800.00    | ---                 | V            |                  | 18.68                 | 16.58           |                | -13.00      |                   |

|                         |                        |
|-------------------------|------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB  |
|                         | 80MHz -1000MHz: 3.76dB |
|                         | 1GHz - 40GHz: 4.45dB   |

Remark :

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

### Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

|                       |                  |            |               |
|-----------------------|------------------|------------|---------------|
| Operation Mode        | : TX CH Mid Mode | Test Date: | Oct. 07, 2009 |
| Fundamental Frequency | : 1880MHz        | Test By:   | Jazz          |
| Temperature           | : 25°C           | Pol:       | Hor           |
| Humidity              | : 65%            |            |               |

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 41.64       | 43.48               | H            | -60.03           | -2.31                 | 0.93            | -63.27         | -13.00      | -50.27            |
| 96.93       | 44.59               | H            | -58.64           | -7.76                 | 1.33            | -67.73         | -13.00      | -54.73            |
| 198.78      | 13.69               | H            | -87.87           | -7.84                 | 1.71            | -97.41         | -13.00      | -84.41            |
| 468.44      | 44.19               | H            | -49.54           | -7.71                 | 2.71            | -59.96         | -13.00      | -46.96            |
| 623.64      | 45.79               | H            | -44.45           | -7.80                 | 3.09            | -55.34         | -13.00      | -42.34            |
| 870.99      | 36.38               | H            | -49.25           | -7.91                 | 3.73            | -60.88         | -13.00      | -47.88            |
| 3758.00     | 55.62               | H            | -42.16           | 12.60                 | 8.39            | -37.95         | -13.00      | -24.95            |
| 5634.00     | 43.40               | H            | -47.37           | 13.35                 | 10.41           | -44.43         | -13.00      | -31.43            |
| 15040.00    | ---                 | H            |                  | 13.76                 | 18.15           |                | -13.00      |                   |
| 16920.00    | ---                 | H            |                  | 15.27                 | 19.32           |                | -13.00      |                   |
| 18800.00    | ---                 | H            |                  | 18.68                 | 16.58           |                | -13.00      |                   |

|                         |                         |
|-------------------------|-------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB   |
|                         | 80MHz - 1000MHz: 3.76dB |
|                         | 1GHz - 40GHz: 4.45dB    |

Remark :

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

### Radiated Spurious Emission Measurement Result: GPRS 1900 Mode

|                       |                   |            |               |
|-----------------------|-------------------|------------|---------------|
| Operation Mode        | : TX CH High Mode | Test Date: | Oct. 07, 2009 |
| Fundamental Frequency | : 1909.8 MHz      | Test By:   | Jazz          |
| Temperature           | : 25°C            | Pol:       | Ver           |
| Humidity              | : 65%             |            |               |

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Output (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 36.79       | 48.31               | V            | -54.42           | -4.16                 | 0.91            | -59.49         | -13.00      | -46.49            |
| 198.78      | 46.75               | V            | -54.92           | -7.84                 | 1.71            | -64.47         | -13.00      | -51.47            |
| 415.09      | 44.24               | V            | -50.79           | -7.67                 | 2.56            | -61.01         | -13.00      | -48.01            |
| 460.68      | 44.30               | V            | -49.67           | -7.70                 | 2.69            | -60.07         | -13.00      | -47.07            |
| 623.64      | 49.54               | V            | -39.72           | -7.80                 | 3.09            | -50.61         | -13.00      | -37.61            |
| 872.93      | 37.33               | V            | -48.16           | -7.91                 | 3.73            | -59.80         | -13.00      | -46.80            |
| 1910.02     | 79.86               | V            | -24.47           | 10.08                 | 5.66            | -20.05         | -13.00      | -7.05             |
| 3814.00     | 54.74               | V            | -42.68           | 12.60                 | 8.46            | -38.54         | -13.00      | -25.54            |
| 5718.00     | 40.94               | V            | -49.41           | 13.48                 | 10.49           | -46.42         | -13.00      | -33.42            |
| 9549.00     | ---                 | V            |                  | 11.95                 | 13.74           |                | -13.00      |                   |
| 11458.80    | ---                 | V            |                  | 12.17                 | 15.43           |                | -13.00      |                   |
| 13368.60    | ---                 | V            |                  | 12.97                 | 16.82           |                | -13.00      |                   |
| 15278.40    | ---                 | V            |                  | 15.00                 | 18.29           |                | -13.00      |                   |
| 17188.20    | ---                 | V            |                  | 14.47                 | 19.52           |                | -13.00      |                   |
| 19098.00    | ---                 | V            |                  | 18.66                 | 20.78           |                | -13.00      |                   |

|                         |                         |
|-------------------------|-------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB   |
|                         | 80MHz - 1000MHz: 3.76dB |
|                         | 1GHz - 40GHz: 4.45dB    |

Remark :

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

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