



## RF TEST REPORT

|                   |                    |
|-------------------|--------------------|
| <b>Applicant</b>  | CalAmp             |
| <b>FCC ID</b>     | APV-2640G          |
| <b>Product</b>    | LMU2640 GPRS       |
| <b>Model</b>      | LMU2640-GPRS       |
| <b>Report No.</b> | RXA1604-0072RF01R1 |
| <b>Issue Date</b> | May 13, 2016       |

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2(2015)/ FCC CFR 47 Part 22H(2015)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Handwritten signature of Lingling Kang in blue ink.

Performed by: Lingling Kang

Handwritten signature of Kai Xu in blue ink.

Approved by: Kai Xu



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### Summary of measurement results

| No.   | Test Type                               | Clause in FCC rules | Verdict |
|---|---|---------------------|---------|
| 1   | RF power output                         | 2.1046              | PASS    |
| 2   | Effective Radiated Power                | 22.913(a)(2)        | PASS    |
| 3   | Occupied Bandwidth                      | 2.1049              | PASS    |
| 4   | Band Edge Compliance                    | 2.1051 / 22.917(a)  | PASS    |
| 5   | Frequency Stability                     | 2.1055 / 22.355     | PASS    |
| 6   | Spurious Emissions at Antenna Terminals | 2.1051 / 22.917(a)  | PASS    |
| 7   | Radiates Spurious Emission              | 2.1053 / 22.917 (a) | PASS    |
| Date of Testing: April 25, 2016~ April 29, 2016 |   |                     |         |



## 1. Test Laboratory

### 1.1. Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd**). The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by CNAS or any government agencies.

### 1.2. Test facility

#### **CNAS (accreditation number:L2264)**

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

#### **FCC (recognition number is 428261)**

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

#### **IC (recognition number is 8510A)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

#### **VCCI (recognition number is C-4595, T-2154, R-4113, G-766)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

#### **A2LA (Certificate Number: 3857.01)**

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



### 1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
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## 2. General Description of Equipment under Test

### Client Information

|                      |  |
|----------------------|--|
| Applicant            | CalAmp   |
| Applicant address    | 2177 Salk Ave, Suite 200, Carlsbad, CA 92008 USA   |
| Manufacturer         | AsiaTelco Technologies Co.   |
| Manufacturer address | #289 Bisheng Road, Building-8, 3F, Zhangjiang Hi-Tech Park, Pudong, Shanghai, China-201204 |

### General Information

|   |                                 |           |           |
|---|---------------------------------|-----------|-----------|
| Model:  | LMU2640-GPRS                    |           |           |
| SN:   | 863779023034328                 |           |           |
| Hardware Version:   | P2                              |           |           |
| Software Version:   | LMU-2640_V07                    |           |           |
| Power Supply:   | DC Power                        |           |           |
| Antenna Type:   | Internal Antenna                |           |           |
| Test Mode(s):   | GSM 850;                        |           |           |
| Test Modulation:  | (GSM)GMSK;                      |           |           |
| GPRS Multislot Class:   | 12                              |           |           |
| Maximum E.R.P.  | GSM 850: 29.3 dBm               |           |           |
| Rated Power Supply Voltage:   | 12V                             |           |           |
| Extreme Voltage:  | Minimum: 7V    Maximum: 32V     |           |           |
| Extreme Temperature:  | Lowest: -30°C    Highest: +75°C |           |           |
| Operating Frequency Range(s)  | Band                            | Tx (MHz)  | Rx (MHz)  |
|   | GSM850                          | 824 ~ 849 | 869 ~ 894 |
| Note: The information of the EUT is declared by the manufacturer.<br>Please refer to the specifications or user manual for details. |                                 |           |           |



### **3. Applied Standards**

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

**FCC CFR47 Part 2 (2015)**

**FCC CFR 47 Part 22H (2015)**

**ANSI/TIA-603-D (2010)**

**KDB 971168 D01 Power Meas License Digital Systems v02r02**

## 4. Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (Z axis, vertical polarization) and the worst case was recorded.

All mode and data rates and positions were investigated.

The following testing in GSM is set based on the maximum RF Output Power.

Test modes are chosen to be reported as the worst case configuration below:

|                         | Test items                              | Modes/Modulation |
|-------------------------|---|------------------|
|                         |   | GSM 850          |
| Conducted<br>Test cases | RF power output                         | GSM/GPRS         |
|                         | Occupied Bandwidth                      | GSM/GPRS         |
|                         | Band Edge Compliance                    | GSM/GPRS         |
|                         | Frequency Stability                     | GSM/GPRS         |
|                         | Spurious Emissions at Antenna Terminals | GPRS             |
| Radiated<br>Test cases  | Effective Radiated Power                | GSM/GPRS         |
|                         | Radiates Spurious Emission              | GPRS             |



## 5. Test Case Results

### 5.1. RF Power Output

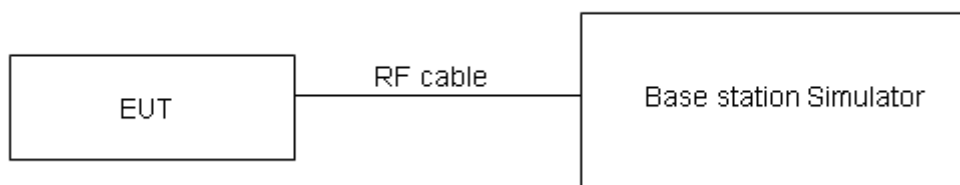
#### Ambient condition

| Temperature | Relative humidity |
|-------------|-------------------|
| 21°C ~25°C  | 40%~60%           |

#### Methods of Measurement

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

#### Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

#### Limits

No specific RF power output requirements in part 2.1046.

#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 0.4$  dB.

**Test Results**

| <b>GSM 850</b>  |          | <b>Conducted Power(dBm)</b> |              |              |
|---|----------|-----------------------------|--------------|--------------|
|   |          | Channel 128                 | Channel 190  | Channel 251  |
|   |          | 824.2 (MHz)                 | 836.6 (MHz)  | 848.8 (MHz)  |
| GSM   | Results  | 32.59                       | 32.52        | 32.45        |
| GPRS<br>(GMSK)  | 1TXslot  | <b>32.61</b>                | <b>32.52</b> | <b>32.48</b> |
|   | 2TXslots | 31.64                       | 31.54        | 31.51        |
|   | 3TXslots | 29.86                       | 29.76        | 29.72        |
|   | 4TXslots | 29.07                       | 28.94        | 28.90        |
| Note: 1) The maximum RF Output Power numbers are marks in bold.<br>2) The following testing in GPRS is set to 1TXslot based on the maximum RF Output Power. |          |                             |              |              |

## 5.2. Effective Radiated Power

### Ambient condition

| Temperature | Relative humidity |
|-------------|-------------------|
| 21°C ~25°C  | 40%~60%           |

### Methods of Measurement

The measurement procedures in TIA- 603-D are used.

1. The EUT was placed on a turntable with 1.5 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. GSM operating modes: Set RBW= 1MHz, VBW= 3MHz, RMS detector over burst;
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10.  $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

$P_s$  (dBm) : Input power to substitution antenna.

$G_s$  (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

$E_s = R_s + AF$

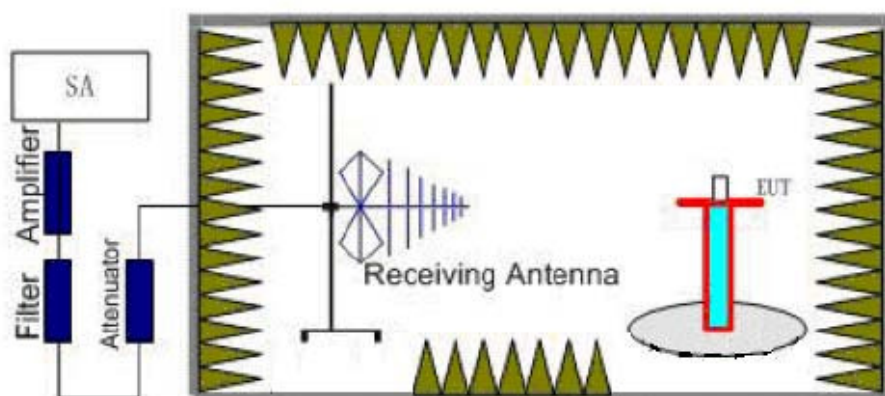
AF (dB/m) : Receive antenna factor

$R_t$  : The highest received signal in spectrum analyzer for EUT.

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

$EIRP = E.R.P + 2.15$

### Test Setup





## Limits

Rule Part 22.913(a) specifies that "Mobile/portable stations are limited to 7 watts ERP".

|       |                               |
|-------|-------------------------------|
| Limit | $\leq 7\text{ W}$ (38.45 dBm) |
|-------|-------------------------------|

## Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 1.19\text{ dB}$

**Test Results:**

| Mode        | Polarization | Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | Limit (dBm) | Conclusion |
|-------------|--------------|-----------------|----------|----------|----------|----------|-----------|-------------|------------|
| GSM<br>850  | H            | 824.2           | -17.97   | -45.53   | 0.00     | 1.06     | 28.62     | 38.45       | Pass       |
|             | H            | 836.6           | -17.70   | -45.38   | 0.00     | 1.24     | 28.92     | 38.45       | Pass       |
|             | H            | 848.8           | -17.45   | -45.37   | 0.00     | 1.38     | 29.30     | 38.45       | Pass       |
|             | V            | 824.2           | -23.95   | -45.65   | 0.00     | 1.06     | 22.76     | 38.45       | Pass       |
|             | V            | 836.6           | -23.49   | -45.46   | 0.00     | 1.24     | 23.21     | 38.45       | Pass       |
|             | V            | 848.8           | -23.61   | -45.49   | 0.00     | 1.38     | 23.26     | 38.45       | Pass       |
| GPRS<br>850 | H            | 824.2           | -22.85   | -47.10   | 0.00     | 1.06     | 25.31     | 38.45       | Pass       |
|             | H            | 836.6           | -22.98   | -47.38   | 0.00     | 1.24     | 25.64     | 38.45       | Pass       |
|             | H            | 848.8           | -23.07   | -47.37   | 0.00     | 1.38     | 25.68     | 38.45       | Pass       |
|             | V            | 824.2           | -26.49   | -46.92   | 0.00     | 1.06     | 21.49     | 38.45       | Pass       |
|             | V            | 836.6           | -26.51   | -46.83   | 0.00     | 1.24     | 21.56     | 38.45       | Pass       |
|             | V            | 848.8           | -26.55   | -47.05   | 0.00     | 1.38     | 21.88     | 38.45       | Pass       |

### 5.3. Occupied Bandwidth

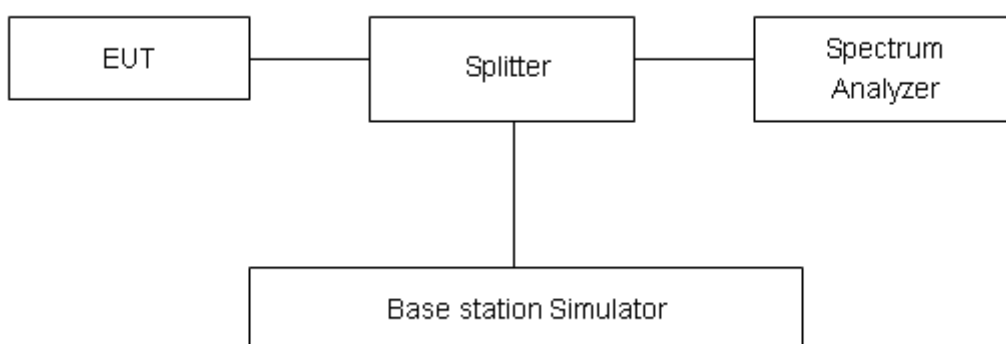
#### Ambient condition

| Temperature | Relative humidity |
|-------------|-------------------|
| 21°C ~25°C  | 40%~60%           |

#### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The occupied bandwidth is measured using spectrum analyzer. RBW is set to 3kHz, VBW is set to 10kHz for GSM 850, 99% power and -26dBc occupied bandwidths are recorded. Spectrum analyzer plots are included on the following pages.

#### Test Setup



#### Limits

No specific occupied bandwidth requirements in part 2.1049.

#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 624\text{Hz}$ .

**Test Result**

| Mode           | Channel | Frequency (MHz) | 99% Power Bandwidth (kHz) | -26dBc Bandwidth(kHz) |
|----------------|---------|-----------------|---------------------------|-----------------------|
| GSM 850 (GSM)  | 128     | 824.2           | 246.35                    | 304.3                 |
|                | 190     | 836.6           | 246.35                    | 304.3                 |
|                | 251     | 848.8           | 249.34                    | 317.2                 |
| GSM 850 (GPRS) | 128     | 824.2           | 246.38                    | 312.0                 |
|                | 190     | 836.6           | 244.60                    | 311.3                 |
|                | 251     | 848.8           | 248.33                    | 310.9                 |

GSM 850 CH-Low



GSM 850 GPRS CH-Low



GSM 850 CH-Middle



GSM 850 GPRS CH-Middle



GSM 850 CH-High



GSM 850 GPRS CH-High





## 5.4. Band Edge Compliance

### Ambient condition

| Temperature | Relative humidity |
|-------------|-------------------|
| 21°C ~25°C  | 40%~60%           |

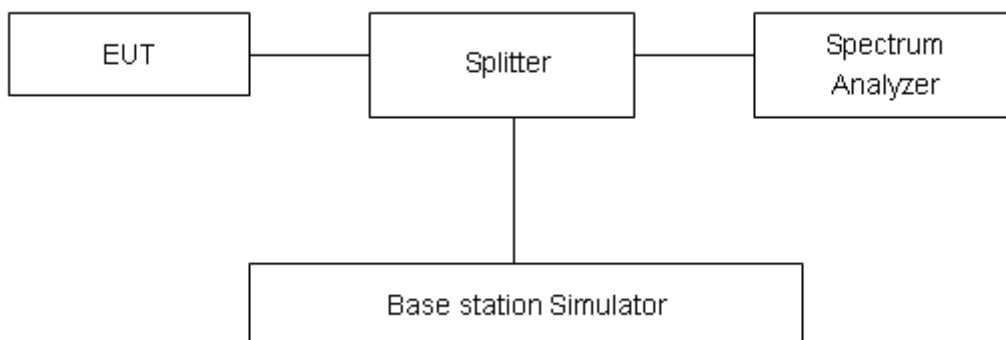
### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The band edge of the lowest and highest channels were measured. The average detector is used.

RBW is set to 3kHz, VBW is set to 10kHz for GSM 850,

Spectrum analyzer plots are included on the following pages.

### Test Setup



### Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10\log(P)$  dB.”

| Limit | -13 dBm |
|-------|---------|
|-------|---------|

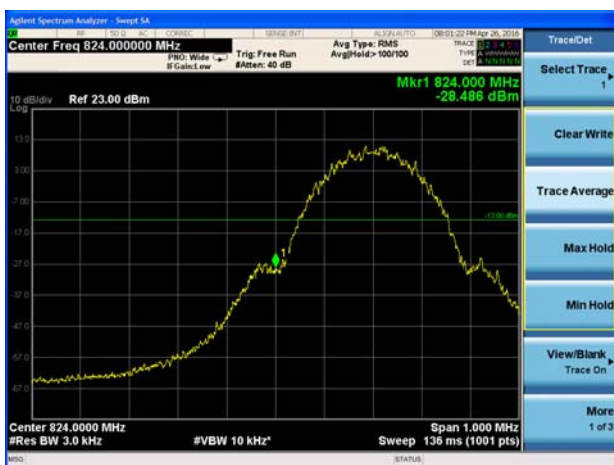
### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U=0.684$ dB.

# Test Result:

| Mode           | Carrier frequency (MHz) | Reference value (dBm) | Limit (dBm) | Conclusion |
|----------------|-------------------------|-----------------------|-------------|------------|
| GSM 850 (GSM)  | 824.0                   | -28.486               | -13         | PASS       |
|                | 849.0                   | -28.869               | -13         | PASS       |
| GSM 850 (GPRS) | 824.0                   | -26.933               | -13         | PASS       |
|                | 849.0                   | -28.006               | -13         | PASS       |

GSM 850 CH-Low



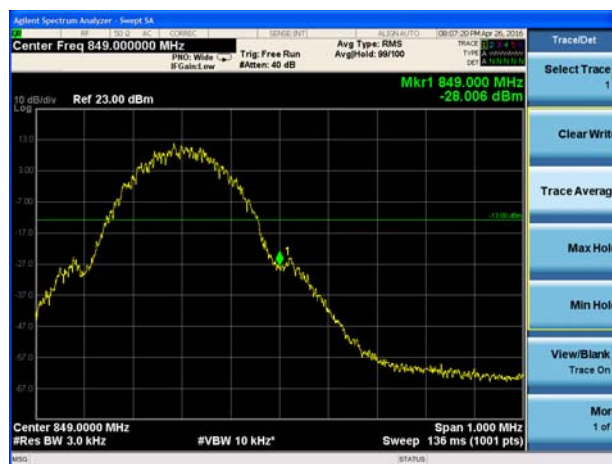
GSM 850 CH-High



GSM 850 GPRS CH-Low



GSM 850 GPRS CH-High



## 5.5. Frequency Stability

### Ambient condition

| Temperature | Relative humidity |
|-------------|-------------------|
| 21°C ~25°C  | 40%~60%           |

### Method of Measurement

#### 1. Frequency Stability (Temperature Variation)

The temperature inside the climate chamber is varied from -30°C to +50°C in 10°C step size,

(1) With all power removed, the temperature was decreased to 0°C and permitted to stabilize for three hours.

(2) Measure the carrier frequency with the test equipment in a “call mode”. These measurements should be made within 1 minute of powering up the mobile station, to prevent significant self warming.

(3) Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, un-powered, before making measurements.

#### 2. Frequency Stability (Voltage Variation)

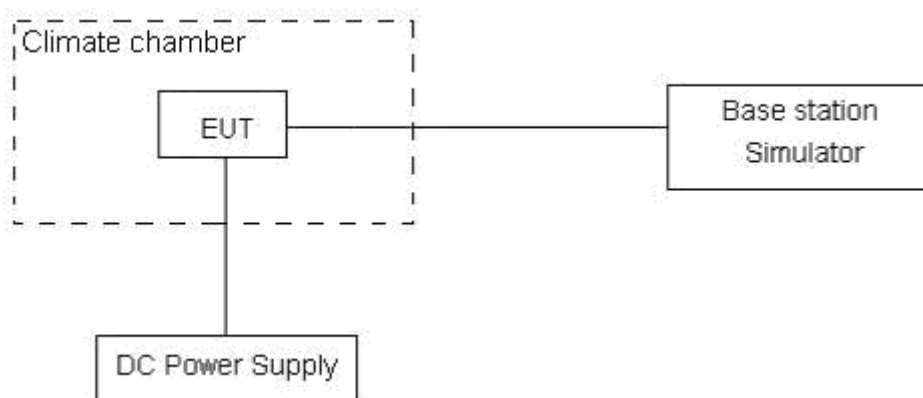
The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery-operating end point which shall be specified by the manufacturer.

This transceiver is specified to operate with an input voltage of between 7 V and 32 V, with a nominal voltage of 12 V.

### Test setup



## Limits

According to the Sec. 22.355, the frequency stability of the carrier shall be accurate to within 2.5 ppm of the received frequency for mobile stations.

|        |                        |
|--------|------------------------|
| Limits | $\leq 2.5 \text{ ppm}$ |
|--------|------------------------|

## Measurement Uncertainty

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor  $k = 3$ ,  $U = 0.01 \text{ ppm}$ .

## Test Result

| Mode                   | Test status | Test Results (ppm) |             | Limit (ppm) | Conclusion |
|------------------------|-------------|--------------------|-------------|-------------|------------|
|                        |             | GSM (GMSK)         | GPRS (GMSK) |             |            |
| GSM 850<br>Channel 190 | -30°C/12 V  | -0.0176            | -0.0313     | 2.5         | PASS       |
|                        | -20°C/12 V  | -0.0198            | -0.0545     | 2.5         | PASS       |
|                        | -10°C/12 V  | -0.017             | 0.0227      | 2.5         | PASS       |
|                        | 0°C/12 V    | -0.0182            | 0.0099      | 2.5         | PASS       |
|                        | 10°C/12 V   | -0.027             | 0.0128      | 2.5         | PASS       |
|                        | 20°C/12 V   | -0.0252            | -0.0263     | 2.5         | PASS       |
|                        | 30°C/12 V   | -0.0211            | 0.0203      | 2.5         | PASS       |
|                        | 40°C/12 V   | -0.0235            | -0.0136     | 2.5         | PASS       |
|                        | 50°C/12 V   | -0.0271            | -0.0169     | 2.5         | PASS       |
|                        | 20°C/7 V    | -0.0326            | -0.0343     | 2.5         | PASS       |
|                        | 20°C/32 V   | -0.0276            | -0.0304     | 2.5         | PASS       |

## 5.6. Spurious Emissions at Antenna Terminals

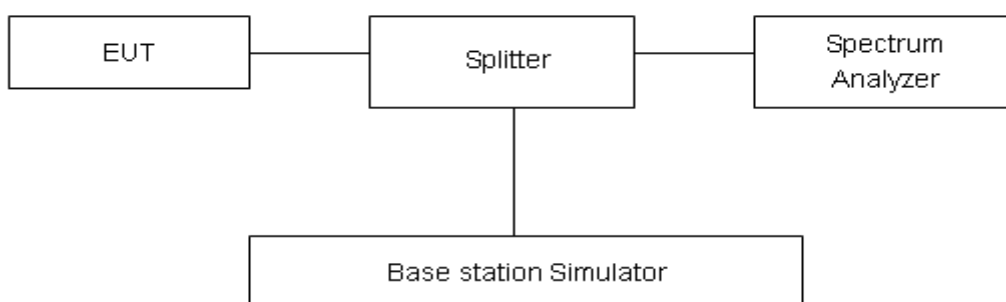
### Ambient condition

| Temperature | Relative humidity |
|-------------|-------------------|
| 21°C ~25°C  | 40%~60%           |

### Method of Measurement

The EUT was connected to Spectrum Analyzer and Base Station Simulator via power Splitter. The measurement is carried out using a spectrum analyzer. The spectrum analyzer scans from 30MHz to the 10th harmonic of the carrier. The peak detector is used. RBW and VBW are set to 100 kHz, Sweep is set to ATUO.

### Test setup



### Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.”

| Limit | -13 dBm |
|-------|---------|
|-------|---------|

**Measurement Uncertainty**

The assessed measurement uncertainty to ensure 99.75% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ .

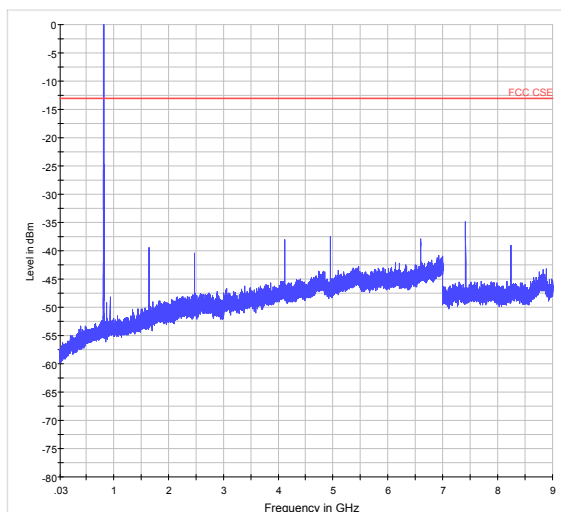
| Frequency     | Uncertainty |
|---------------|-------------|
| 100kHz-2GHz   | 0.684 dB    |
| 2GHz-12.75GHz | 1.407 dB    |

## Test Result

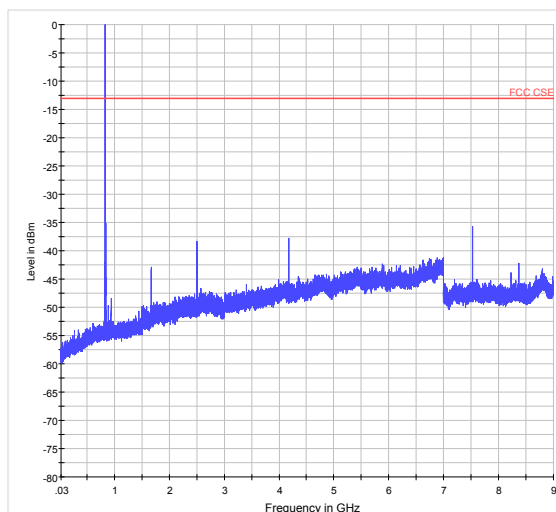
Sweep from 9 kHz to 30MHz, and the emissions more than 20 dB below the permissible value are not reported.

If disturbances were found more than 20dB below limit line, the mark is not required for the EUT.  
The signal beyond the limit is carrier.

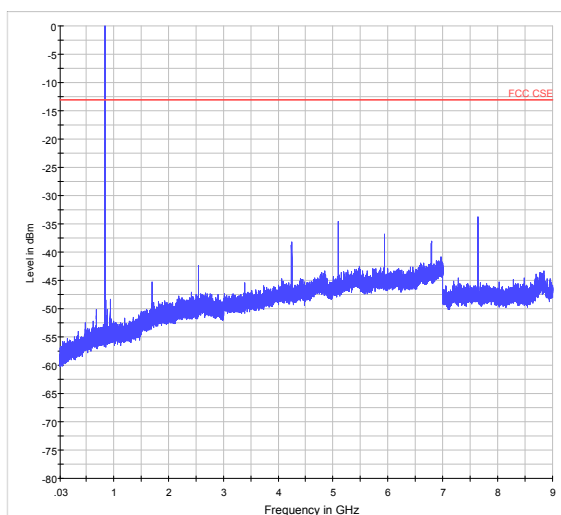
GSM 850 CH-Low 30MHz~9GHz



GSM 850 CH-Middle 30MHz~9GHz



GSM 850 CH-High 30MHz~9GHz



## 5.7. Radiates Spurious Emission

### Ambient condition

| Temperature | Relative humidity |
|-------------|-------------------|
| 21°C ~25°C  | 40%~60%           |

### Method of Measurement

The measurements procedures in TIA -603-D are used.

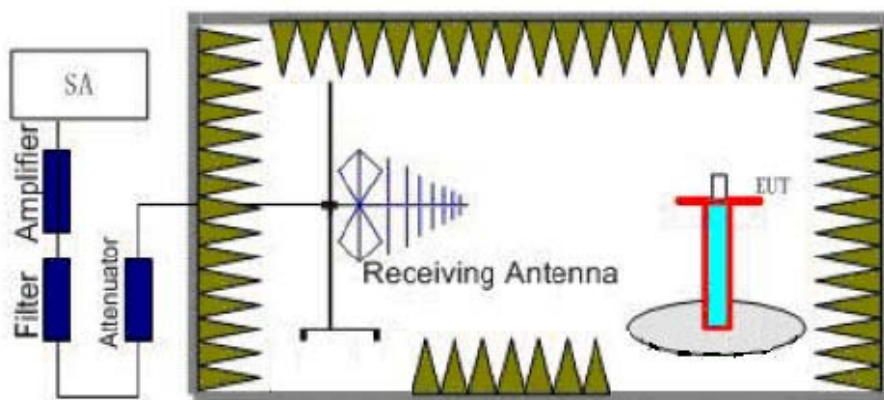
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment.

The emissions less than 20 dB below the permissible value are reported.

The procedure of Radiates Spurious Emission is as follows:

Step 1:

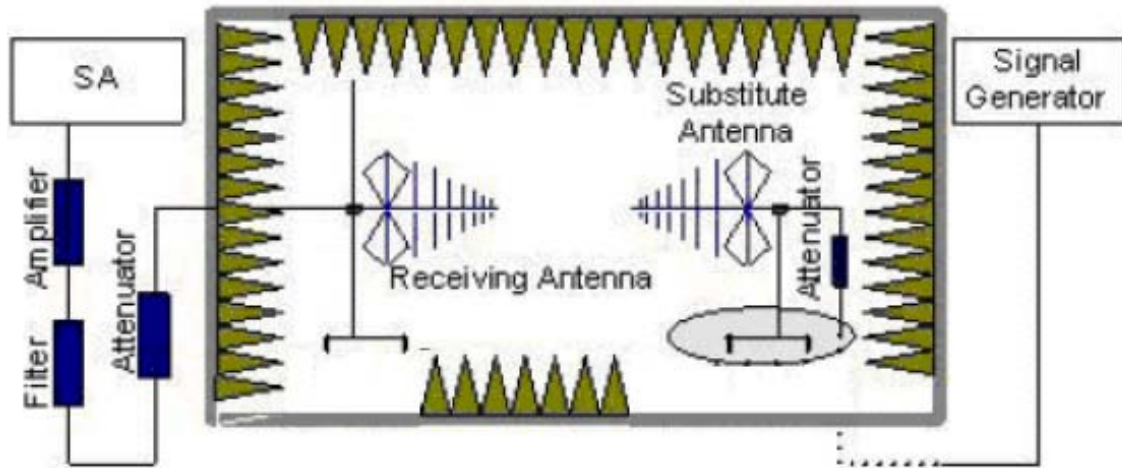
The measurement is carried out in the semi-anechoic chamber. EUT was placed on a 1.5 meters high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used while RBW and VBW are both set to 100kHz. During the measurement, the highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna moved up and down over a range from 1 to 4 meters in both horizontally and vertically polarized orientations. The test setup refers to figure below.



Step 2:

A dipole antenna shall be substituted in place of the EUT. The antenna will be driven by a signal generator with a adjustable S.G. applied through a Tx cable. Adjust the level of the signal generator output until the value of the receiver reach the previously recorded analyzer power level (LVL). Then The E.R.P. /E.I.R.P. of the EUT can be calculated through the level of the signal generator, Tx cable loss and the gain of the substitution antenna. The test setup refers to figure below.





E.R.P (peak power) =S.G. - Tx Cable loss + Substitution antenna gain – 2.15.

EIRP= E.R.P+2.15

### Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.”

|       |         |
|-------|---------|
| Limit | -13 dBm |
|-------|---------|

### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U = 3.55$  dB.

## Test Result

Receiver antenna polarization (horizontal and vertical), the worst emission was found in vertical polarization, and the worst case in vertical polarization was recorded.

### GPRS 850 CH-Low

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | ERP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|-----------------|-------------|-------------|---------------|
| 2        | 1648.1          | -57.75   | 2               | 10.15      | Vertical             | -49.60          | -13.00      | 36.60       | 180           |
| 3        | 2472.8          | -58.34   | 2.51            | 11.35      | Vertical             | -49.50          | -13.00      | 36.50       | 180           |
| 4        | 3297.0          | -61.15   | 4.2             | 10.85      | Vertical             | -54.50          | -13.00      | 41.50       | 45            |
| 5        | 4207.5          | -53.90   | 5.2             | 11.35      | Vertical             | -47.75          | -13.00      | 34.75       | 90            |
| 6        | 4945.2          | -53.33   | 5.5             | 11.95      | Vertical             | -46.88          | -13.00      | 33.88       | 0             |
| 7        | 5769.4          | -54.90   | 5.7             | 13.55      | Vertical             | -47.05          | -13.00      | 34.05       | 135           |
| 8        | 6593.6          | -58.76   | 6.3             | 13.75      | Vertical             | -51.31          | -13.00      | 38.31       | 45            |
| 9        | 7417.8          | -56.91   | 6.8             | 13.85      | Vertical             | -49.86          | -13.00      | 36.86       | 0             |
| 10       | 8242.0          | -57.30   | 6.9             | 14.25      | Vertical             | -49.95          | -13.00      | 36.95       | 135           |

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

### GPRS 850 CH-Middle

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | ERP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|-----------------|-------------|-------------|---------------|
| 2        | 1672.88         | -59.43   | 2               | 10.75      | Vertical             | -50.68          | -13.00      | 37.68       | 90            |
| 3        | 2509.88         | -48.64   | 2.51            | 11.05      | Vertical             | -40.10          | -13.00      | 27.10       | 45            |
| 4        | 3346.0          | -58.84   | 4.2             | 11.15      | Vertical             | -51.89          | -13.00      | 38.89       | 90            |
| 5        | 4182.8          | -52.36   | 5.2             | 11.15      | Vertical             | -46.41          | -13.00      | 33.41       | 225           |
| 6        | 5017.2          | -52.06   | 5.5             | 11.95      | Vertical             | -45.61          | -13.00      | 32.61       | 135           |
| 7        | 5853.4          | -54.97   | 5.7             | 13.55      | Vertical             | -47.12          | -13.00      | 34.12       | 315           |
| 8        | 6689.6          | -59.61   | 6.3             | 13.75      | Vertical             | -52.16          | -13.00      | 39.16       | 270           |
| 9        | 7525.8          | -57.80   | 6.8             | 13.85      | Vertical             | -50.75          | -13.00      | 37.75       | 225           |
| 10       | 8362.0          | -59.69   | 6.9             | 14.25      | Vertical             | -52.34          | -13.00      | 39.34       | 90            |

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.



## GPRS 850 CH-High

| Harmonic | Frequency (MHz) | SG (dBm) | Cable Loss (dB) | Gain (dBi) | Antenna Polarization | ERP Level (dBm) | Limit (dBm) | Margin (dB) | Azimuth (deg) |
|----------|-----------------|----------|-----------------|------------|----------------------|-----------------|-------------|-------------|---------------|
| 2        | 1697.3          | -62.48   | 2               | 10.15      | Vertical             | -54.33          | -13.00      | 41.33       | 135           |
| 3        | 2546.3          | -56.94   | 2.51            | 11.05      | Vertical             | -48.40          | -13.00      | 35.40       | 135           |
| 4        | 3395.3          | -60.78   | 4.2             | 11.15      | Vertical             | -53.83          | -13.00      | 40.83       | 135           |
| 5        | 4244.3          | -50.06   | 5.2             | 11.15      | Vertical             | -44.11          | -13.00      | 31.11       | 90            |
| 6        | 5092.8          | -52.57   | 5.5             | 11.95      | Vertical             | -46.12          | -13.00      | 33.12       | 135           |
| 7        | 5941.6          | -56.48   | 5.7             | 13.55      | Vertical             | -48.63          | -13.00      | 35.63       | 90            |
| 8        | 6790.4          | -61.14   | 6.3             | 13.75      | Vertical             | -53.69          | -13.00      | 40.69       | 45            |
| 9        | 7639.2          | -59.54   | 6.8             | 13.85      | Vertical             | -52.49          | -13.00      | 39.49       | 135           |
| 10       | 8488.0          | -60.59   | 6.9             | 14.25      | Vertical             | -53.24          | -13.00      | 40.24       | 225           |

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

## 6. Main Test Instruments

| Name                                 | Type         | Manufacturer | Serial Number | Calibration Date | Expiration Time |
|--------------------------------------|--------------|--------------|---------------|------------------|-----------------|
| Base Station Simulator               | CMW500       | R&S          | 113645        | 2015-05-22       | 2016-05-21      |
| Power Splitter                       | SHX-GF2-2-13 | Hua Xiang    | 10120101      | NA               | NA              |
| Spectrum Analyzer                    | E4445A       | Agilent      | MY46181146    | 2015-05-22       | 2016-05-21      |
| Spectrum Analyzer                    | N9010A       | Agilent      | MY47191109    | 2015-05-22       | 2016-05-21      |
| Universal Radio Communication Tester | E5515C       | Agilent      | MY48367192    | 2015-12-17       | 2016-12-16      |
| Signal Analyzer                      | FSV30        | R&S          | 100815        | 2015-12-17       | 2016-12-16      |
| Signal generator                     | SMB 100A     | R&S          | 102594        | 2015-05-22       | 2016-05-21      |
| Signal generator                     | SMR27        | R&S          | 100365        | 2015-05-22       | 2016-05-21      |
| EMI Test Receiver                    | ESCI         | R&S          | 100948        | 2015-05-22       | 2016-05-21      |
| Trilog Antenna                       | VUBL 9163    | SCHWARZBECK  | 9163-201      | 2014-12-06       | 2017-12-05      |
| Trilog Antenna                       | VUBL 9163    | SCHWARZBECK  | 9163-391      | 2014-12-06       | 2017-12-05      |
| Horn Antenna                         | HF907        | R&S          | 100126        | 2014-12-06       | 2017-12-05      |
| Horn Antenna                         | HF907        | R&S          | 100125        | 2014-12-06       | 2017-12-05      |
| Climatic Chamber                     | PT-30B       | Re Ce        | 20101891      | 2015-07-18       | 2018-07-17      |
| RF Cable                             | SMA 15cm     | Agilent      | 0001          | 2016-03-08       | 2016-05-07      |

\*\*\*\*\*END OF REPORT \*\*\*\*\*

## ANNEX A: EUT Appearance and Test Setup

### A.1 EUT Appearance



Front Side

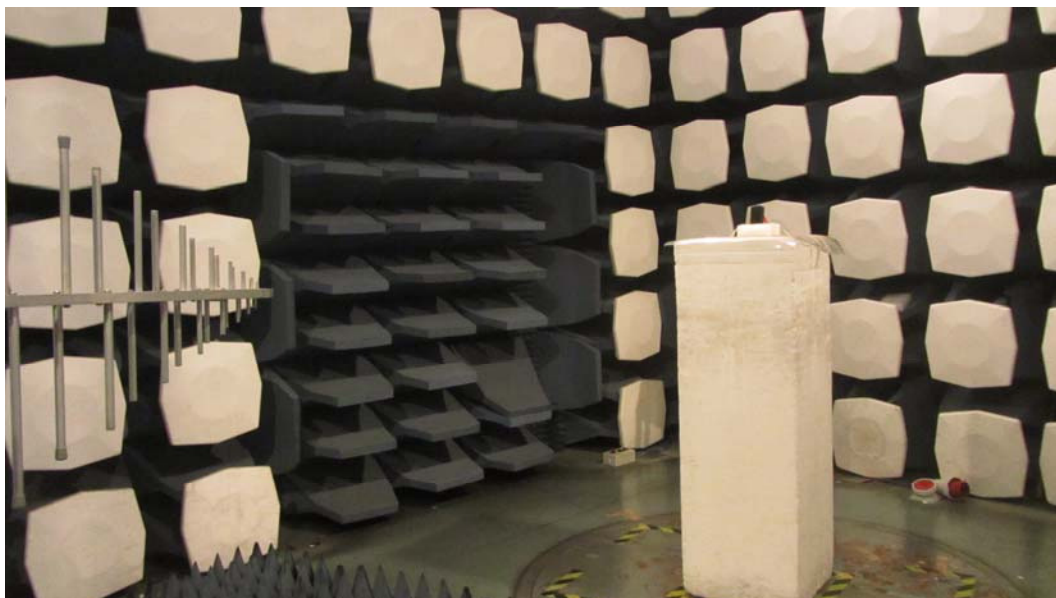


Back Side

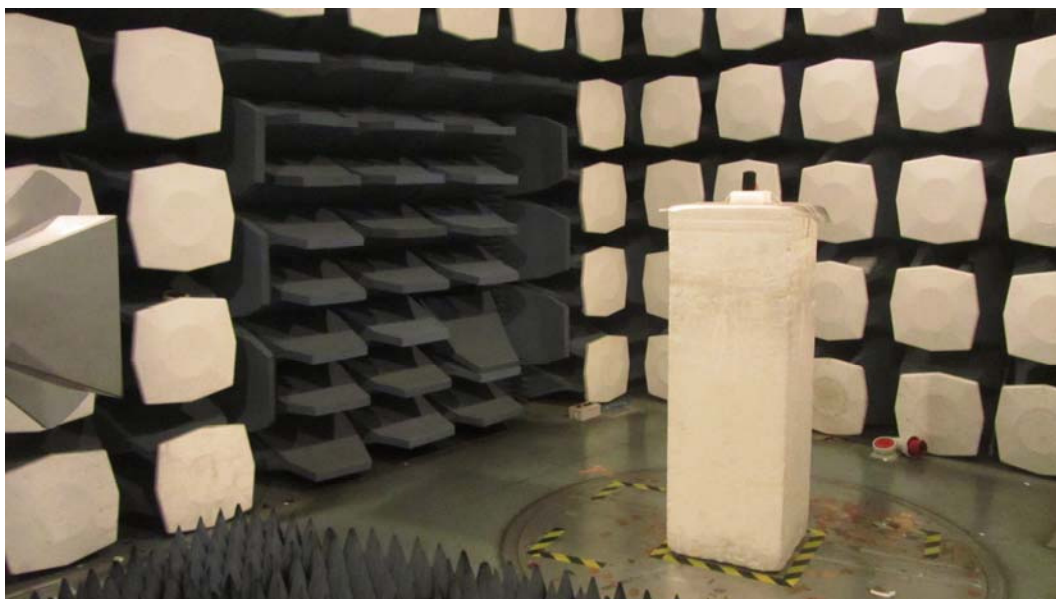
a: EUT

Picture 1 EUT

## A.2 Test Setup



a: below 1GHz



b: Above 1GHz

**Picture 2: Radiated Spurious Emissions Test setup**