



**47 CFR PART 22 SUBPART H & 24 SUBPART E**

# **TEST REPORT**

of

## **GSM /GPRS Dual-band Mobile Phone**

Marketing Name: OT-565A  
Model Name: B10CA  
Report No.: SH10060015R01  
FCC ID: RAD143

*prepared for*

**TCT Mobile Limited**

4/F, South Building, No. 2966, Jinke Road, Zhangjiang High-Tech Park, Pudong, Shanghai, 201203, P.R. China



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**Bluetooth®**

**CTIA Authorized Test Lab**  
LAB CODE 20081223-00

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## 1. TEST CERTIFICATION

Equipment under Test: GSM /GPRS Dual-band Mobile Phone

Marketing Name: OT-565A

Model Name: B10CA

FCC ID: RAD143

Applicant: TCT Mobile Limited

4/F, South Building, No. 2966, Jinke Road, Zhangjiang High-Tech  
Park, Pudong, Shanghai, 201203, P.R. China

Manufacturer: TCT Mobile Limited

4/F, South Building, No. 2966, Jinke Road, Zhangjiang High-Tech  
Park, Pudong, Shanghai, 201203, P.R. China

Test Standards: 47 CFR Part 2

47 CFR Part 22 Subpart H

47 CFR Part 24 Subpart E

Test Date(s): Jun 12, 2010 – July 7, 2010

Test Result: PASS

### \* We Hereby Certify That:

The equipment under test was tested by Shenzhen Electronic Product Quality Testing Center Morlab Laboratory. The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the requirement of related FCC rules.

The test results of this report only apply for the tested sample equipment identified above. The test report shall be invalid without all the signatures of the test engineer, the reviewer and the approver.

Tested by:

*Huangyunlong*

Huangyunlong

Dated: 2010-7-15

Reviewed by:

*Zhang Jun*

Zhang Jun

Dated: 2010-7-15

Approved by:

*Wei Bei*

Wei Bei

Dated: 2010-7-15



## 2. GENERAL INFORMATION

## 2.1 EUT Description

|                            |                                                                                                                                                                                                                                                                                                                          |  |  |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| EUT Type.....:             | GSM /GPRS Dual-band Mobile Phone                                                                                                                                                                                                                                                                                         |  |  |
| Marketing Name.....:       | OT-565A                                                                                                                                                                                                                                                                                                                  |  |  |
| Serial No.....:            | (n.a)                                                                                                                                                                                                                                                                                                                    |  |  |
| IMEI .....                 | 012388000025614                                                                                                                                                                                                                                                                                                          |  |  |
| Hardware Version .....     | PIO                                                                                                                                                                                                                                                                                                                      |  |  |
| Software Version .....     | D12                                                                                                                                                                                                                                                                                                                      |  |  |
| Frequency Range .....      | GSM 850MHz:<br>Tx: 824.20 - 848.80MHz (at intervals of 200kHz);<br>Rx: 869.20 - 893.80MHz (at intervals of 200kHz)<br>GSM 1900MHz:<br>Tx: 1850.20 - 1909.80MHz (at intervals of 200kHz);<br>Rx: 1930.20 - 1989.80MHz (at intervals of 200kHz)                                                                            |  |  |
| Modulation Type.....:      | GMSK                                                                                                                                                                                                                                                                                                                     |  |  |
| Power Supply.....:         | Battery<br>Brand name: BYD<br>Mode Name.: CAB30M0000C1<br>Capacitance: 650mAh<br>Rated voltage: 3.7V<br>Charge limited: 4.2V<br>Manufacturer: BYD CO LTD<br>YAN AN RD LONGGANG, KUICHONG<br>SHENZHEN,GUANGDONG 518119 CHINA                                                                                              |  |  |
| Ancillary Equipments.....: | AC Adapter (Charger for Battery)<br>Brand name: ALCATEL<br>Mode Name.: WUS350mA5V00-00<br>Rated Input: AC 100~240V, 150mA, 50/60Hz<br>Rated Output: DC 5V, 350 mA,<br>Manufacturer: HUIZHOU BYD ELECTRONIC CO ., LTD<br>Xiangshui River, Economic Development<br>Zone ,Daya Bay ,Huizhou<br>Guangdong,516083 ,P.R. China |  |  |

- Note 1:* The transmitter (Tx) frequency arrangement of the GSM 850MHz band used by the EUT can be represented with the formula  $F(n)=824.2+0.2*(n-128)$ ,  $128 \leq n \leq 251$ ; the lowest, middle, highest channel numbers (ARFCHs) used and tested in this report are separately 128 (824.2MHz), 190 (836.6MHz) and 251 (848.8MHz).
- Note 2:* The transmitter (Tx) frequency arrangement of the PCS 1900MHz band used by the EUT can be represented with the formula  $F(n)=1850.2+0.2*(n-512)$ ,  $512 \leq n \leq 810$ ; the lowest, middle and highest channel numbers (ARFCHs) used and tested in this report are separately 512 (1850.2MHz), 661 (1880.0MHz) and 810 (1909.8MHz).
- Note 3:* For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

## 2.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 2, Part 22 and Part 24 for the EUT FCC ID Certification:

| No. | Identity                            | Document Title                                                                                                                                                      |
|-----|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 47 CFR Part 2<br>(10-1-05 Edition)  | Frequency Allocations and Radio Treaty Matters; General Rules and Regulations                                                                                       |
| 2   | 47 CFR Part 22<br>(10-1-05 Edition) | Public Mobile Services                                                                                                                                              |
| 3   | 47 CFR Part 24<br>(10-1-05 Edition) | Personal Communications Services                                                                                                                                    |
| 4   | ANSI/TIA/EIA-603-C (2004)           | Land Mobile FM or PM - Communications Equipment - Measurement and Performance Standards                                                                             |
| 5   | ANSI C63.4-2009                     | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |

Test detailed items/section required by FCC rules and results are as below:

| No. | Section                        | Description                           | Result |
|-----|--------------------------------|---------------------------------------|--------|
| 1   | 2.106<br>22.905<br>24.229      | Frequencies                           | PASS   |
| 2   | 2.1046                         | Conducted RF Output Power             | PASS   |
| 3   | 2.1049                         | 20dB Occupied Bandwidth               | PASS   |
| 4   | 2.1055<br>22.355<br>24.235     | Frequency Stability                   | PASS   |
| 5   | 2.1051 2.1057<br>22.917 24.238 | Conducted Out of Band Emissions       | PASS   |
| 6   | 2.1051 2.1057<br>22.917 24.238 | Band Edge                             | PASS   |
| 7   | 22.913 24.232                  | Transmitter Radiated Power (EIPR/ERP) | PASS   |
| 8   | 2.1053 2.1057<br>22.917 24.238 | Radiated Out of Band Emissions        | PASS   |

## 2.3 Facilities and Accreditations

### 2.3.1 Facilities

Shenzhen Electronic Product Quality Testing Center Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

All measurement facilities used to collect the measurement data are located at Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen 518055 CHINA. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

### 2.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

|                             |         |
|-----------------------------|---------|
| Temperature ( °C):          | 20 - 25 |
| Relative Humidity (%):      | 40 - 60 |
| Atmospheric Pressure (kPa): | 96      |



### 3. 47 CFR PART 2, PART 22H & 24E REQUIREMENTS

#### 3.1 Frequencies

##### 3.1.1 Requirement

According to FCC section 22.905, the frequency blocks assignment for the cellular radiotelephone service is listed as below:

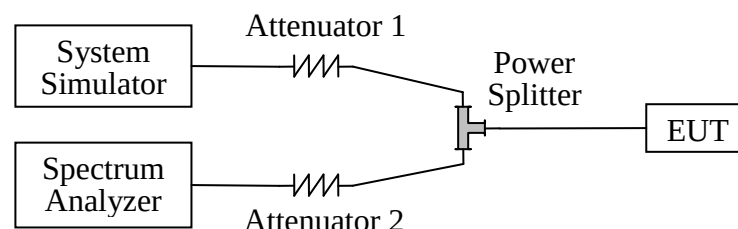
- (a) Channel Block A:  
Mobile 824 - 835MHz, Base 869 - 880MHz;  
Mobile 845 - 846.5MHz, Base 890 - 891.5MHz
- (b) Channel Block B:  
Mobile 835 - 845 MHz, Base 880 - 890MHz;  
Mobile 846.5 - 849 MHz, Base 891.5 - 894MHz

According to FCC section 24.229, the frequencies available in the Broadband PCS services are listed as below, in accordance with the frequency allocations table of FCC section 2.106.

- (a) The following frequency blocks are available for assignment on an MTA basis:  
Block A: 1850 - 1865MHz paired with 1930 - 1945MHz;  
Block B: 1870 - 1885MHz paired with 1950 - 1965MHz.
- (b) The following frequency blocks are available for assignment on a BTA basis:  
Block C: 1895 - 1910 MHz paired with 1975 - 1990MHz;  
Block D: 1865 - 1870 MHz paired with 1945 - 1950MHz;  
Block E: 1885 - 1890 MHz paired with 1965 - 1970MHz;  
Block F: 1890 - 1895 MHz paired with 1970 - 1975MHz.

##### 3.1.2 Test Description

###### 1. Test Setup:



The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna

terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS.

## 2. Equipments List:

| Description       | Manufacturer    | Model  | Serial No. | Cal. Date | Cal. Due |
|-------------------|-----------------|--------|------------|-----------|----------|
| SS                | Agilent         | E5515C | GB46040102 | 2009.10   | 1year    |
| Spectrum Analyzer | Rohde & Schwarz | FSP30  | 101020     | 2009.10   | 1year    |
| Power Splitter    | HP              | 11667B | 00164      | (n.a.)    | (n.a.)   |
| Attenuator 1      | Resnet          | 10dB   | (n.a.)     | (n.a.)    | (n.a.)   |
| Attenuator 2      | Resnet          | 10dB   | (n.a.)     | (n.a.)    | (n.a.)   |

### 3.1.3 Test Result

The Tx frequency arrangement of the GSM 850MHz band employed by the EUT should be from 824.2MHz to 848.8MHz (the corresponding frequency block is from 824MHz to 849MHz), and Tx frequency arrangement of the PCS 1900MHz band employed by the EUT should be from 1850.2MHz to 1909.8MHz (the corresponding frequency block is from 1850MHz to 1910MHz). Here the lowest and highest channels are tested to verify the EUT's using the frequency block required.

#### 1. Test Verdict:

The required frequency block is employed legally, the verdict is PASS.

| Band            | Channel | Frequency (MHz) | Measured Carrier (dBm) |
|-----------------|---------|-----------------|------------------------|
| GSM<br>850MHz   | 128     | 824.2           | 32.91                  |
|                 | 251     | 848.8           | 32.98                  |
| GSM<br>1900MHz  | 512     | 1850.2          | 29.99                  |
|                 | 810     | 1909.8          | 29.91                  |
| GPRS<br>850MHz  | 128     | 824.2           | 32.88                  |
|                 | 251     | 848.8           | 32.92                  |
| GPRS<br>1900MHz | 512     | 1850.2          | 27.64                  |
|                 | 810     | 1909.8          | 27.40                  |

## 3.2 Conducted RF Output Power

### 3.2.1 Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

### 3.2.2 Test Description

See section 3.1.2 of this report.

### 3.2.3 Test Result

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT. For the GSM 850MHz operates at PCL=5 (where Power Class is 4), the rated conducted RF output power is 33dBm within the tolerance of  $\pm 3$ dB, and For the GSM 1900MHz operates at PCL=0 (where Power Class is 1), the rated conducted RF output power is 30dBm within the tolerance of  $\pm 3$ dB. GPRS850 is test in 1down1up, GPRS1900 is test in 1down2up

#### 1. Test Verdict:

| Band         | Channel | Measured Output Power | Rated Output Power |                | Verdict |
|--------------|---------|-----------------------|--------------------|----------------|---------|
|              |         | dBm                   | dBm                | Tolerance (dB) |         |
| GSM 850MHz   | 128     | 32.91                 | 33                 | $\pm 3$        | PASS    |
|              | 190     | 33.02                 |                    |                | PASS    |
|              | 251     | 32.98                 |                    |                | PASS    |
| GSM 1900MHz  | 512     | 29.99                 | 30                 | $\pm 3$        | PASS    |
|              | 661     | 29.94                 |                    |                | PASS    |
|              | 810     | 29.91                 |                    |                | PASS    |
| GPRS 850MHz  | 128     | 32.88                 | 33                 | $\pm 3$        | PASS    |
|              | 190     | 32.98                 |                    |                | PASS    |
|              | 251     | 32.92                 |                    |                | PASS    |
| GPRS 1900MHz | 512     | 27.64                 | 30                 | $\pm 3$        | PASS    |
|              | 661     | 27.43                 |                    |                | PASS    |
|              | 810     | 27.40                 |                    |                | PASS    |

### 3.3 20dB Occupied Bandwidth

#### 3.3.1 Definition

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as the 99% emission bandwidth, or 20dB bandwidth ( $10 \cdot \log 1\% = 20\text{dB}$ ) taking the total RF output power as reference.

#### 3.3.2 Test Description

See section 3.1.2 of this report.

#### 3.3.3 Test Verdict

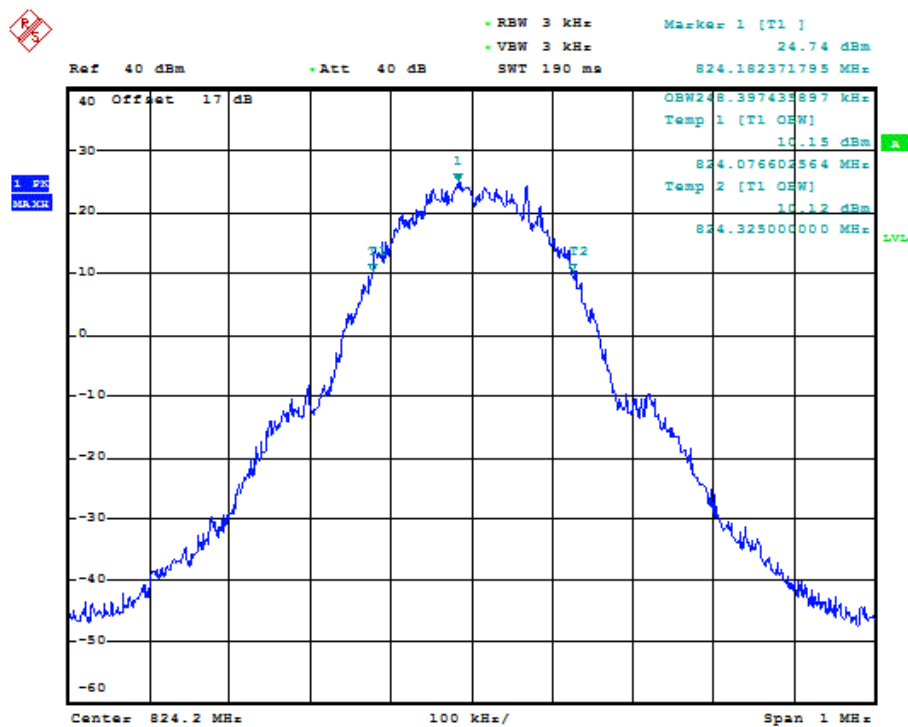
Here the lowest, middle and highest channels are tested to record the 99% occupied bandwidth, it's about 300kHz. All modes are tested, including (GSM850 GPRS and PCS1900 GPRS ).

##### 1. Test Verdict:

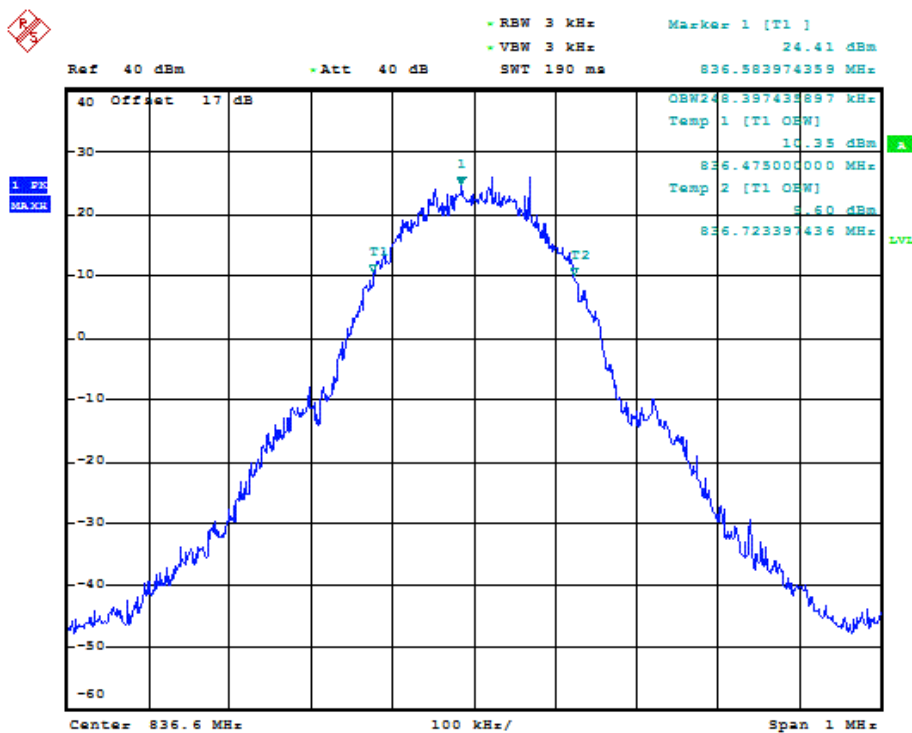
| Band        | Channel | Measured 99% Occupied Bandwidth (kHz) | Refer to Plot |
|-------------|---------|---------------------------------------|---------------|
| GSM 850MHz  | 128     | 248                                   | Plot A3       |
|             | 190     | 248                                   | Plot B3       |
|             | 251     | 250                                   | Plot C3       |
| GSM 1900MHz | 512     | 246                                   | Plot D3       |
|             | 661     | 250                                   | Plot E3       |
|             | 810     | 248                                   | Plot F3       |

| Band         | Channel | Measured 99% Occupied Bandwidth (kHz) | Refer to Plot |
|--------------|---------|---------------------------------------|---------------|
| GPRS 850MHz  | 128     | 251                                   | Plot A3.1     |
|              | 190     | 248                                   | Plot B3.1     |
|              | 251     | 248                                   | Plot C3.1     |
| GPRS 1900MHz | 512     | 250                                   | Plot D3.1     |
|              | 661     | 245                                   | Plot E3.1     |
|              | 810     | 251                                   | Plot F3.1     |

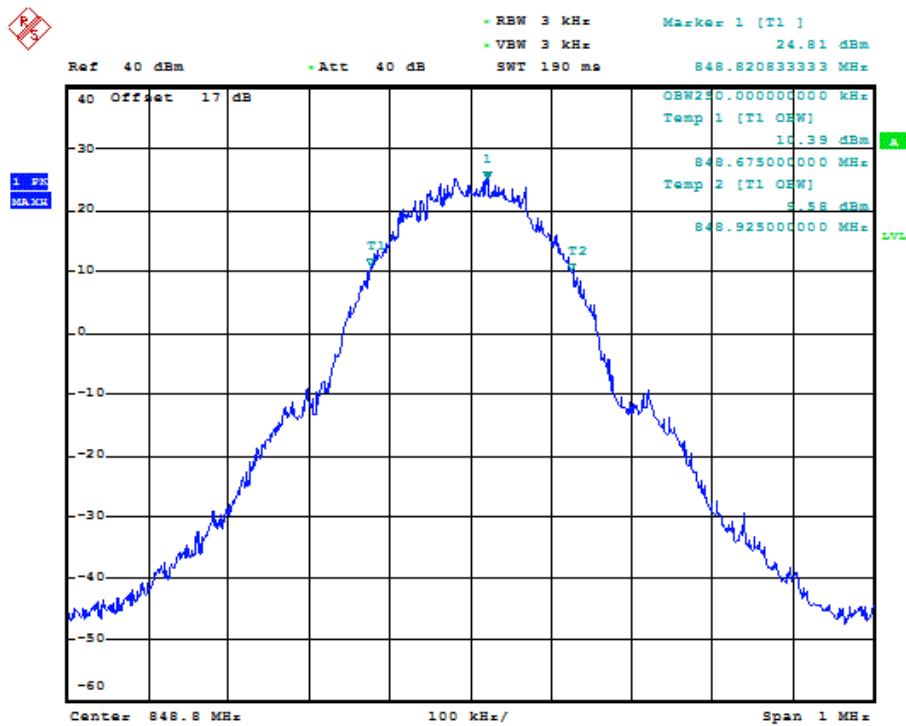
## 2. Test Plot:



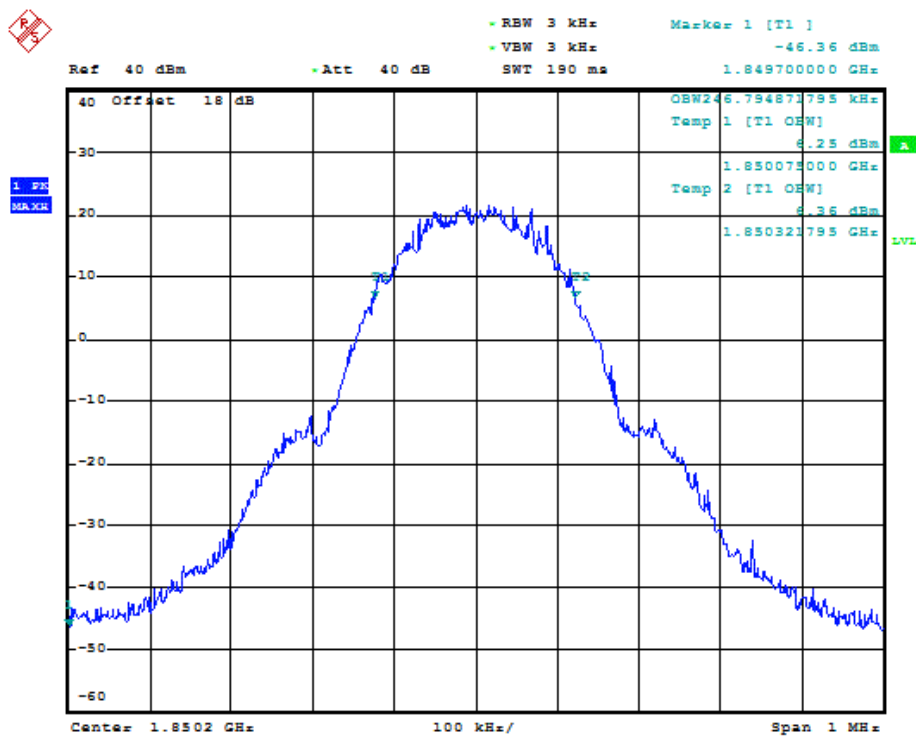
(Plot A3: GSM 850MHz Channel = 128)



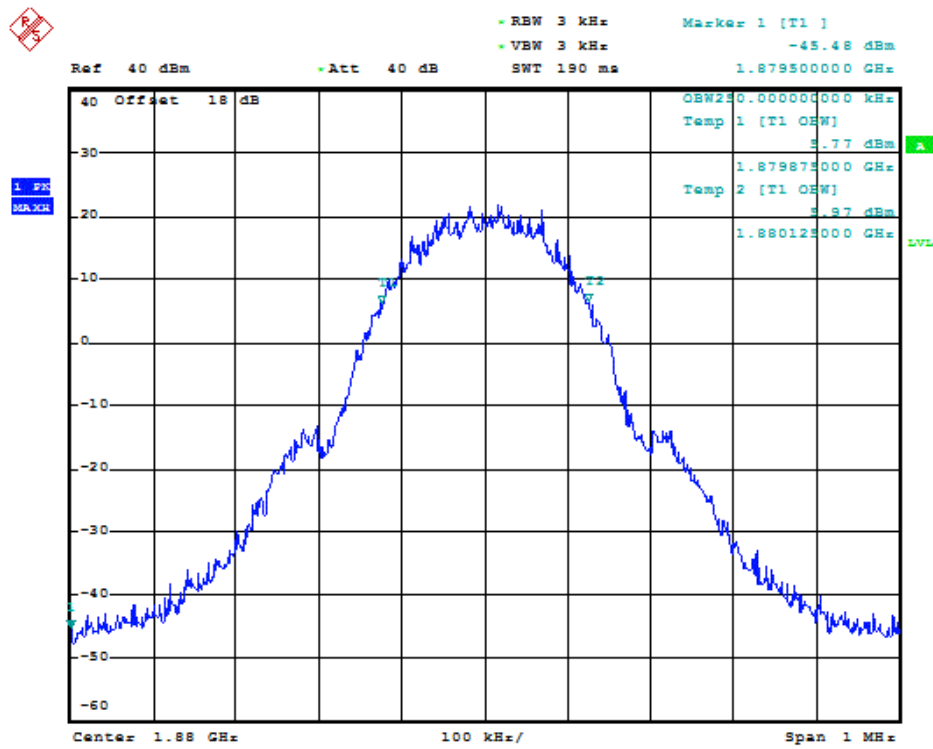
(Plot B3: GSM 850MHz Channel = 190)



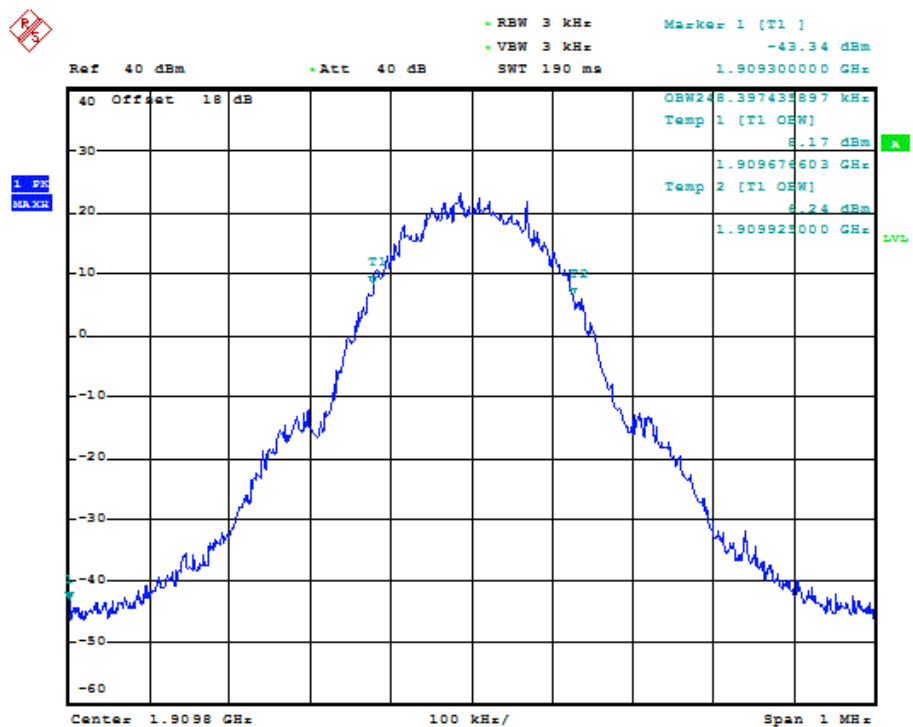
(Plot C3: GSM 850MHz Channel = 251)



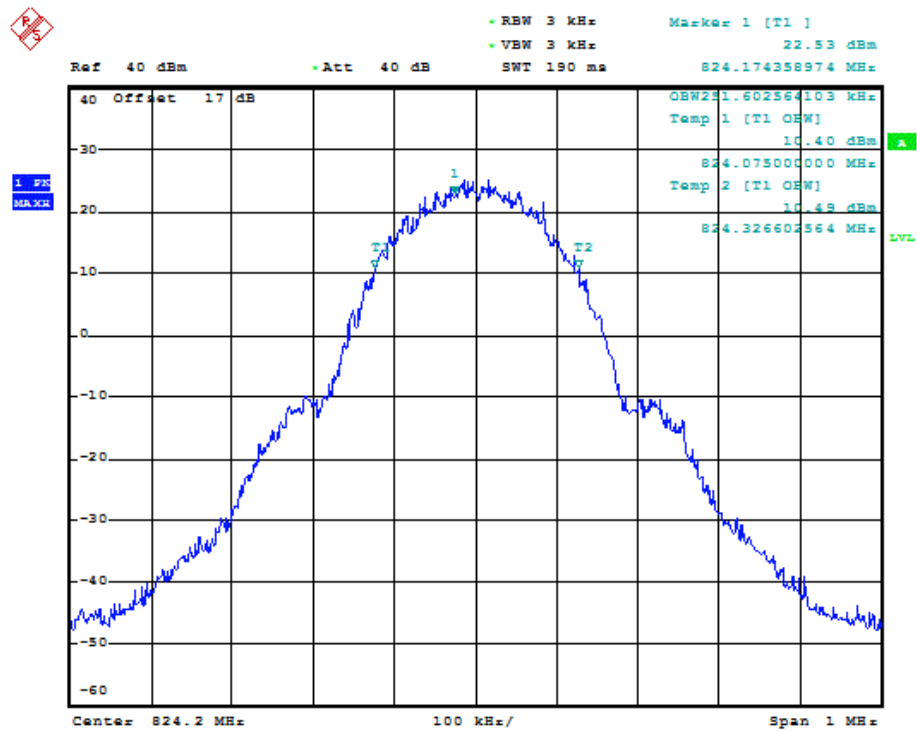
(Plot D3: GSM 1900MHz Channel = 512)



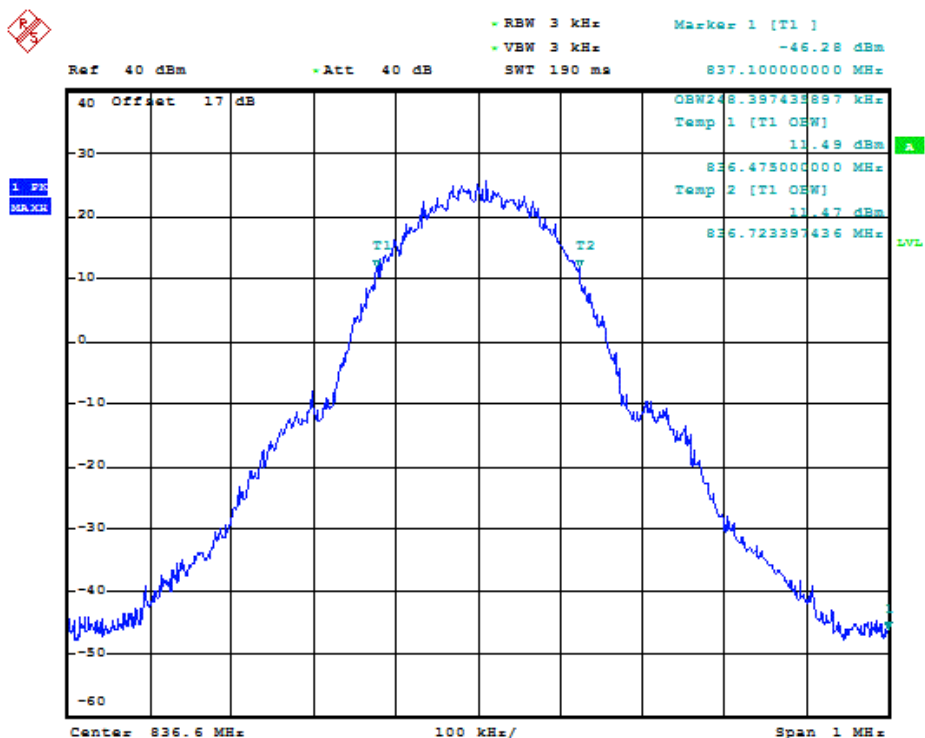
(Plot E3: GSM 1900MHz Channel = 661)



(Plot F3: GSM 1900MHz Channel = 810)

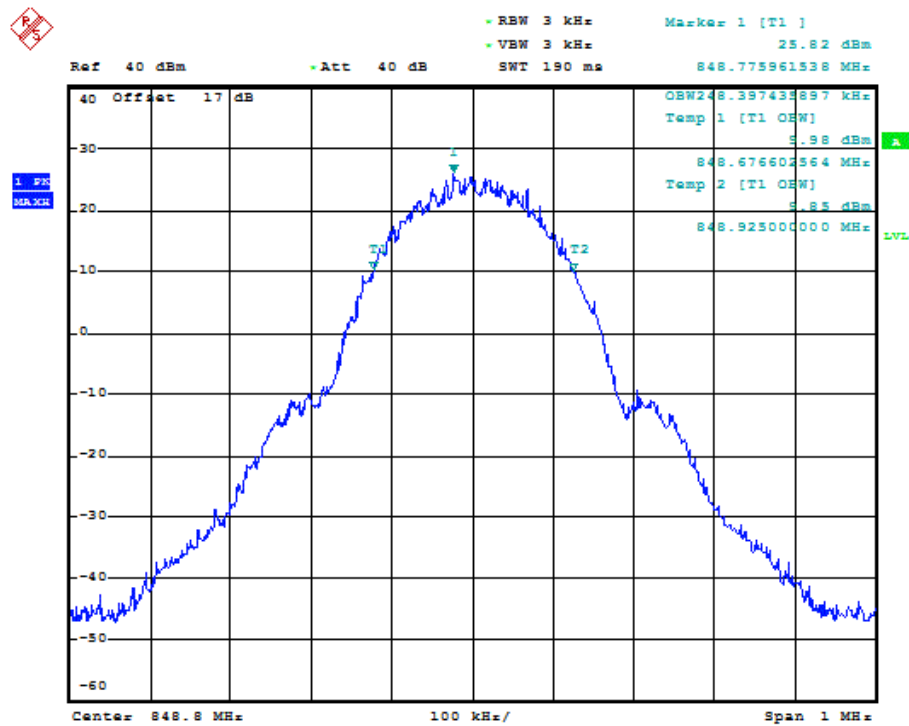


(Plot A3.1: GPRS 850MHz Channel = 128)

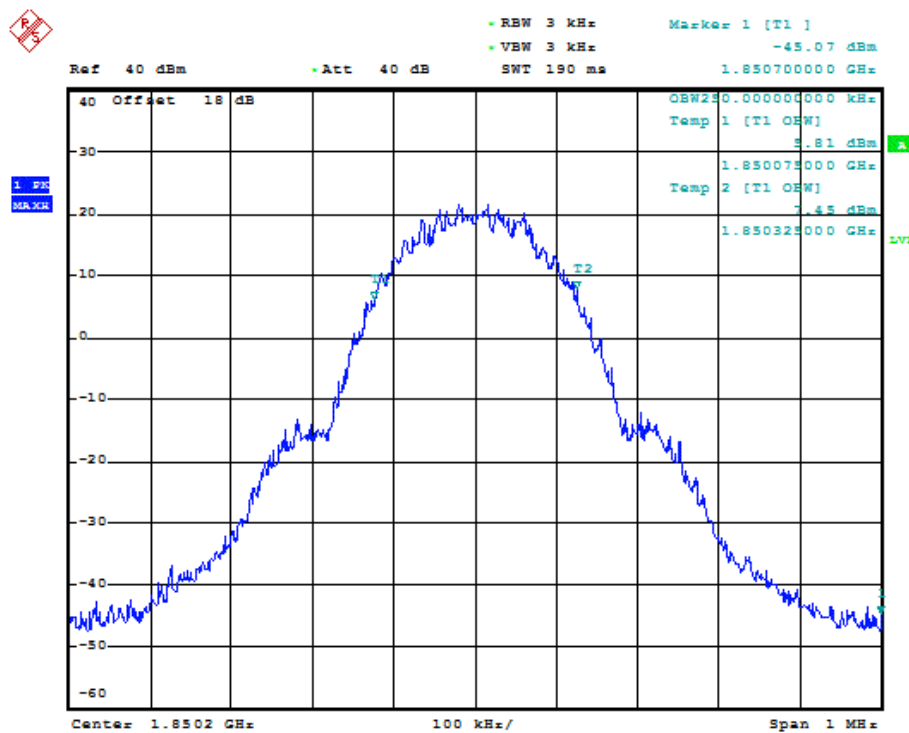


(Plot B3.1: GPRS 850MHz Channel = 190)

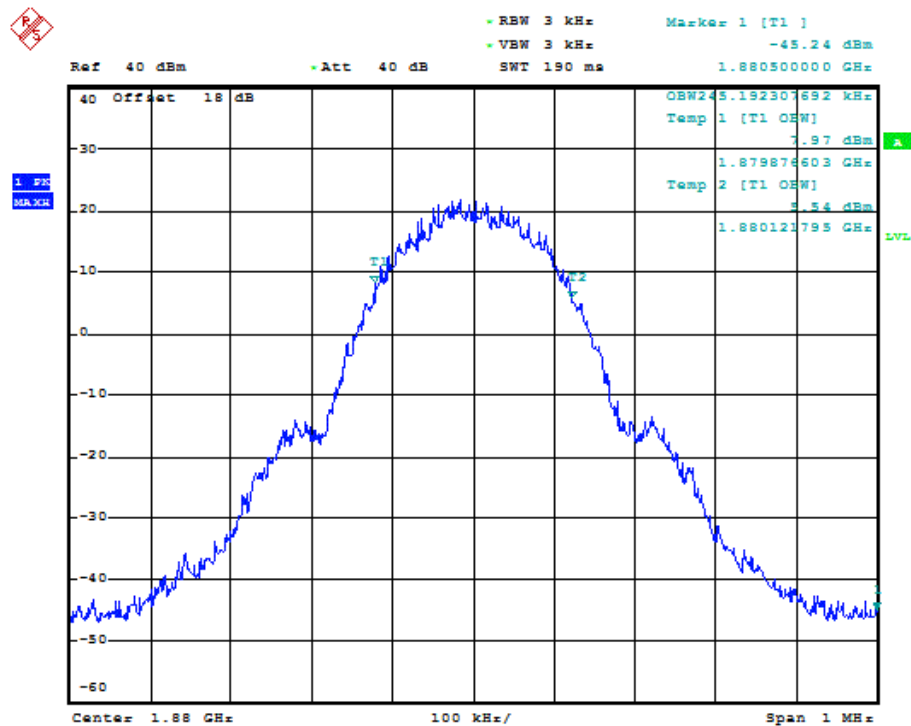




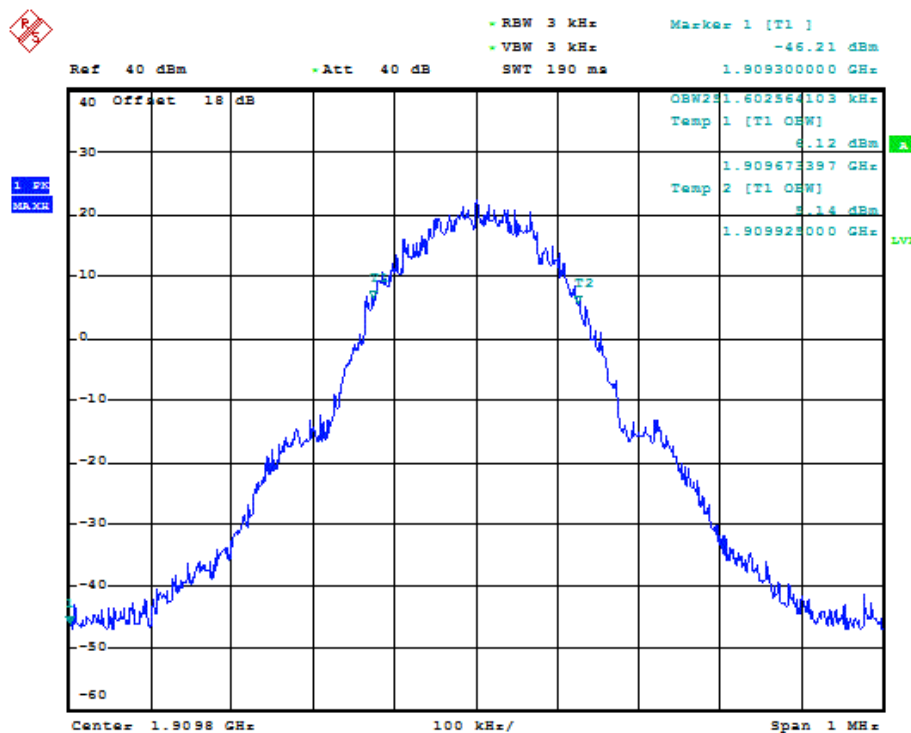
(Plot C3.1: GPRS 850MHz Channel = 251)



(Plot D3.1: GPRS 1900MHz Channel = 512)



(Plot E3.1: GPRS 1900MHz Channel = 661)



(Plot F3.1: GPRS 1900MHz Channel = 810)

### 3.4 Frequency Stability

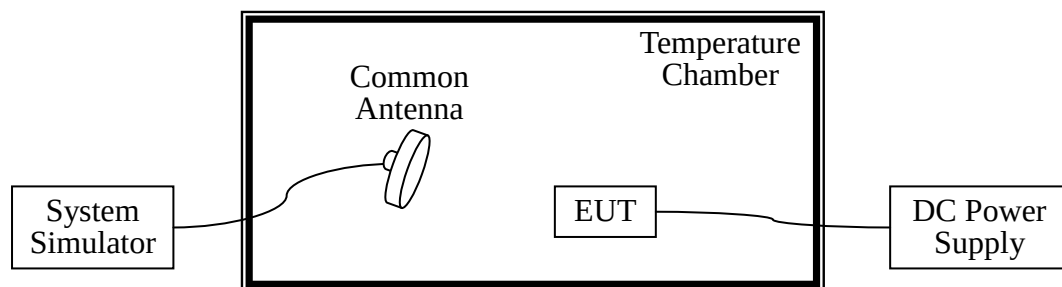
#### 3.4.1 Requirement

According to FCC section 22.355 and FCC section 24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

- (a) The temperature is varied from -30 °C to +50 °C at intervals of not more than 10 °C.
- (b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

#### 3.4.2 Test Description

##### 1. Test Setup:



The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber. The EUT is commanded by the System Simulator (SS) to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the SS via a Common Antenna.

##### 2. Equipments List:

| Description         | Manufacturer              | Model      | Serial No. | Cal. Date | Cal. Due |
|---------------------|---------------------------|------------|------------|-----------|----------|
| SS                  | Agilent                   | E5515C     | GB46040102 | 2009.10   | 1year    |
| DC Power Supply     | Good Will                 | GPS-3030DD | EF920938   | 2009.10   | 2year    |
| Temperature Chamber | YinHe Experimental Equip. | HL4003T    | (n.a.)     | 2009.10   | 1year    |

#### 3.4.3 Test Verdict

The nominal, highest and lowest extreme voltages are separately 3.7VDC, 4.2VDC and 3.6VDC, which are specified by the applicant; the normal temperature here used is 25 °C. The frequency

deviation limit is  $\pm 2.5$ ppm. All modes are tested, including (GSM850 GPRS and PCS1900 GPRS ). only the GSM and GPRS mode are recorded in this report.

| Band        | Test Conditions |                  | Frequency Deviation |                 |                |                 |               |                 | Verdict                   |
|-------------|-----------------|------------------|---------------------|-----------------|----------------|-----------------|---------------|-----------------|---------------------------|
|             | Power (VDC)     | Temperature (°C) | Low Channel         |                 | Middle Channel |                 | High Channel  |                 | Limit $\pm 2.5$ ppm (ppm) |
|             |                 |                  | Dev. Freq. Hz       | Deviation (ppm) | Dev. Freq. Hz  | Deviation (ppm) | Dev. Freq. Hz | Deviation (ppm) |                           |
| GSM 850MHz  | 3.7             | -30              | -4                  | 0               | 4              | 0               | -4            | 0               | PASS                      |
|             |                 | -20              | 5                   | 0               | 4              | 0               | -6            | 0               |                           |
|             |                 | -10              | 6                   | 0               | 5              | 0               | -4            | 0               |                           |
|             |                 | 0                | 1                   | 0               | 6              | 0               | -3            | 0               |                           |
|             |                 | +10              | 7                   | 0               | -3             | 0               | 4             | 0               |                           |
|             |                 | +20              | -4                  | 0               | 1              | 0               | -7            | 0               |                           |
|             |                 | +30              | 3                   | 0               | -6             | 0               | 2             | 0               |                           |
|             |                 | +40              | -8                  | 0               | -7             | 0               | 3             | 0               |                           |
|             |                 | +50              | 1                   | 0               | -3             | 0               | -4            | 0               |                           |
|             | 4.2             | +25              | -2                  | 0               | 6              | 0               | -6            | 0               | PASS                      |
|             | 3.6             | +25              | 7                   | 0               | -3             | 0               | -7            | 0               |                           |
| GSM 1900MHz | 3.7             | -30              | 3                   | 0               | 3              | 0               | 2             | 0               | PASS                      |
|             |                 | -20              | 8                   | 0               | -6             | 0               | -3            | 0               |                           |
|             |                 | -10              | 5                   | 0               | 7              | 0               | 6             | 0               |                           |
|             |                 | 0                | 6                   | 0               | -3             | 0               | -2            | 0               |                           |
|             |                 | +10              | 7                   | 0               | 8              | 0               | -4            | 0               |                           |
|             |                 | +20              | -5                  | 0               | -5             | 0               | -3            | 0               |                           |
|             |                 | +30              | -8                  | 0               | -1             | 0               | 5             | 0               |                           |
|             |                 | +40              | 7                   | 0               | -4             | 0               | 1             | 0               |                           |
|             |                 | +50              | -1                  | 0               | -5             | 0               | 1             | 0               |                           |
|             | 4.2             | +25              | -3                  | 0               | -7             | 0               | -5            | 0               | PASS                      |
|             | 3.6             | +25              | -8                  | 0               | -5             | 0               | 4             | 0               |                           |
| GPRS 850MHz | 3.7             | -30              | 4                   | 0               | 1              | 0               | 3             | 0               | PASS                      |
|             |                 | -20              | 2                   | 0               | -4             | 0               | -5            | 0               |                           |
|             |                 | -10              | 6                   | 0               | -7             | 0               | 2             | 0               |                           |
|             |                 | 0                | 5                   | 0               | -3             | 0               | 7             | 0               |                           |
|             |                 | +10              | -2                  | 0               | 4              | 0               | 5             | 0               |                           |
|             |                 | +20              | -2                  | 0               | -3             | 0               | -4            | 0               |                           |
|             |                 | +30              | -6                  | 0               | 6              | 0               | -5            | 0               |                           |
|             |                 | +40              | -5                  | 0               | -9             | 0               | -1            | 0               |                           |
|             |                 | +50              | 7                   | 0               | 3              | 0               | -2            | 0               |                           |
|             | 4.2             | +25              | 7                   | 0               | 5              | 0               | -6            | 0               | PASS                      |



| Band            | Test Conditions |                  | Frequency Deviation |                 |                |                 |               |                 | Verdict             |
|-----------------|-----------------|------------------|---------------------|-----------------|----------------|-----------------|---------------|-----------------|---------------------|
|                 | Power (VDC)     | Temperature (°C) | Low Channel         |                 | Middle Channel |                 | High Channel  |                 | Limit ±2.5ppm (ppm) |
|                 |                 |                  | Dev. Freq. Hz       | Deviation (ppm) | Dev. Freq. Hz  | Deviation (ppm) | Dev. Freq. Hz | Deviation (ppm) |                     |
| GPRS<br>1900MHz | 3.6             | +25              | 3                   | 0               | -3             | 0               | -3            | 0               | PASS                |
|                 | 3.7             | -30              | -4                  | 0               | -3             | 0               | -4            | 0               |                     |
|                 |                 | -20              | 2                   | 0               | -6             | 0               | 4             | 0               |                     |
|                 |                 | -10              | -2                  | 0               | -3             | 0               | 1             | 0               |                     |
|                 |                 | 0                | -6                  | 0               | 6              | 0               | 9             | 0               |                     |
|                 |                 | +10              | -7                  | 0               | 5              | 0               | 3             | 0               |                     |
|                 |                 | +20              | 8                   | 0               | -8             | 0               | 2             | 0               |                     |
|                 |                 | +30              | -2                  | 0               | 3              | 0               | 7             | 0               |                     |
|                 |                 | +40              | -8                  | 0               | 9              | 0               | 4             | 0               |                     |
|                 |                 | +50              | 4                   | 0               | 4              | 0               | -4            | 0               |                     |
|                 | 4.2             | +25              | 4                   | 0               | -1             | 0               | -3            | 0               |                     |
|                 | 3.6             | +25              | -6                  | 0               | -3             | 0               | 8             | 0               |                     |

### 3.5 Conducted Out of Band Emissions

#### 3.5.1 Requirement

According to FCC section 22.917(a) and FCC section 24.238(a), 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. This calculated to be -13dBm.

#### 3.5.2 Test Description

See section 3.1.2 of this report.

#### 3.5.3 Test Result

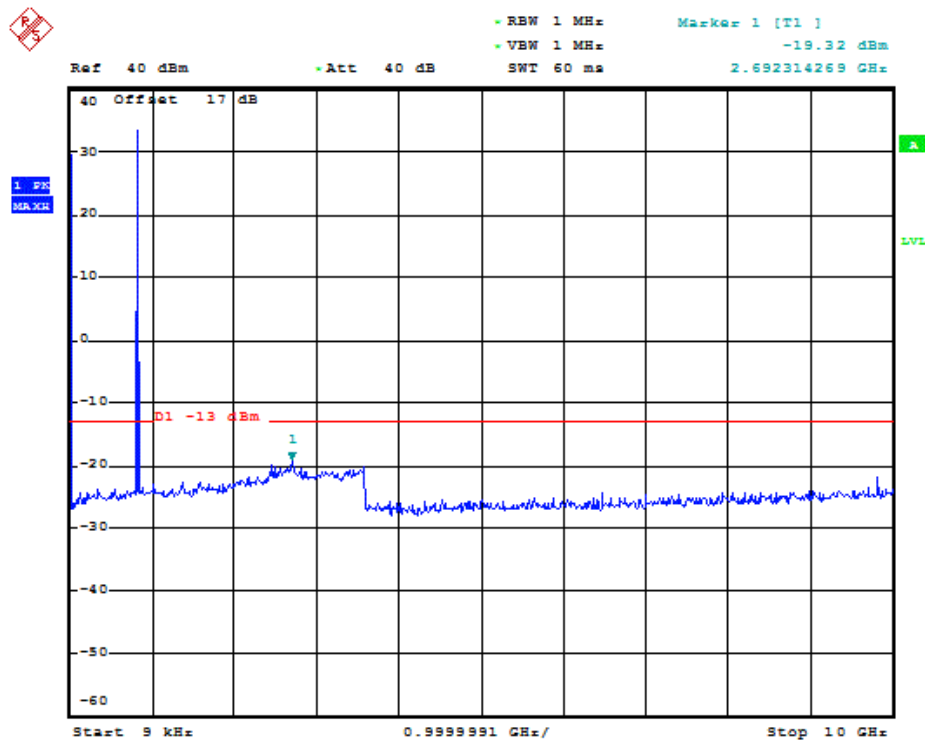
The measurement frequency range is from 30MHz to the 10<sup>th</sup> harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions. All modes are tested, including (GSM850 GPRS and PCS1900 GPRS ).

Test Verdict:

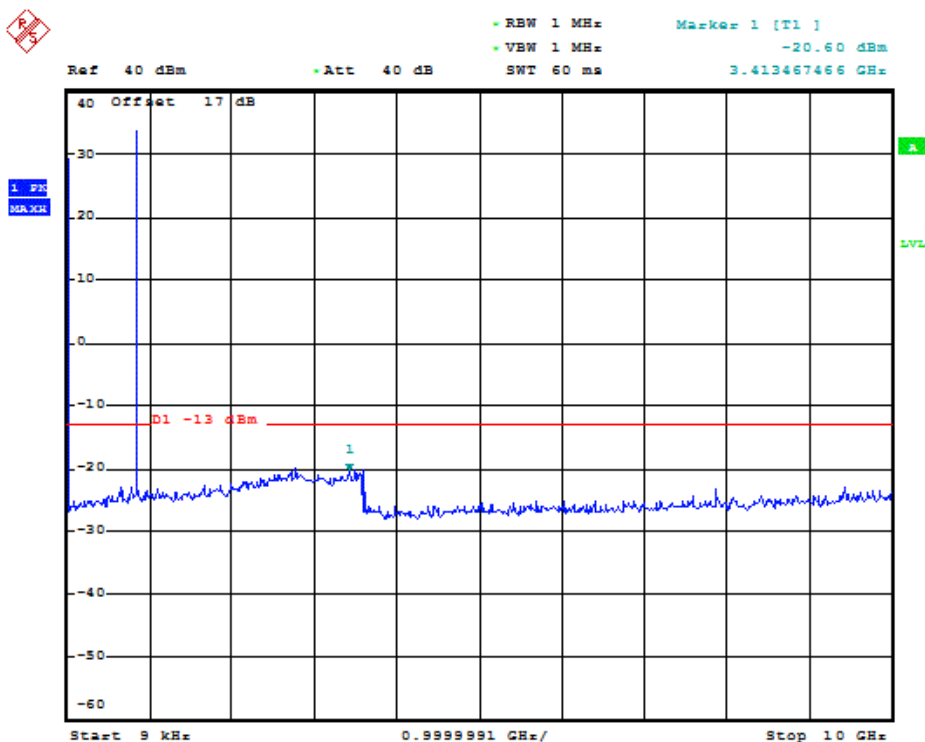
| Band         | Channel | Frequency (GHz) | Measured Max. Spurious Emission (dBm) | Refer to Plot | Limit (dBm) | Verdict |
|--------------|---------|-----------------|---------------------------------------|---------------|-------------|---------|
| GSM 850MHz   | 128     | 2.69            | -19.32                                | Plot A4       | -13         | PASS    |
|              | 190     | 3.41            | -20.60                                | Plot B4       |             | PASS    |
|              | 251     | 3.58            | -19.17                                | Plot C4       |             | PASS    |
| GSM 1900MHz  | 512     | 3.07            | -18.80                                | Plot D4       | -13         | PASS    |
|              | 661     | 3.58            | -18.51                                | Plot E4       |             | PASS    |
|              | 810     | 3.52            | -18.51                                | Plot F4       |             | PASS    |
| GPRS 850MHz  | 128     | 3.79            | -25.07                                | Plot G4       | -13         | PASS    |
|              | 190     | 3.58            | -20.46                                | Plot H4       |             | PASS    |
|              | 251     | 5.96            | -25.09                                | Plot I4       |             | PASS    |
| GPRS 1900MHz | 512     | 3.46            | -18.88                                | Plot J4       | -13         | PASS    |
|              | 661     | 3.23            | -19.03                                | Plot K4       |             | PASS    |
|              | 810     | 6.73            | -22.12                                | Plot L        |             | PASS    |

3. Test Plot for the Whole Measurement Frequency Range:

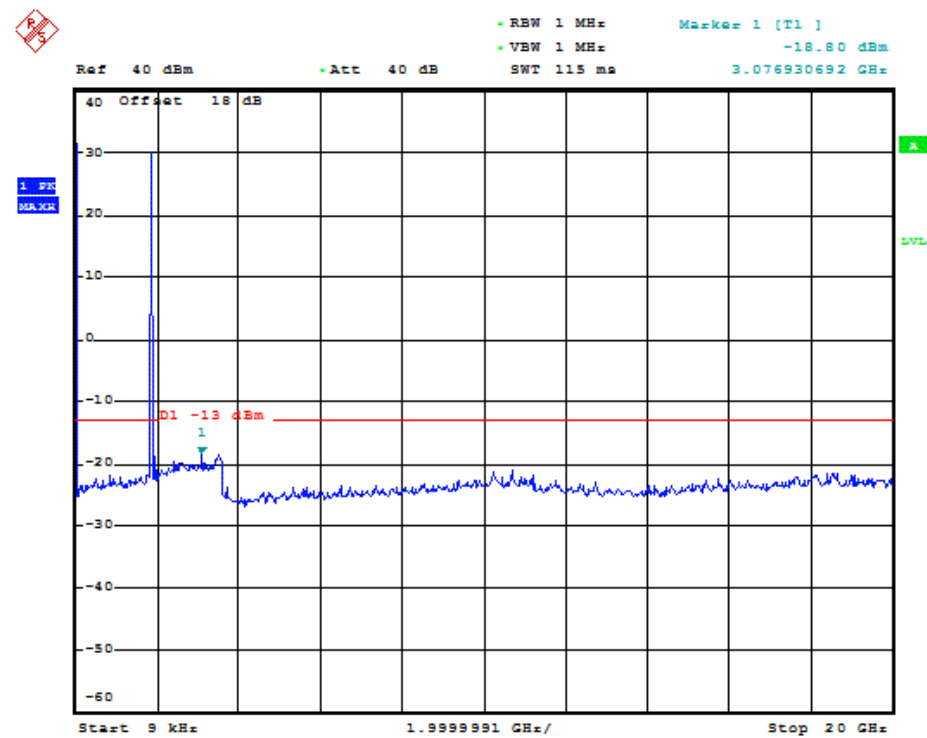
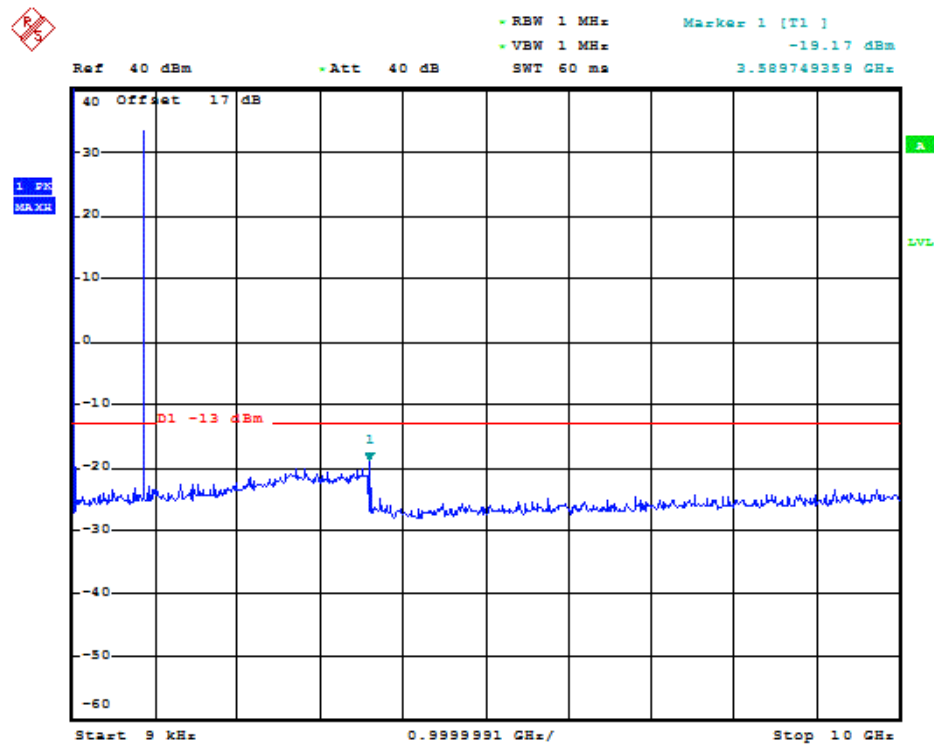
Note: the power of the EUT transmitting frequency should be ignored.



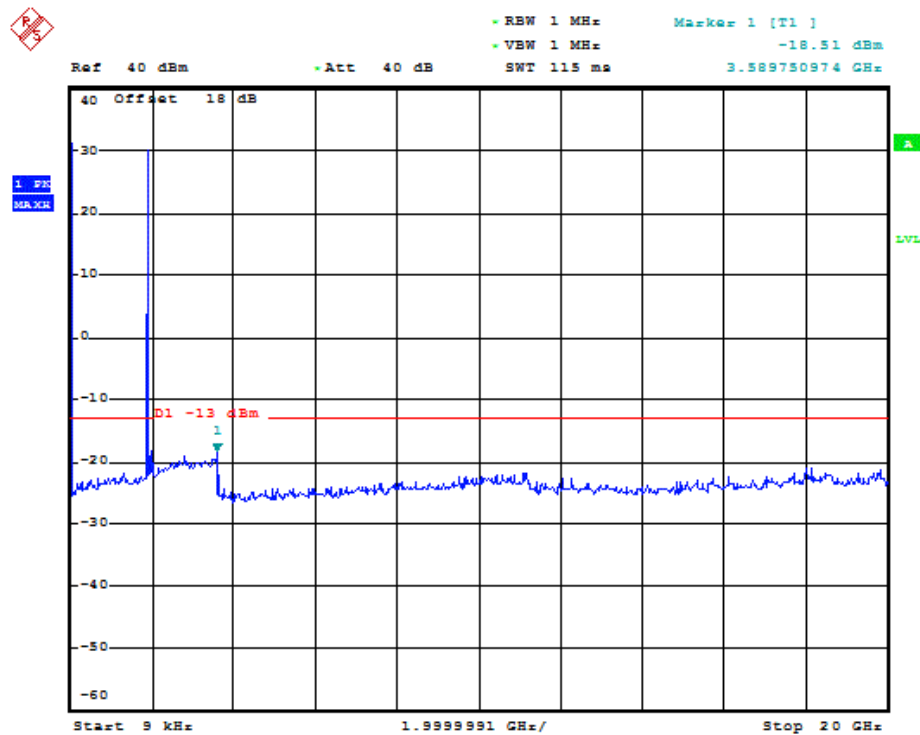
(Plot A4.:GSM 850MHz Channel = 128, 9KHz to 10GHz)



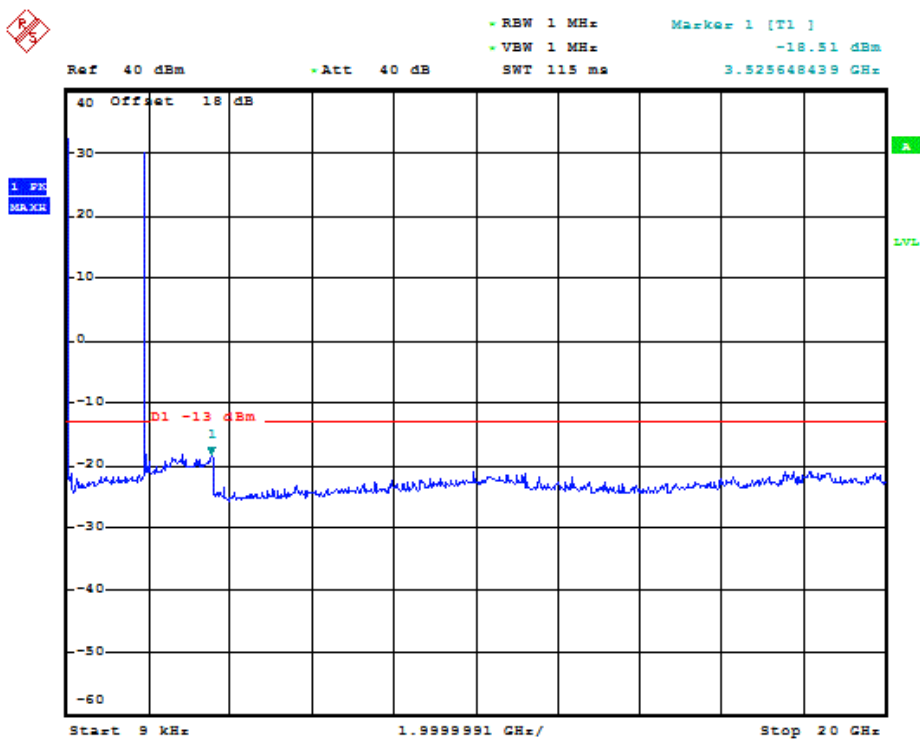
(Plot B4.:GSM 850MHz Channel = 190, 9KHz to 10GHz)



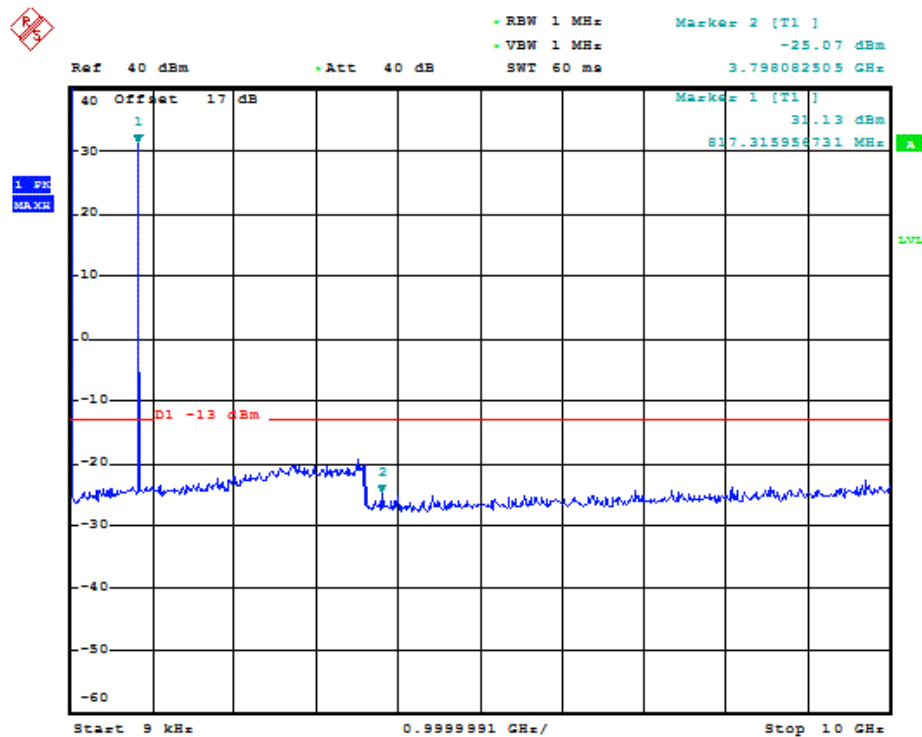




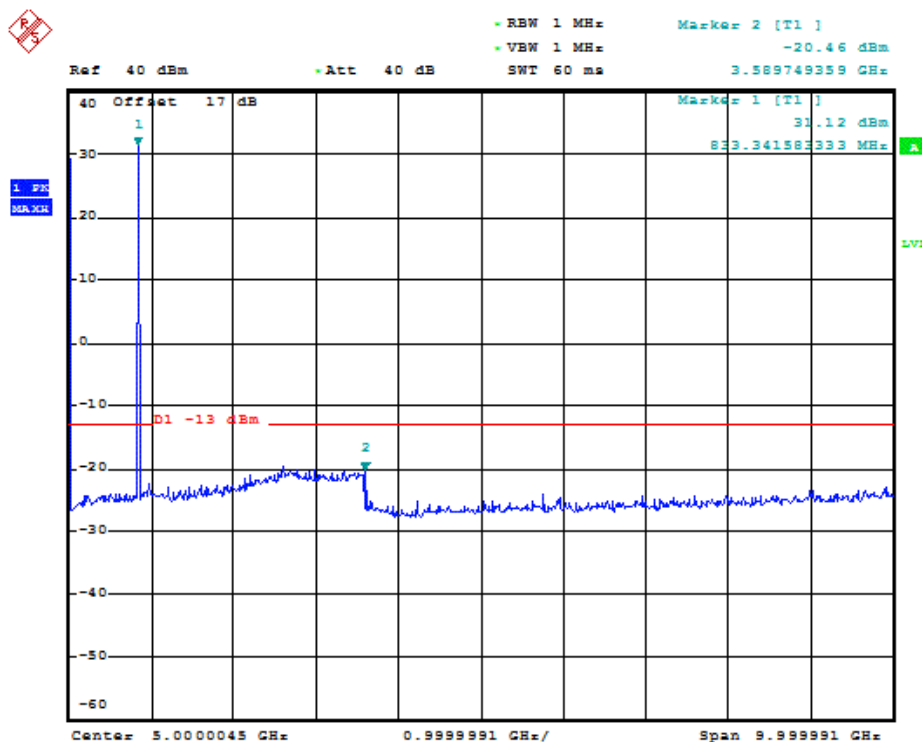
(Plot E4.: GSM 1900MHz Channel = 661, 9KHz to 20GHz)



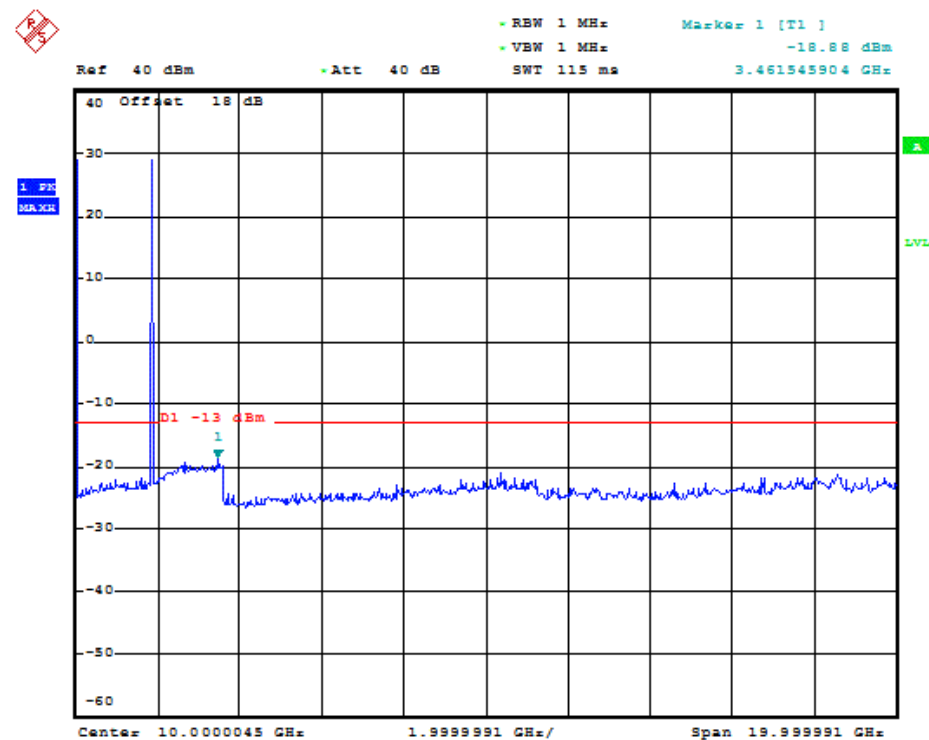
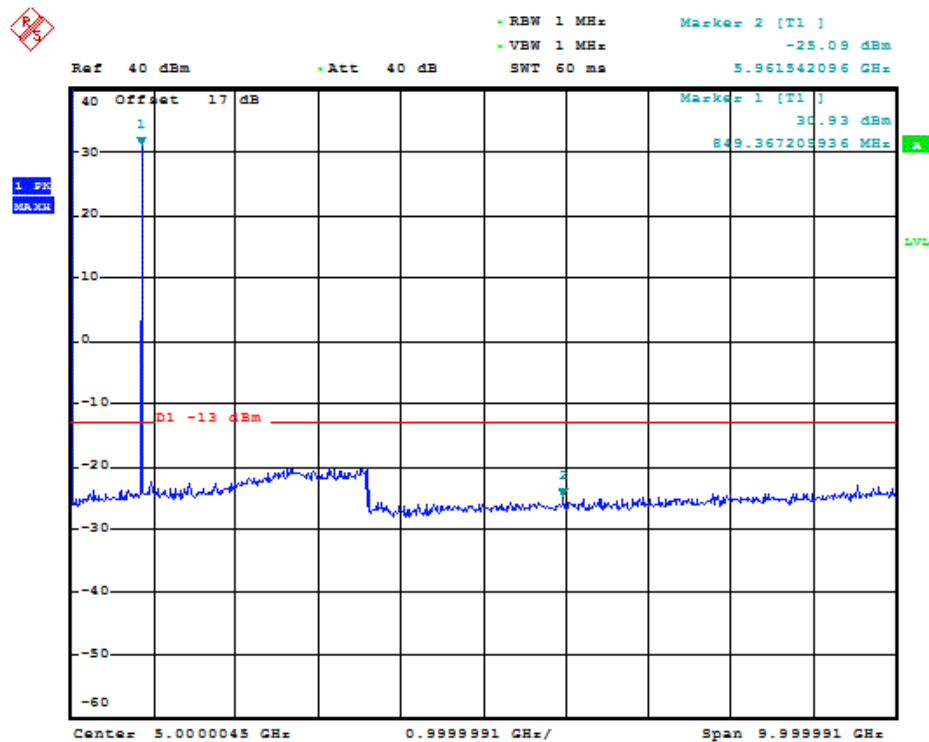
(Plot F4.: GSM 1900MHz Channel = 810, 9KHz to 20GHz)

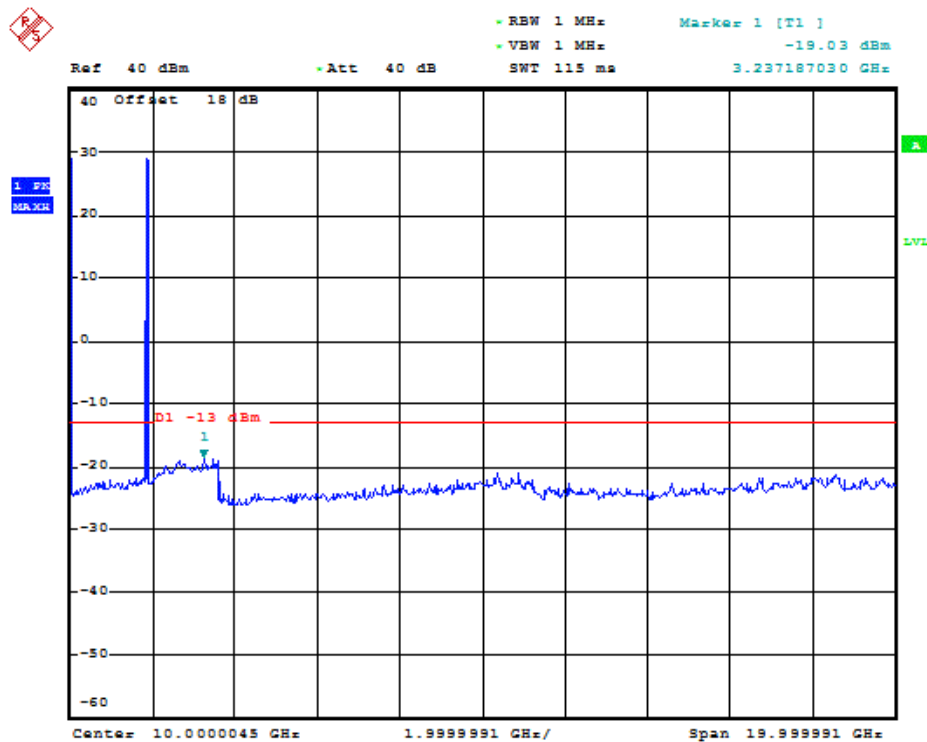


(Plot G4.:GPRS 850MHz Channel = 128, 9KHz to 10GHz)

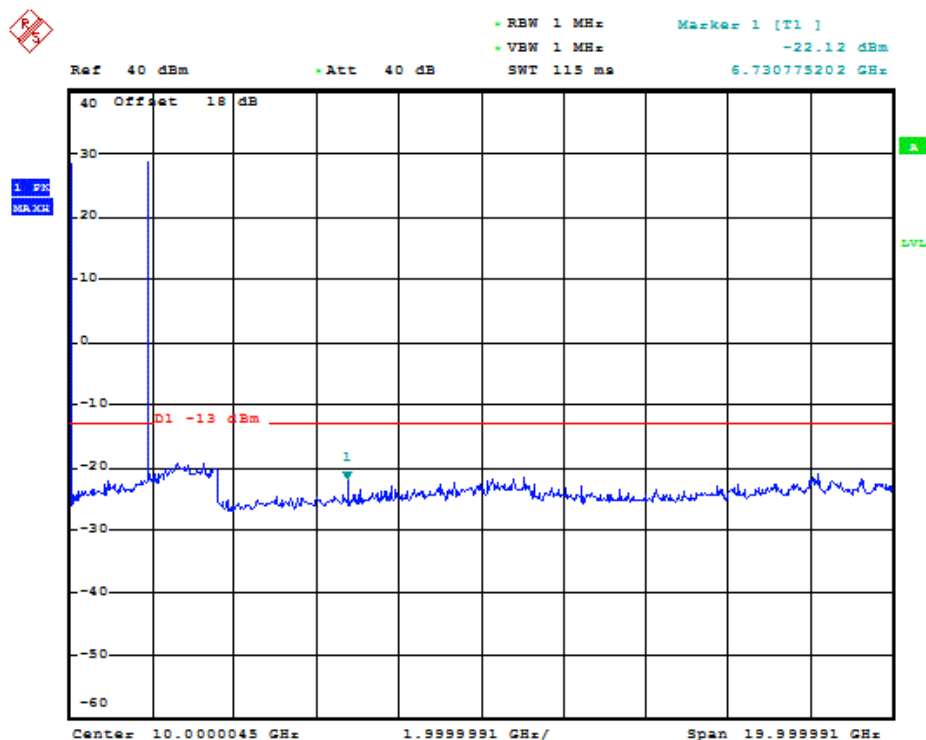


(Plot H4.: GPRS 850MHz Channel = 190, 9KHz to 10GHz)





(Plot K4.: GPRS 1900MHz Channel = 661, 9KHz to 20GHz)



(Plot L4.: GPRS 1900MHz Channel = 810, 9KHz to 20GHz)

### 3.6 Band Edge

#### 3.6.1 Requirement

According to FCC section 22.917(b) and FCC section 24.238(b), in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

#### 3.6.2 Test Description

See section 3.1.2 of this report.

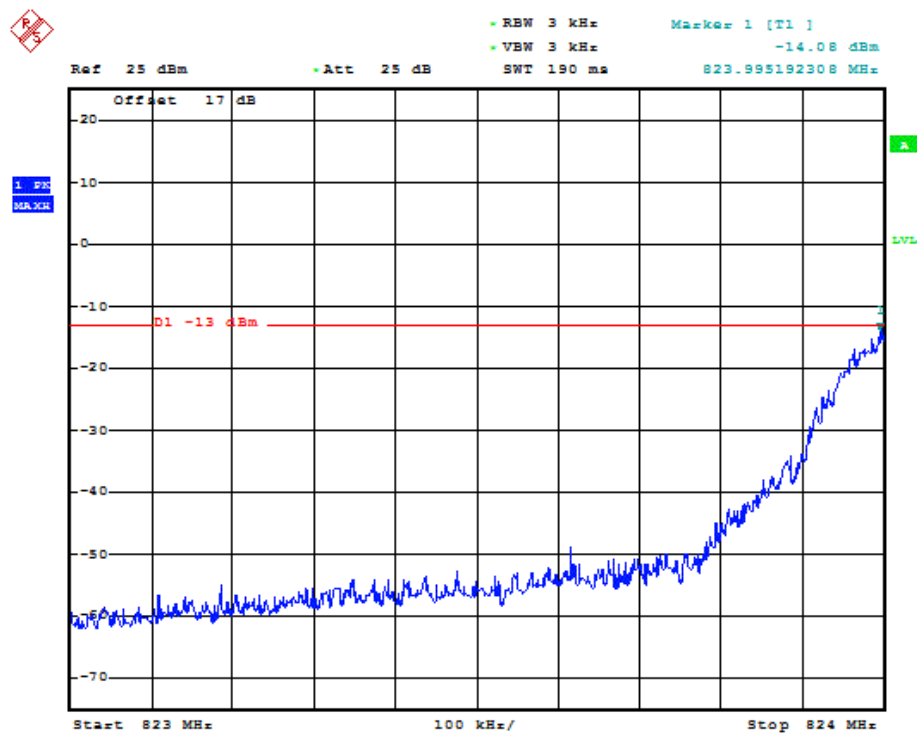
#### 3.6.3 Test Result

The lowest and highest channels are tested to verify the band edge emissions. All modes are tested, including (GSM850 GPRS EDGE and PCS1900 GPRS EDGE ).

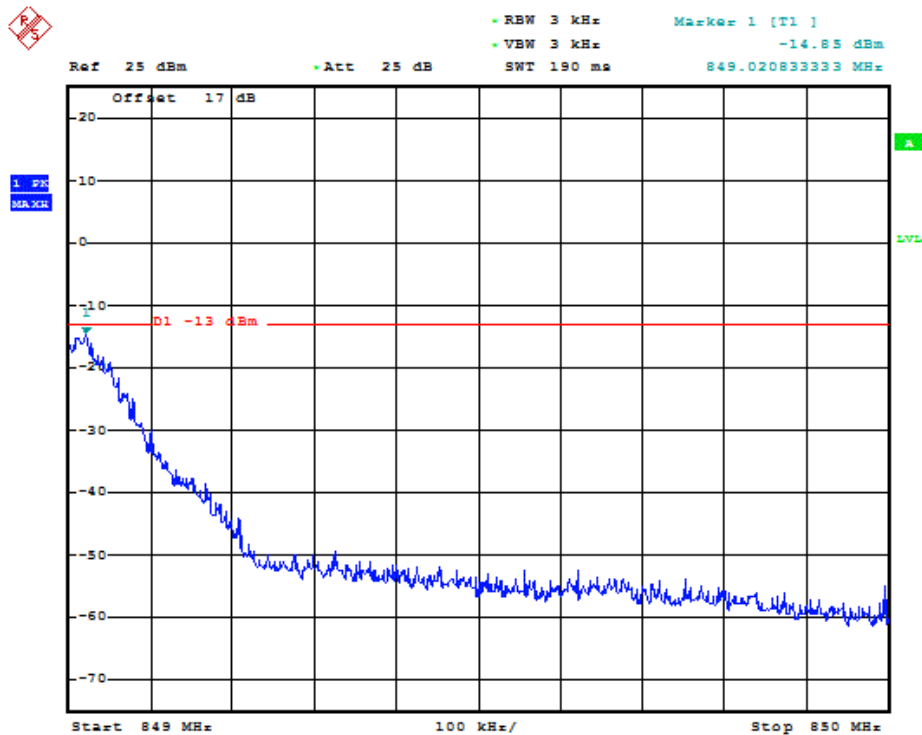
Test Verdict:

| Band         | Channel | Frequency (MHz) | Measured Max. Band Edge Emission (dBm) | Refer to Plot | Limit (dBm) | Verdict |
|--------------|---------|-----------------|----------------------------------------|---------------|-------------|---------|
| GSM 850MHz   | 128     | 823.99          | -14.08                                 | Plot A5       | -13         | PASS    |
|              | 251     | 849.02          | -14.85                                 | Plot B5       |             | PASS    |
| GSM 1900MHz  | 512     | 1850            | -14.35                                 | Plot C5       | -13         | PASS    |
|              | 810     | 1910            | -13.41                                 | Plot D5       |             | PASS    |
| GPRS 850MHz  | 128     | 823.99          | -15.17                                 | Plot E5       | -13         | PASS    |
|              | 251     | 849.00          | -15.42                                 | Plot F5       |             | PASS    |
| GPRS 1900MHz | 512     | 1849            | -15.13                                 | Plot G5       | -13         | PASS    |
|              | 810     | 1910            | -14.42                                 | Plot H5       |             | PASS    |

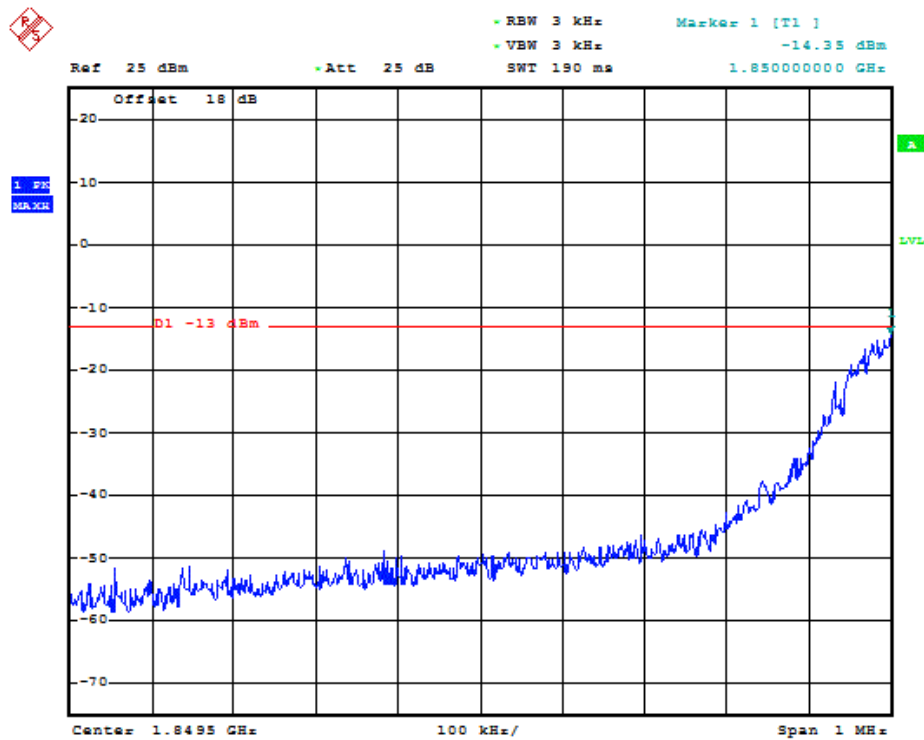
#### 4. Test Plot:



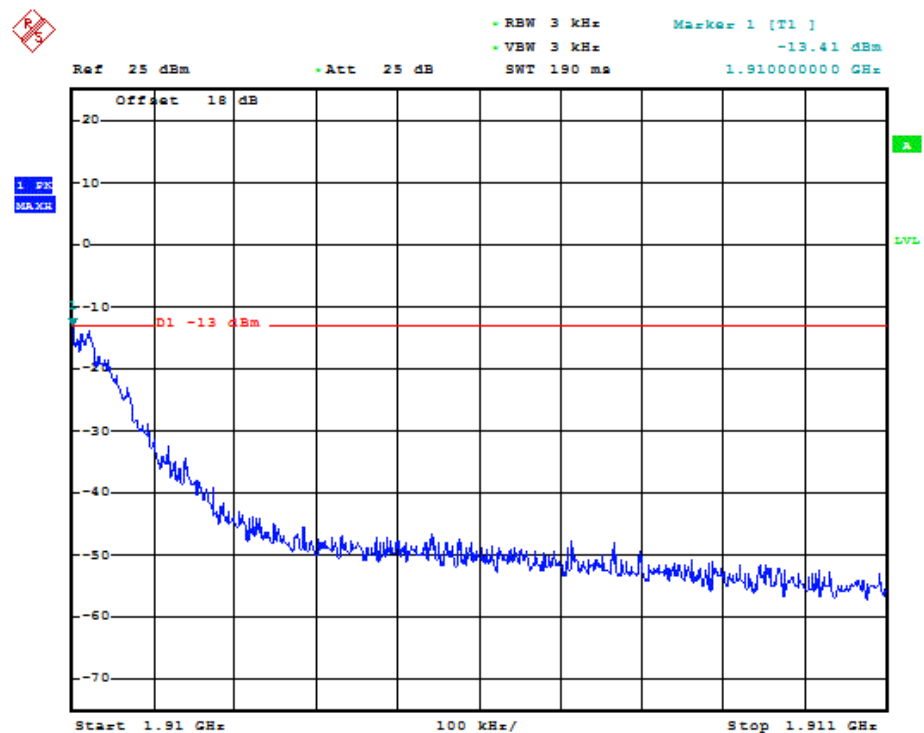
(Plot A5: GSM 850MHz Channel = 128)



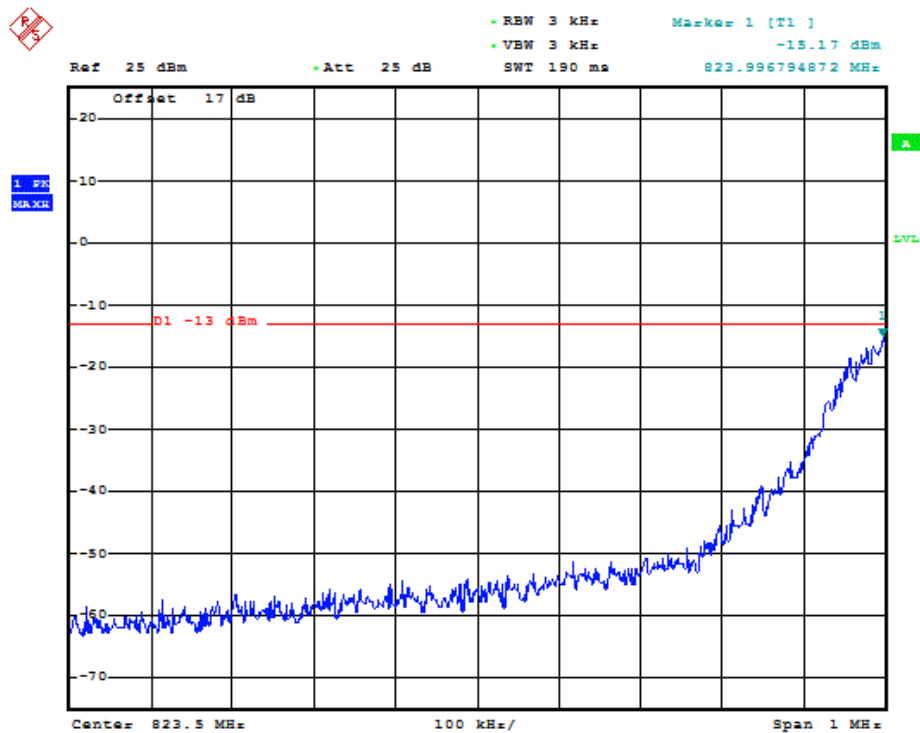
(Plot B5: GSM 850MHz Channel = 251)



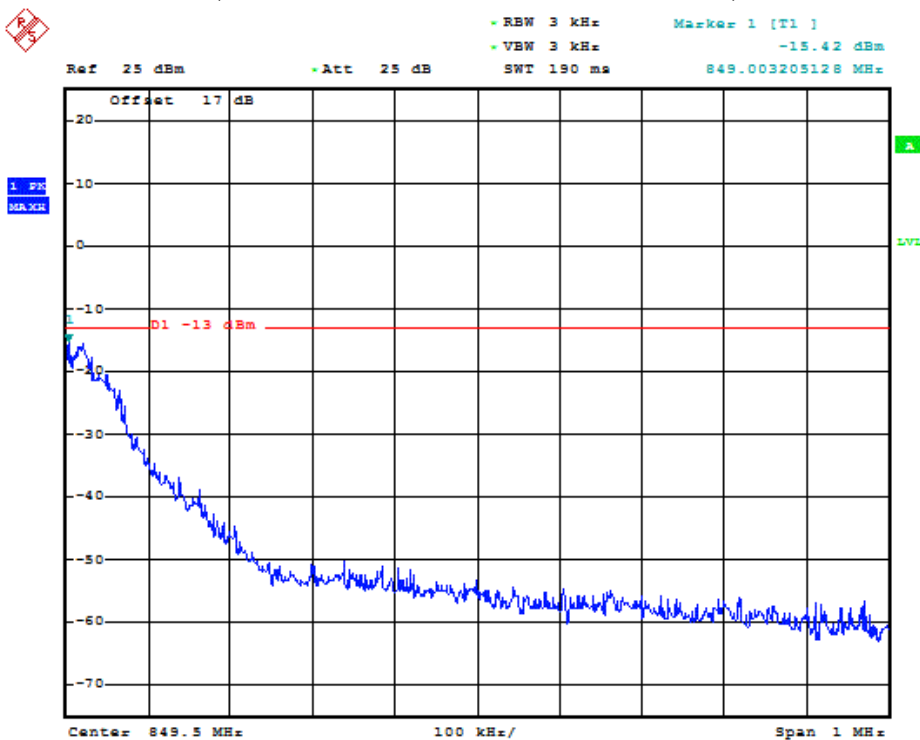
(Plot C5: GSM 1900MHz Channel = 512)



(Plot D5: GSM 1900MHz Channel = 810)

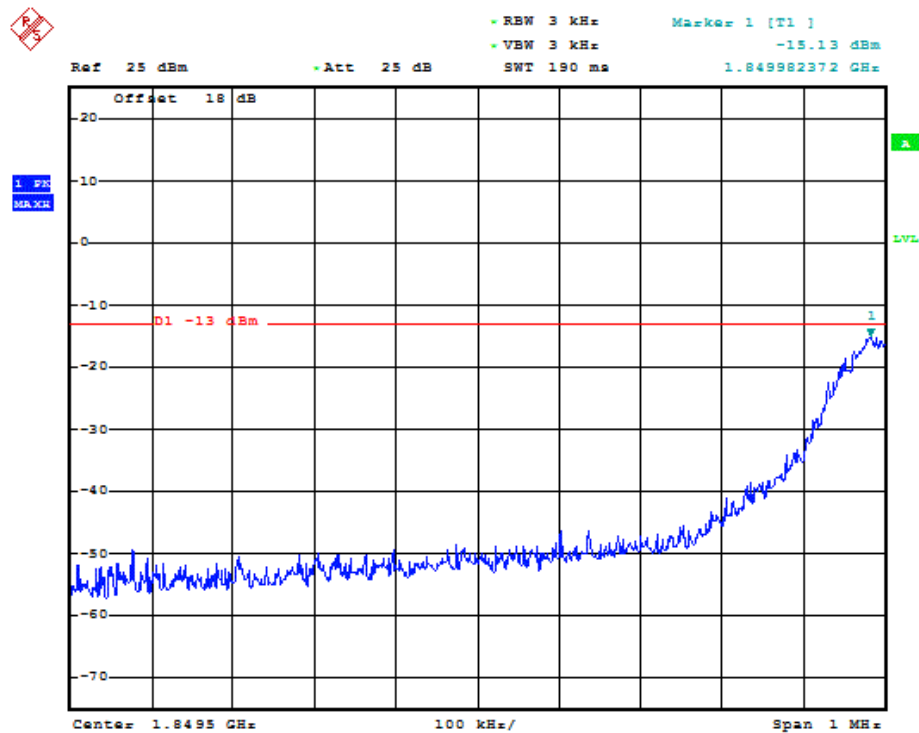


(Plot E5: GPRS 850MHz Channel = 128)

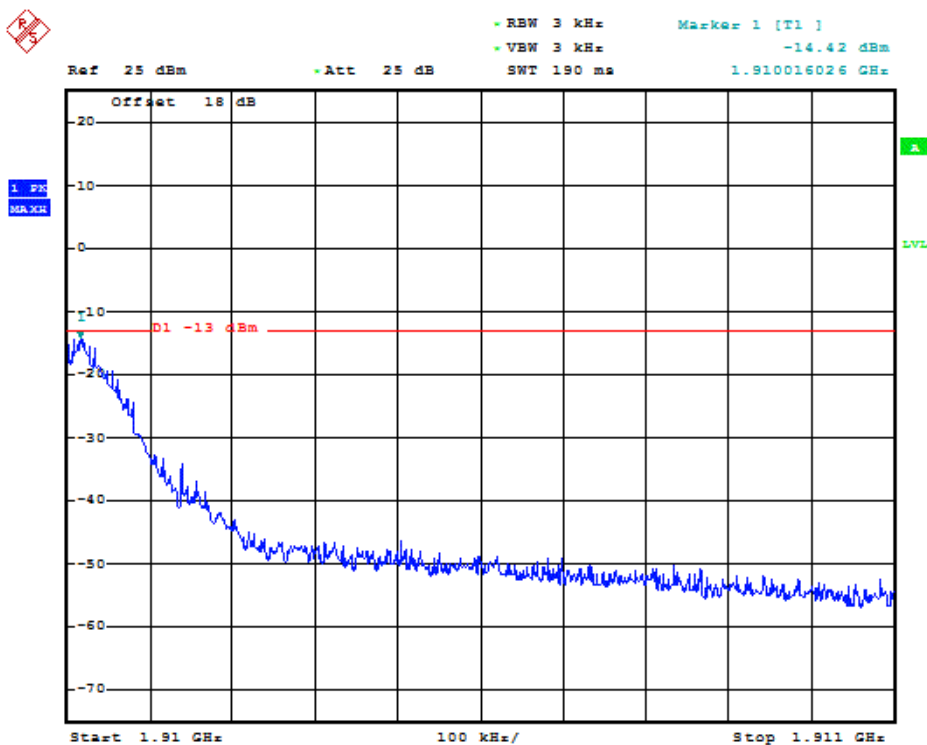


(Plot F5: GPRS 850MHz Channel = 251)





(Plot G5: GPRS 1900MHz Channel = 512)



(Plot H5: GPRS 1900MHz Channel = 810)

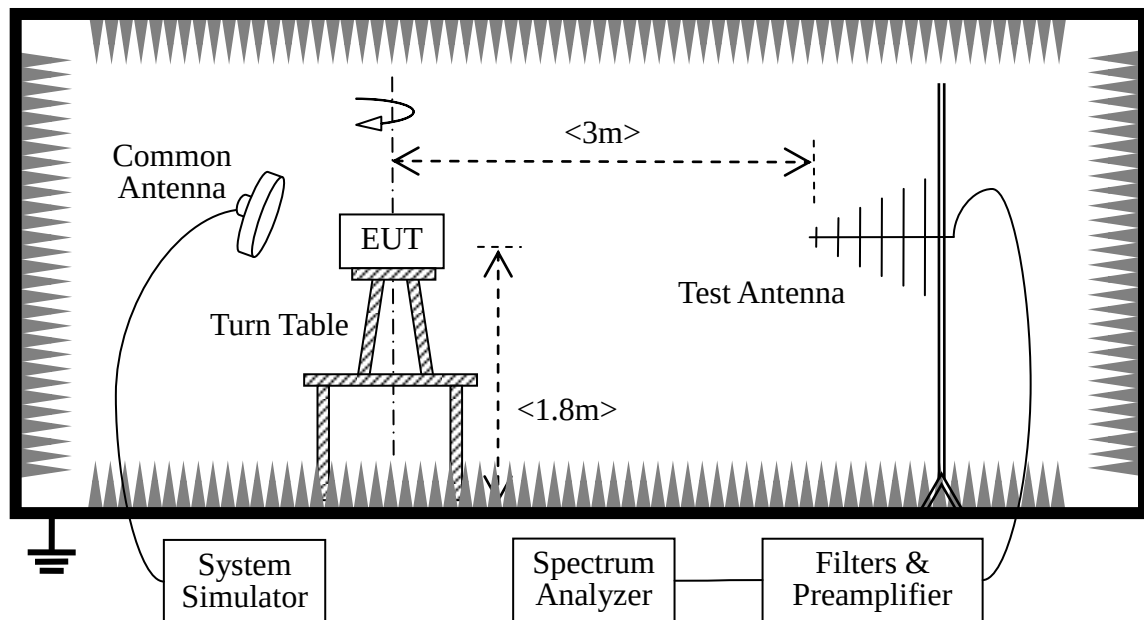
### 3.7 Transmitter Radiated Power (EIRP/ERP)

#### 3.7.1 Requirement

According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, the broadband PCS mobile station is limited to 2Watts e.i.r.p. peak power.

#### 3.7.2 Test Description

##### 1. Test Setup:



The EUT, which is powered by the Battery charged with the AC Adapter, is located in a 3m Full-Anechoic Chamber; the cable loss, air loss and so on of the site as factors are pre-calibrated using the "Substitution" method, and calculated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power i.e. GSM850MHz band Power Control Level (PCL) = 5 and Power Class = 4 and GSM1900MHz band Power Control Level (PCL) = 0 and Power Class = 1. A call is established between the EUT and the SS via a Common Antenna.

The Test Antenna is a Bi-Log one (used for 30MHz to 1GHz) or a Horn one (used for above 3GHz), and it's located at the same height as the EUT. The Filters consists of Notch Filters and High Pass Filter.

According to FCC §22.913, the ERP of Cellular mobile transmitters must not exceed 7 Watts (38.5dBm).

The measurements procedures in TIA-603C-2004 are used.

1. In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power ( $P_{in}$ ) is applied to the input of the dipole, and the power received ( $P_r$ ) at the chamber's probe antenna is recorded.
2. The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as  $A_{Rpl} = P_{in} - P_r$ . The  $A_{Rpl}$  is the attenuation of "reference path loss", and including the gain of receive antenna, the cable loss and the air loss.

The measurement results are obtained as described below:

$$\text{Power(EIRP)} = P_{Mea} + A_{Rpl}$$

3. The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.
4. From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.
5. The EUT is then put into continuously transmitting mode at its maximum power level.
6. Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step 1 is added to this result.
7. This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power ( $P_{in}$ )
8. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15\text{dBi}$ .
9. The test system should be checked before test by a standard comb signal source. The signal source put on the position, instead of the EUT. The test result should be compared with the test result before. If the test result is similar with the initial one, then the test system can work stably.

## 2. Equipments List:

| Description           | Manufacturer   | Model    | Serial No. | Cal. Date | Cal. Due |
|-----------------------|----------------|----------|------------|-----------|----------|
| SS                    | Agilent        | E5515C   | GB46040102 | 2009.10   | 1year    |
| Spectrum Analyzer     | Rohde& Schwarz | FSP13    | M-030176   | 2009.10   | 1year    |
| Full-Anechoic Chamber | Albatross      | 9m*6m*6m | (n.a.)     | 2009.10   | 2year    |
| Test Antenna - Bi-Log | Rohde&Schwarz  | HL562    | 100385     | 2009.10   | 1year    |
| Test Antenna - Horn   | Rohde&Schwarz  | HF906    | 100565     | 2009.10   | 1year    |

### 3.7.3 Test Result

The Turn Table is actuated to turn from 0 ° to 360 °, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. The lowest, middle and highest channels are tested. All modes are tested, including (GSM G850 and PCS1900).

Test Verdict:

| Band         | Channel | Measured ERP  |      |            |            |              |              | Limit |         | Verdict |
|--------------|---------|---------------|------|------------|------------|--------------|--------------|-------|---------|---------|
|              |         | dBm           | W    | Arpl (dBm) | Gain       | Pmea (dBm)   | Polarization | dBm   | W       |         |
| GSM 850 MHz  | 128     | 25.54         | 0.35 | 38.05      | 2.15       | -12.51       | Horizontal   | <38.5 | <7      | PASS    |
|              | 190     | 25.55         | 0.35 | 38.05      | 2.15       | -12.50       | Horizontal   |       |         | PASS    |
|              | 251     | 26.44         | 0.44 | 38.07      | 2.15       | -11.63       | Horizontal   |       |         | PASS    |
| Band         | Channel | Measured EIRP |      |            |            |              | Limit        |       | Verdict |         |
|              |         | dBm           | W    | Arpl (dBm) | Pmea (dBm) | Polarization | dBm          | W     |         |         |
| GSM 1900MHz  | 512     | 25.89         | 0.38 | 42.02      | -16.13     | Horizontal   | <33.0        | <2    | PASS    |         |
|              | 661     | 25.85         | 0.38 | 42.04      | -16.19     | Horizontal   |              |       | PASS    |         |
|              | 810     | 25.85         | 0.38 | 42.05      | -16.20     | Horizontal   |              |       | PASS    |         |
| Band         | Channel | Measured ERP  |      |            |            |              |              | Limit |         | Verdict |
|              |         | dBm           | W    | Arpl (dBm) | Gain       | Pmea (dBm)   | Polarization | dBm   | W       |         |
| GPRS 850MHz  | 128     | 24.97         | 0.31 | 38.05      | 2.15       | -13.08       | Horizontal   | <38.5 | <7      | PASS    |
|              | 190     | 24.91         | 0.30 | 38.05      | 2.15       | -13.14       | Horizontal   |       |         | PASS    |
|              | 251     | 24.71         | 0.29 | 38.07      | 2.15       | -13.36       | Horizontal   |       |         | PASS    |
| Band         | Channel | Measured EIRP |      |            |            |              | Limit        |       | Verdict |         |
|              |         | dBm           | W    | Arpl (dBm) | Pmea (dBm) | Polarization | dBm          | W     |         |         |
| GPRS 1900MHz | 512     | 24.41         | 0.27 | 42.02      | -17.61     | Horizontal   | <33.0        | <2    | PASS    |         |
|              | 661     | 24.43         | 0.27 | 42.04      | -17.61     | Horizontal   |              |       | PASS    |         |
|              | 810     | 24.38         | 0.27 | 42.05      | -17.61     | Horizontal   |              |       | PASS    |         |

### **3.8 Radiated Out of Band Emissions**

#### **3.8.1 Requirement**

According to FCC section 22.917(a) and section 24.238(a), 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. This calculated to be -13dBm.

#### **3.8.2 Test Description**

See section 3.7.2 of this report.

#### **3.8.3 Test Procedure**

1. Perform test system setup as section 2.4.2
2. Make a limit line whose value is -13dBm on the Spectrum Analyzer, and set the RBW of the Spectrum Analyzer to 1MHz.
3. The lowest and the highest channel were selected to perform tests respectively.
4. Employ the bi-log Test Antenna as the test system receiving antenna and set the frequency range of the Spectrum Analyzer from 30MHz to 3GHz.
5. The measurement is performed with the Test Antenna at both horizontal and vertical polarization respectively. Set the polarization of the Test Antenna to be horizontal.
6. Actuate the Turn Table to turn from 0 degrees to 360 degrees to find the maximum reading via the Spectrum Analyzer, mark the fundamental frequency and the harmonics thereof, after then record the harmonics and the plot.
7. Set the polarization of the Test Antenna to be vertical, then repeat step 6.
8. Employ the horn Test Antenna as the test system receiving antenna and set the frequency range of the Spectrum Analyzer from 3GHz to 10<sup>th</sup> harmonic of the fundamental frequency (here used 10GHz), then repeat step 5 to 7.
9. Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak and mark it; finally record the peak and the plot.
10. The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the ARpl is the attenuation of "reference path loss", and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below:  $\text{Power} = \text{PMea} + \text{ARpl}$

### 3.8.4 Test Result

#### Table for the Harmonics

NOTE: “---” in the table following means that the emission power was too small to be measured and was at least 12dB below the limit. All modes are tested, including (GSM850 GPRS and PCS1900 GPRS ).

#### I GSM 850MHz

| No.                              | Frequency (MHz) | Emission Power (dBm) |            |            |            |            |            | Limit (dBm) |
|----------------------------------|-----------------|----------------------|------------|------------|------------|------------|------------|-------------|
|                                  |                 | Vertical             | Arpl (dBm) | Pmea (dBm) | Horizontal | Arpl (dBm) | Pmea (dBm) |             |
| TCH number set to 190 (836.6MHz) |                 |                      |            |            |            |            |            |             |
| 10                               | 1673.25         | -56.61               | 6.08       | -62.69     | -55.91     | 6.07       | -61.98     | -13         |
| 11                               | 2481.14         | ---                  |            |            | ---        |            |            | -13         |
| 12                               | 2944.51         | ---                  |            |            | ---        |            |            | -13         |
| 13                               | 3915.14         | ---                  |            |            | ---        |            |            | -13         |
| 14                               | 4181.25         | -42.66               | 8.29       | -50.95     | -40.38     | 8.26       | -48.64     | -13         |
| 15                               | 5954.56         | ---                  |            |            | ---        |            |            | -13         |
| 16                               | 6691.87         | ---                  |            |            | -40.52     | 10.15      | -50.67     | -13         |
| 17                               | 7456.48         | ---                  |            |            | ---        |            |            | -13         |
| 18                               | 8054.48         | ---                  |            |            | ---        |            |            | -13         |

#### II GSM 1900MHz

| No.                               | Frequency (MHz) | Emission Power (dBm) |            |            |            |            |            | Limit (dBm) |
|-----------------------------------|-----------------|----------------------|------------|------------|------------|------------|------------|-------------|
|                                   |                 | Vertical             | Arpl (dBm) | Pmea (dBm) | Horizontal | Arpl (dBm) | Pmea (dBm) |             |
| TCH number set to 661 (1880.2MHz) |                 |                      |            |            |            |            |            |             |
| 10                                | 3738.75         | ---                  |            |            | ---        |            |            | -13         |
| 11                                | 5608.12         | ---                  |            |            | -43.80     | 9.31       | -53.11     | -13         |
| 12                                | 7479.37         | ---                  |            |            | ---        |            |            | -13         |
| 13                                | 9423.00         | ---                  |            |            | ---        |            |            | -13         |
| 14                                | 11286.00        | ---                  |            |            | ---        |            |            | -13         |
| 15                                | 13168.00        | ---                  |            |            | ---        |            |            | -13         |
| 16                                | 14426.2         | -33.98               | 10.42      | -44.4      | -33.05     | 10.41      | -43.46     | -13         |
| 17                                | 16926.00        | ---                  |            |            | ---        |            |            | -13         |
| 18                                | 18800.00        | ---                  |            |            | ---        |            |            | -13         |

#### III GPRS 850MHz

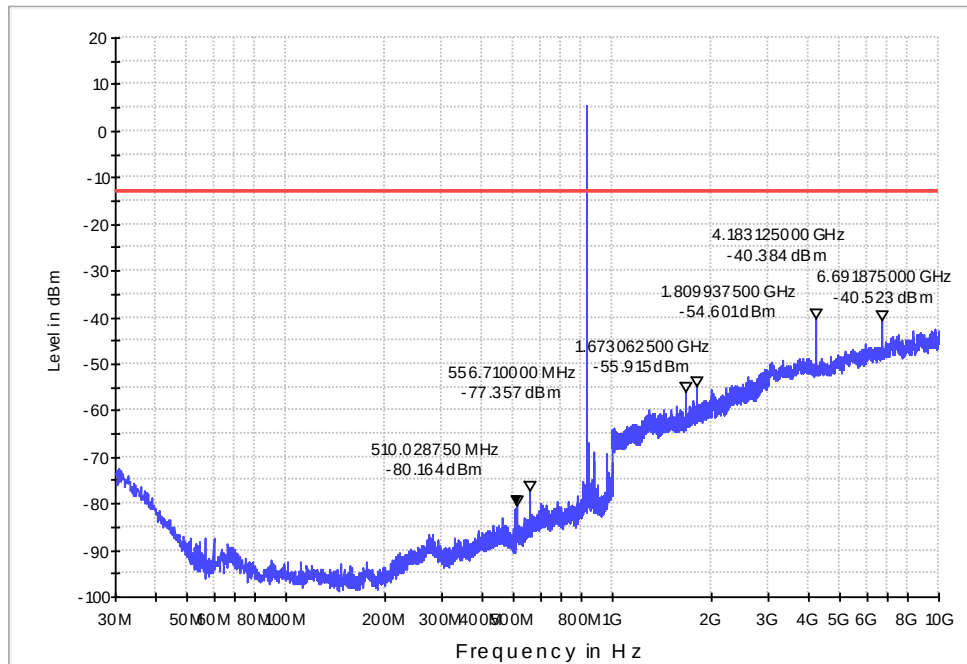
| No.                              | Frequency (MHz) | Emission Power (dBm) |            |            |            |            |            | Limit (dBm) |
|----------------------------------|-----------------|----------------------|------------|------------|------------|------------|------------|-------------|
|                                  |                 | Vertical             | Arpl (dBm) | Pmea (dBm) | Horizontal | Arpl (dBm) | Pmea (dBm) |             |
| TCH number set to 190 (836.6MHz) |                 |                      |            |            |            |            |            |             |
| 10                               | 1929.93         | -42.35               | 6.68       | -49.03     | -42.27     | 6.65       | -48.92     | -13         |
| 11                               | 2481.14         | ---                  |            |            | ---        |            |            | -13         |
| 12                               | 2944.51         | ---                  |            |            | ---        |            |            | -13         |
| 13                               | 3915.14         | ---                  |            |            | ---        |            |            | -13         |
| 14                               | 4183            | -42.52               | 8.26       | -50.78     | -48.42     | 8.25       | -56.67     | -13         |
| 15                               | 5954.56         | ---                  |            |            | ---        |            |            | -13         |
| 16                               | 6691.87         | ---                  |            |            | ---        |            |            | -13         |
| 17                               | 7456.48         | ---                  |            |            | ---        |            |            | -13         |
| 18                               | 8054.48         | ---                  |            |            | ---        |            |            | -13         |

#### IV GPRS 1900MHz

| No.                               | Frequency (MHz) | Emission Power (dBm) |            |            |            |            |            | Limit (dBm) |
|-----------------------------------|-----------------|----------------------|------------|------------|------------|------------|------------|-------------|
|                                   |                 | Vertical             | Arpl (dBm) | Pmea (dBm) | Horizontal | Arpl (dBm) | Pmea (dBm) |             |
| TCH number set to 661 (1880.2MHz) |                 |                      |            |            |            |            |            |             |
| 10                                | 3759.37         | -36.51               | 7.91       | -44.42     | -43.19     | 7.90       | -51.09     | -13         |
| 11                                | 5640            | -38.83               | 9.36       | -48.19     | -40.23     | 9.35       | -49.58     | -13         |
| 12                                | 7479.37         | ---                  |            |            | ---        |            |            | -13         |
| 13                                | 9423.00         | ---                  |            |            | ---        |            |            | -13         |
| 14                                | 11280           | ---                  |            |            | -40.71     | 11.72      | -52.43     | -13         |
| 15                                | 13168.00        | ---                  |            |            | ---        |            |            | -13         |
| 16                                | 14426.2         |                      |            |            |            |            |            | -13         |
| 17                                | 16926.00        | ---                  |            |            | ---        |            |            | -13         |
| 18                                | 18800.00        | ---                  |            |            | ---        |            |            | -13         |

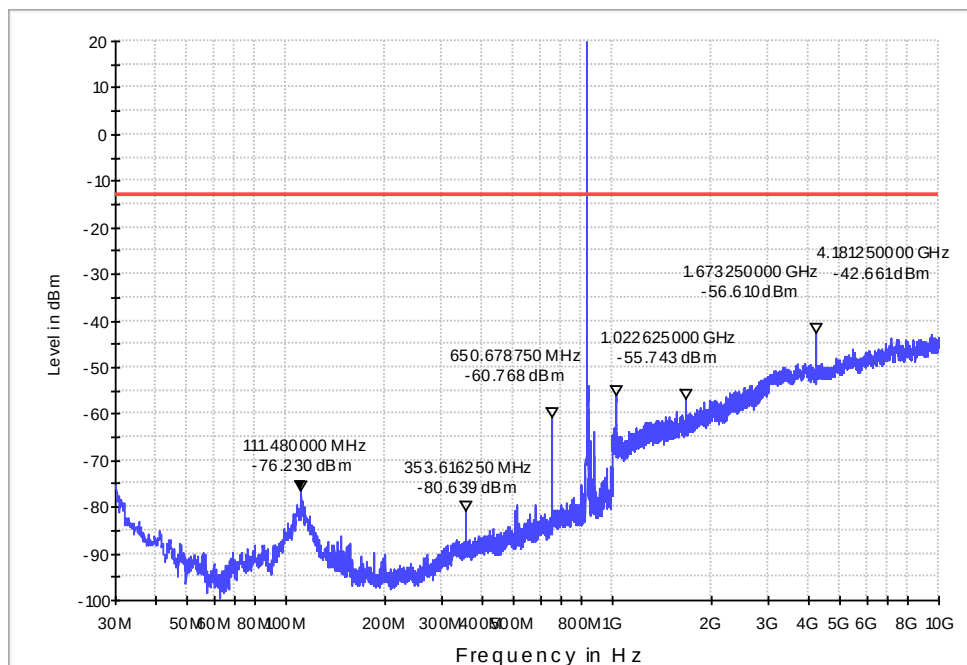
Test Plot

MORLAB-RSE-FCC-GSM850 30M-18G



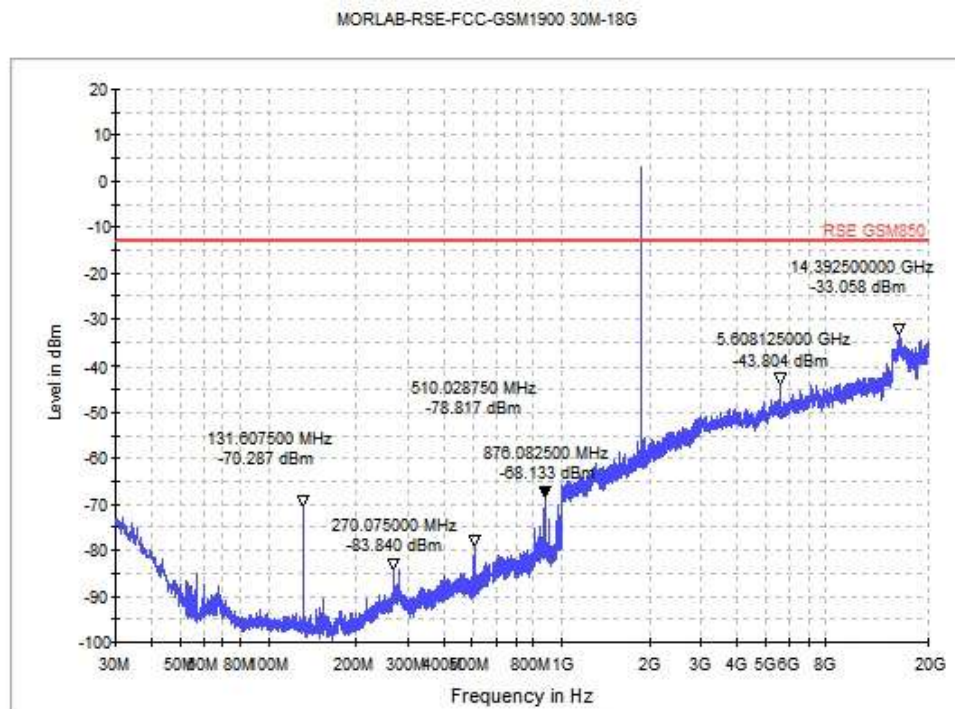
### GSM850 CH190-H

MORLAB-RSE-FCC-GSM850 30M-18G

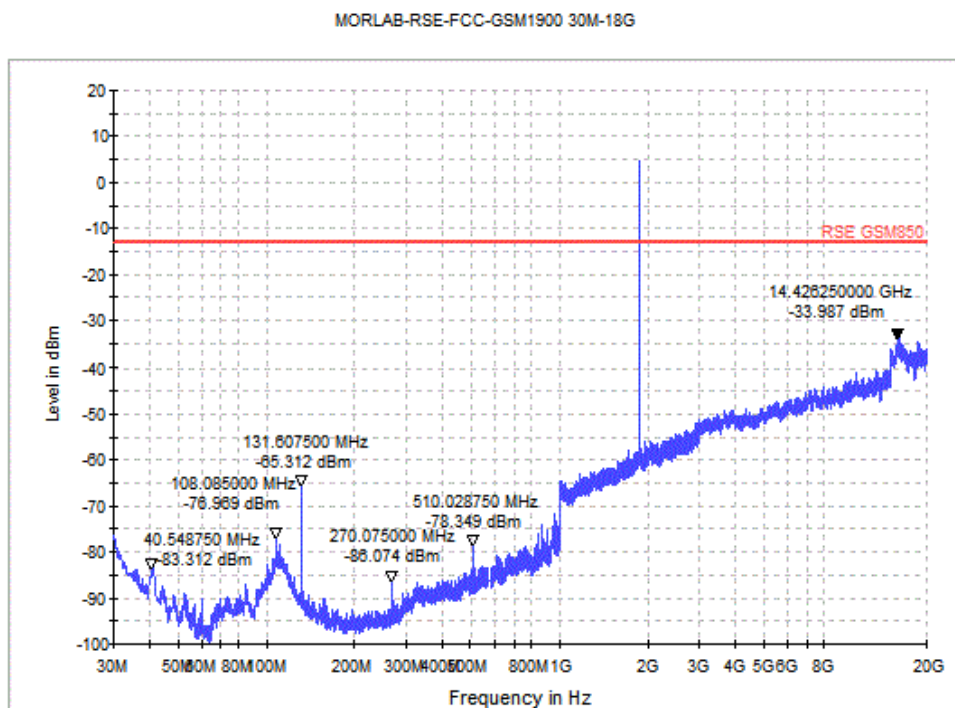


### GSM850 CH190-V



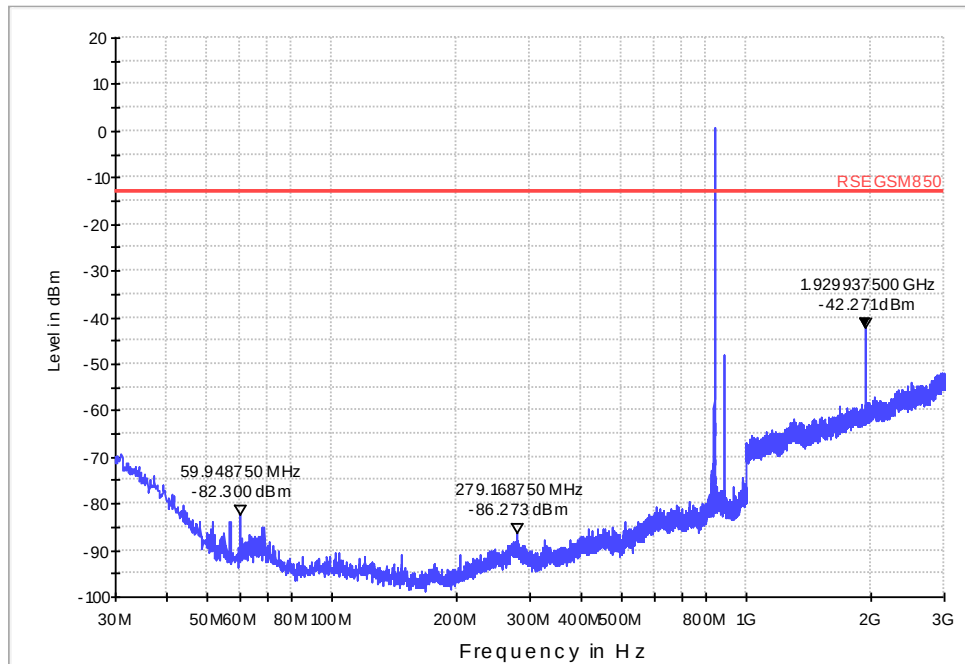


GSM1900 CH661-H



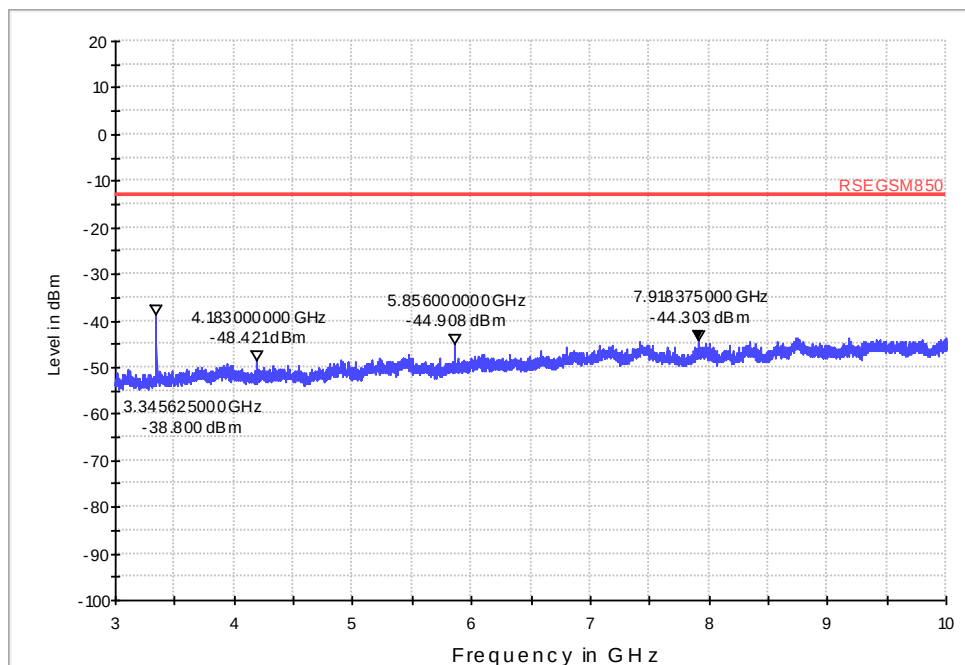
GSM1900 CH661-V

MORLAB-RSE-FCC-GSM850 30M-3G



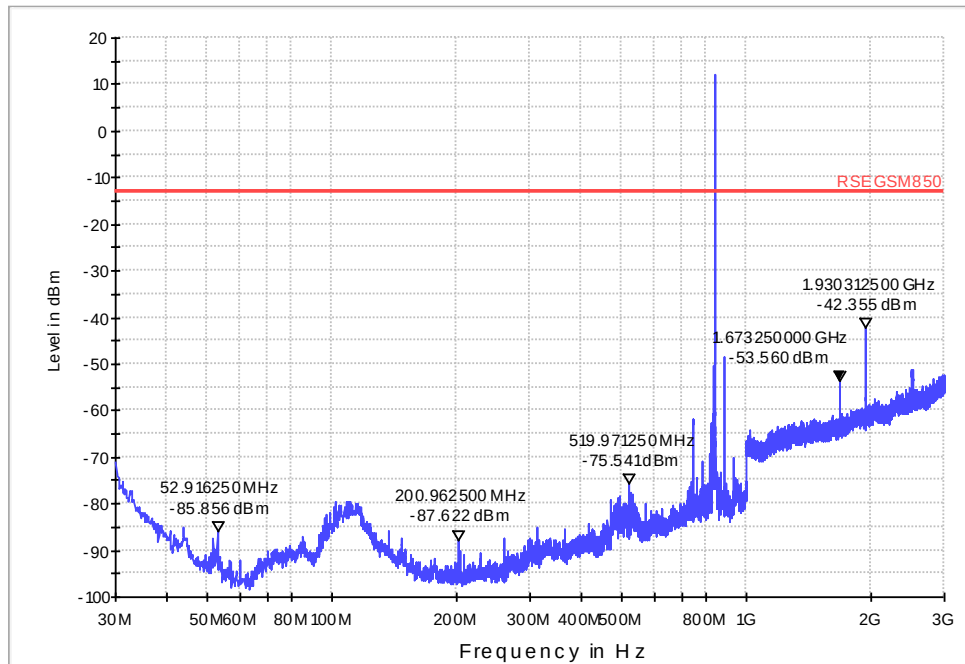
GPRS850 CH190-H 30M-3G

MORLAB-RSE-FCC-GSM850 3G-10G



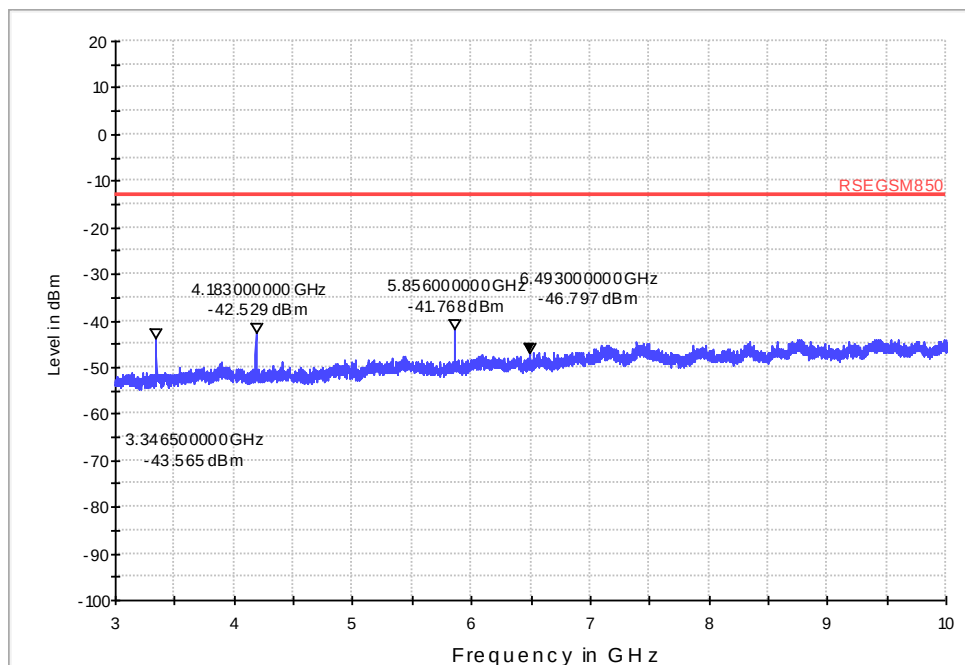
GPRS850 CH190-H 3G-10G

MORLAB-RSE-FCC-GSM850 30M-3G



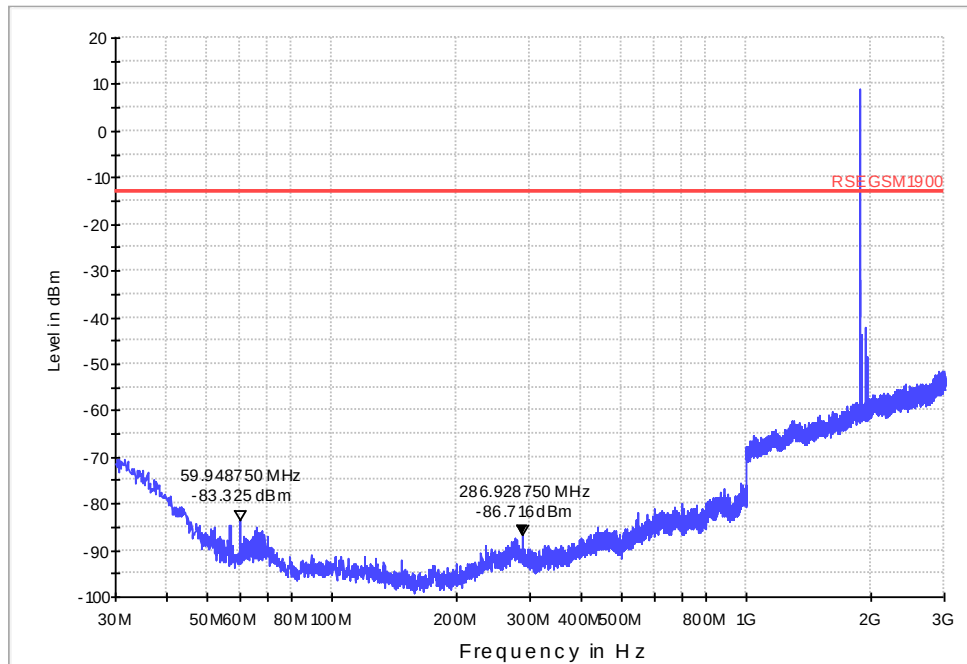
GPRS850 CH190-V 30M-3G

MORLAB-RSE-FCC-GSM850 3G-10G



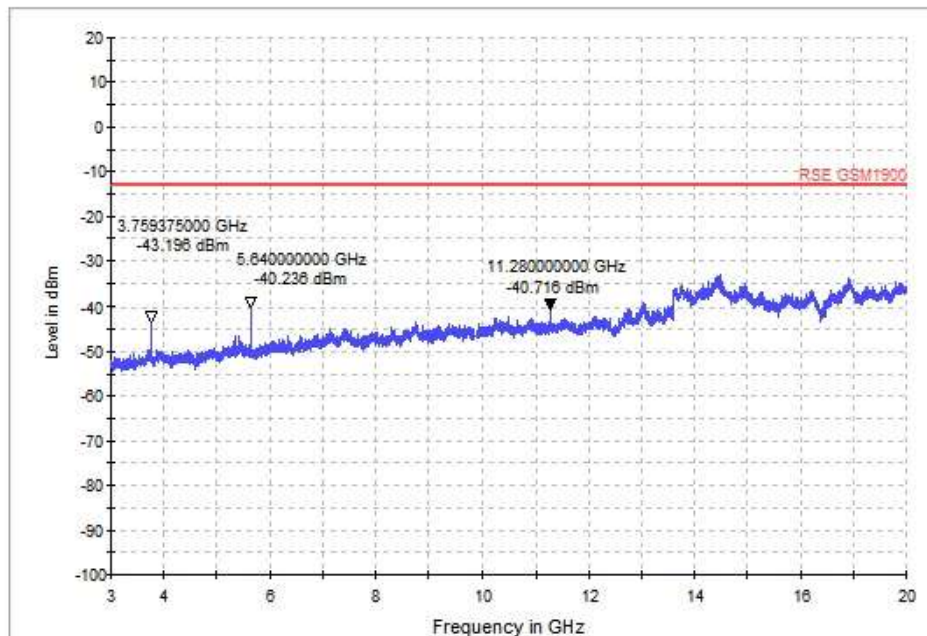
GPRS850 CH190-V 3G-10G

MORLAB-RSE-FCC-GSM1900 30M-3G



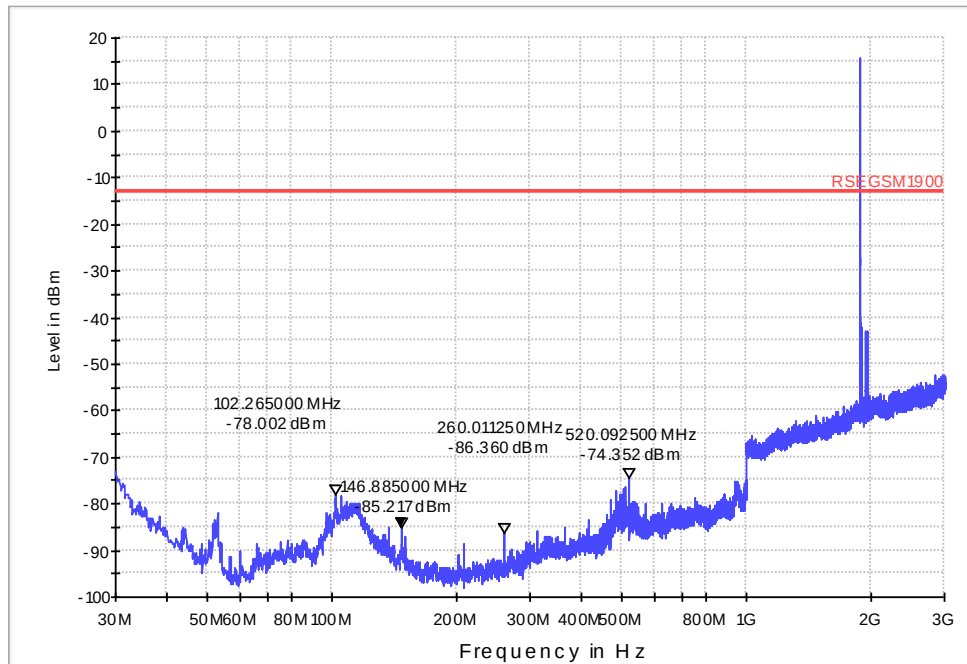
GPRS1900 CH661-H 30M-3G

MORLAB-RSE-FCC-GSM1900 3G-20G



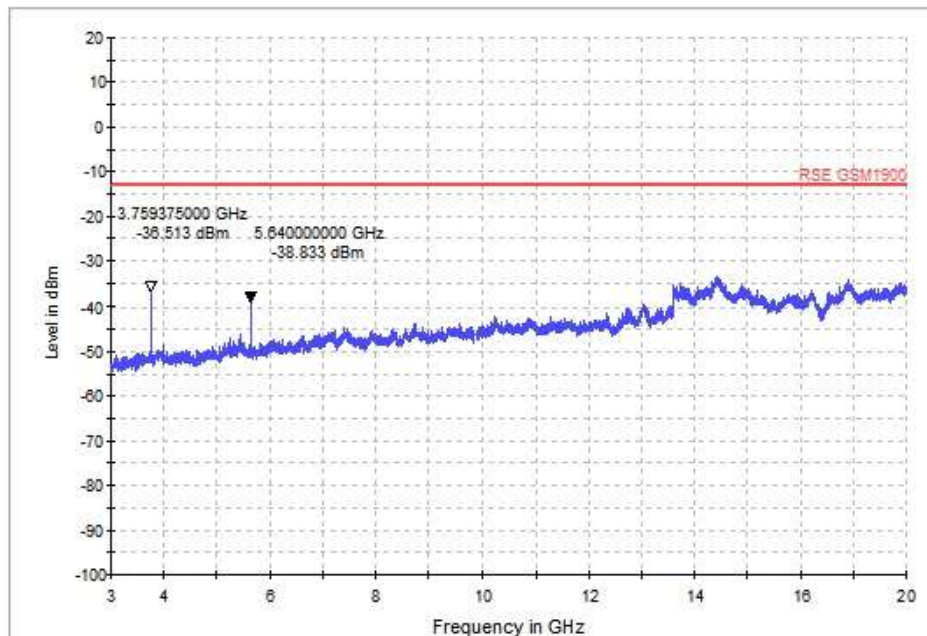
GPRS1900 CH661-H 3G-20G

MORLAB-RSE-FCC-GSM1900 30M-3G



GPRS1900 CH661-V 30M-3G

MORLAB-RSE-FCC-GSM1900 3G-20G



GPRS1900 CH661-V 3G-20G

\*\* END OF REPORT \*\*