

## TEST REPORT

**Report Number:** 101483717LEX-001  
**Project Number:** G101483717

**Report Issue Date:** 1/10/2014

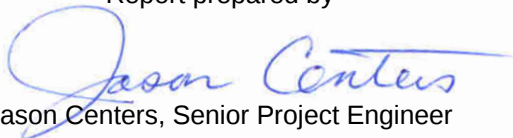
**Product Name:** TCA203  
**Model Number:** TCA203  
**FCCID:** G95TCA203  
**ICID:** 431C-TCA203  
**FCC Standards:** FCC Part 22 Subpart H  
FCC Part 24 Subpart E

**Industry Canada Standards:** RSS-132 Issue 3  
RSS-133 Issue 6

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## 1 Introduction and Conclusion

The tests indicated in Section 2 were performed on the product constructed as described in Section 3. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test method, a list of the actual test equipment used, documentation photos, results and raw data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested complied with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

The INTERTEK-Lexington laboratory is located at 731 Enterprise Drive, Lexington Kentucky, 40510. The radiated emission test site is a 10-meter semi-anechoic chamber. The chamber meets the characteristics of CISPR 16-1 and ANSI C63.4. For measurements, a remotely controlled flush-mount metal-top turntable is used to rotate the EUT a full 360 degrees. A remote controlled non-conductive antenna mast is used to scan the antenna height from one to four meters. The test site is listed with the FCC under Registration Number 485103.

## 2 Test Summary

| Page | Test full name                               | FCC Reference                                             | Industry Canada                                   | Result |
|------|----------------------------------------------|-----------------------------------------------------------|---------------------------------------------------|--------|
| 7    | Conducted Output Power                       | §2.1046<br>§24.232(d)                                     | RSS-132 (4.4),<br>RSS-133 (4.1),<br>RSS-133 (6.4) | Pass   |
| 15   | Occupied Bandwidth                           | §2.1049,<br>§22.917(b)(d), and<br>§24.238(a)              | RSS-GEN (4.6.1),<br>RSS-133 (2.3)                 | Pass   |
| 19   | Conducted Spurious Emissions                 | §2.1049, §2.1051,<br>§22.917(a)(b), and<br>§ 24.238(a)(b) | RSS-132 (4.5),<br>RSS-133 (6.5.1)                 | Pass   |
| 45   | Radiated Output Power                        | § 22.913(a) and<br>§ 24.232(c)                            | RSS-132 (4.4),<br>RSS-133 (6.4)                   | Pass   |
| 52   | Radiated Spurious Emissions<br>(Transmitter) | §2.1053, §22.917(a)(b),<br>and §24.238(a)(b)              | RSS-132 (4.5),<br>RSS-133 (6.5)                   | Pass   |
| 60   | Frequency Stability                          | §2.1055, §22.355, and<br>§24.235                          | RSS-132 (4.3),<br>RSS-133 (6.3)                   | Pass   |

**3 Description of Equipment Under Test**

| <b>Equipment Under Test</b>             |                                                                                                                                                                                             |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Manufacturer</b>                     | Technicolor USA, Inc.                                                                                                                                                                       |
| <b>Model Number</b>                     | TCA203                                                                                                                                                                                      |
| <b>Serial Number</b>                    | 3440151188835                                                                                                                                                                               |
| <b>FCC Identifier</b>                   | G95TCA203                                                                                                                                                                                   |
| <b>IC Identifier</b>                    | 431C-TCA203                                                                                                                                                                                 |
| <b>Receive Date</b>                     | 12/18/2013                                                                                                                                                                                  |
| <b>Test Start Date</b>                  | 12/18/2013                                                                                                                                                                                  |
| <b>Test End Date</b>                    | 1/10/2014                                                                                                                                                                                   |
| <b>Device Received Condition</b>        | Good                                                                                                                                                                                        |
| <b>Test Sample Type</b>                 | Production                                                                                                                                                                                  |
| <b>Frequency Band</b>                   | 824MHz - 849MHz (GSM 850 Band)<br>1850MHz – 1910MHz (GSM 1900 Band)                                                                                                                         |
| <b>Modulation Type</b>                  | GSM (GMSK), GPRS (GMSK), EDGE (8-PSK)                                                                                                                                                       |
| <b>Transmission Control</b>             | Base Station Simulator                                                                                                                                                                      |
| <b>Maximum Output Power (Conducted)</b> | 32.19 dBm (GSM 850 - GMSK)<br>28.72 dBm (GSM 1900 - GMSK)<br>26.47dBm (GSM 850 – EDGE / 8PSK)<br>25.32 dBm (GSM 1900 – EDGE / 8PSK)<br>22.1 dBm (WCDMA Band V)<br>21.98 dBm (WCDMA Band II) |
| <b>Test Channels</b>                    | 128, 190, & 251 (GSM 850 Band)<br>512, 661, & 810 (GSM 1900 Band)<br>4132, 4182, 4233 (WCDMA Band V)<br>9262, 9400, 9538 (WCDMA Band II)                                                    |
| <b>Antenna Type</b>                     | Internal                                                                                                                                                                                    |
| <b>Operating Voltage</b>                | 115VAC/60Hz (Via AC / DC Power Adapter)                                                                                                                                                     |

**Description of Equipment Under Test**

The TCA203 is a touch screen alarm panel that contains a zigbee, 802.11b/g/n, and cellular modules. This report contains data pertaining to the cellular transmissions.

**Operating modes of the EUT:**

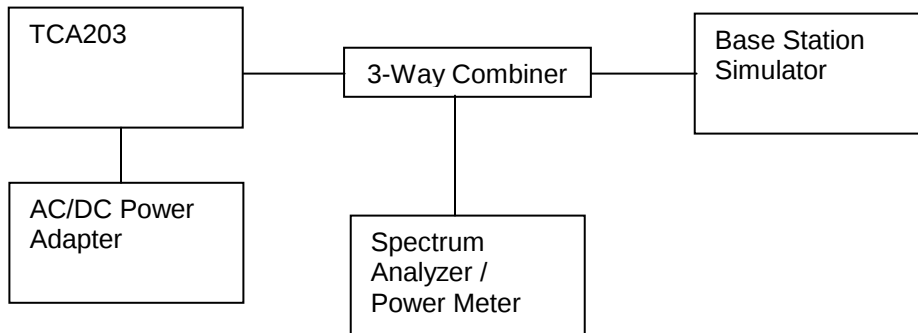
| <b>No.</b> | <b>Descriptions of EUT Exercising</b>     |
|------------|-------------------------------------------|
| 1          | Transmitting a GPRS, EDGE or WCDMA signal |
| 2          | Receive / idle mode                       |

### 3.1 System setup including cable interconnection details, support equipment and simplified block diagram

### 3.2 EUT Block Diagram:



Block Diagram for Radiated Tests



Block Diagram for Conducted Tests at the Antenna Port

**3.3 Cables:**

| Cables         |        |           |          |             |                       |
|----------------|--------|-----------|----------|-------------|-----------------------|
| Description    | Length | Shielding | Ferrites | Connection  |                       |
|                |        |           |          | From        | To                    |
| Ethernet Cable | 50 ft  | None      | None     | Test Sample | Ethernet Hub          |
| DC Power Cable | 5 ft   | None      | None     | Test Sample | AC/DC Power Converter |

**3.4 Support Equipment:**

| Support Equipment |              |              |               |
|-------------------|--------------|--------------|---------------|
| Description       | Manufacturer | Model Number | Serial Number |
| Ethernet Hub      | Netgear      | EN106        | ENT6B03054560 |
|                   |              |              |               |

## 4 Conducted Output Power

### 4.1 Test Limits

#### § 2.1046

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 §2.1033(c)(8).

#### § 24.232 (d)

Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 4.2 Test Procedure

The transmitter output was connected to a coaxial cable, the other end of which was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The EUT was placed into a call and the burst average power was measured with a power meter dBm. The power output at the transmitter antenna port was determined by adding the value of the cable insertion loss to the power reading. Tests were performed at three frequencies (low, middle, and high channels) and on the highest power levels, which can be setup on the transmitters.

The peak-to-average ratio (PAR) was measured using a spectrum analyzer with a RBW wider than the EBW of the measured signal. The delta between the peak and average trace was recorded.

### 4.3 Test Equipment Used:

| Description            | Serial Number | Manufacturer    | Model   | Cal. Date   | Cal. Due    |
|------------------------|---------------|-----------------|---------|-------------|-------------|
| Base Station Simulator | 3917          | Rohde&Schwarz   | CMW500  | 9/26/2013   | 9/26/2014   |
| Environmental Chamber  | 3947          | Test Equity     | 115A    | Time Of Use | Time Of Use |
| Spectrum Analyzer      | 3720          | Rohde & Schwarz | FSEK 30 | 9/10/2013   | 9/10/2014   |
| Multimeter/Temp Meter  | 3400          | Fluke           | 289     | 5/29/2013   | 5/29/2014   |
| Spectrum Analyzer      | 3099          | Rohde & Schwarz | FSP7    | 9/12/2013   | 9/12/2014   |
| Directional Coupler    | 08736         | Narda           | 4226-20 | Time of Use | Time of Use |

**4.4 Results:****Conducted Output Power (GPRS & EDGE Modes)**

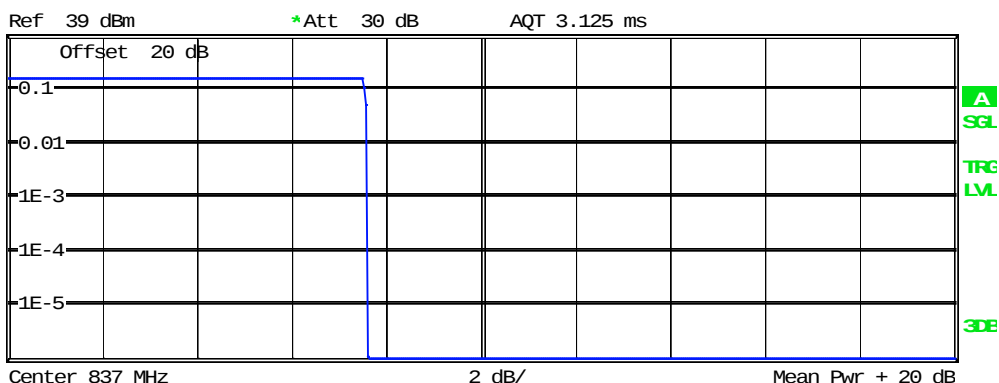
| <b>Burst Average Power (dBm)</b> |                |                        |                   |                    |
|----------------------------------|----------------|------------------------|-------------------|--------------------|
| <b>Band</b>                      | <b>Channel</b> | <b>Frequency (MHz)</b> | <b>GSM (GMSK)</b> | <b>EDGE (8PSK)</b> |
| GSM 850                          | 128            | 824.2                  | 32.19             | 26.47              |
|                                  | 192            | 837                    | 32.04             | 26.31              |
|                                  | 251            | 848.8                  | 31.77             | 26.09              |
| GSM 1900                         | 512            | 1850.2                 | 28.37             | 25.28              |
|                                  | 661            | 1880                   | 28.58             | 25.32              |
|                                  | 810            | 1909.8                 | 28.72             | 25.3               |

**Conducted Output Power (UMTS Modes)**

| <b>Average Power (dBm)</b> |                |                        |                  |
|----------------------------|----------------|------------------------|------------------|
| <b>Band</b>                | <b>Channel</b> | <b>Frequency (MHz)</b> | <b>Avg. Pwr.</b> |
| WCDMA Band V               | 4132           | 826.4                  | 22.10            |
|                            | 4182           | 836.4                  | 22.10            |
|                            | 4233           | 846.6                  | 22.02            |
| WCDMA Band II              | 9262           | 1852.4                 | 21.98            |
|                            | 9400           | 1880                   | 21.95            |
|                            | 9538           | 1907.6                 | 21.75            |

Peak-to-Average Ratio – GPRS Mode (GSM850 Band)

RBW 10 MHz



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 23.68 dBm

Peak 31.30 dBm

Crest 7.62 dB

10 % 7.56 dB

1 % 7.64 dB

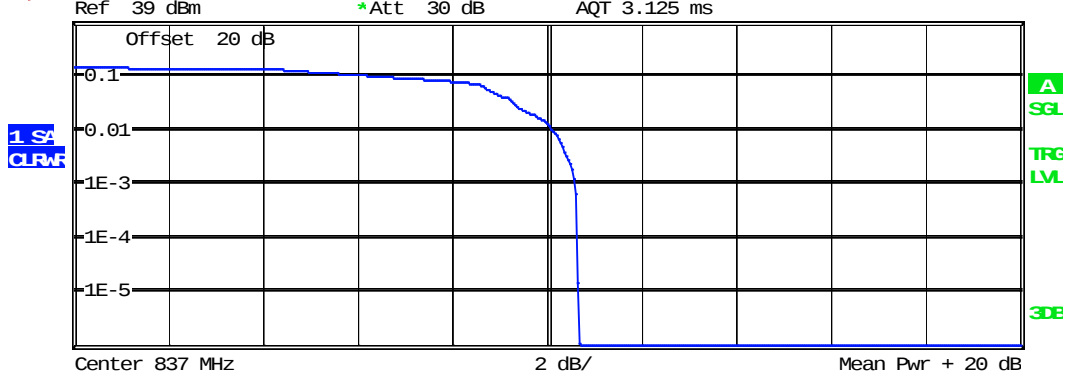
.1 % 7.64 dB

.01 % 7.64 dB

Date: 13.JAN.2014 15:46:05

## Peak-to-Average Ratio – EDGE Mode (GSM850 Band)

RBW 10 MHz



## Complementary Cumulative Distribution Function (100000 samples)

## Trace 1

Mean 18.24 dBm

Peak 28.90 dBm

Crest 10.66 dB

10 % 7.04 dB

1 % 10.16 dB

.1 % 10.60 dB

.01 % 10.68 dB

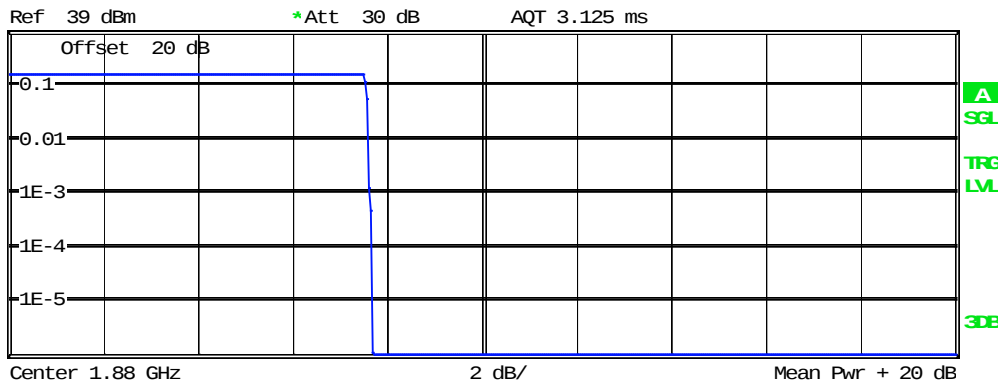
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Peak-to-Average Ratio – GPRS Mode (GSM1900 Band)

RBW 10 MHz



1 SA  
CUR



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 19.52 dBm

Peak 27.21 dBm

Crest 7.69 dB

10 % 7.56 dB

1 % 7.64 dB

.1 % 7.64 dB

.01 % 7.72 dB

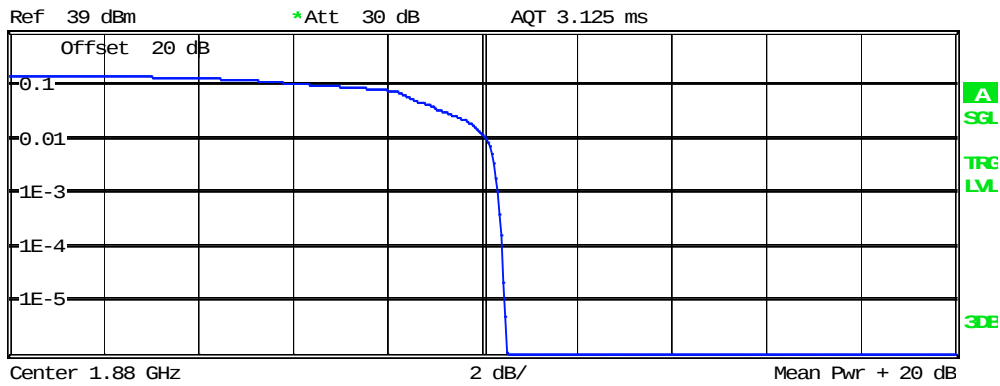
Date: 13.JAN.2014 15:58:18

Peak-to-Average Ratio – EDGE Mode (GSM1900 Band)

RBW 10 MHz



1 SA  
CLR



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 16.49 dBm

Peak 27.00 dBm

Crest 10.51 dB

10 % 7.28 dB

1 % 10.12 dB

.1 % 10.36 dB

.01 % 10.44 dB

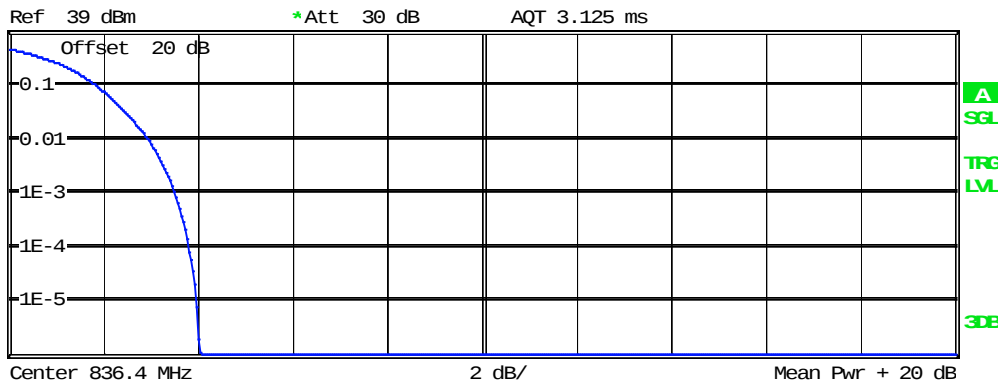
Date: 13.JAN.2014 15:59:33

Peak-to-Average Ratio – WCDMA Band V

RBW 10 MHz



1 SA  
CUR



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 21.05 dBm

Peak 25.09 dBm

Crest 4.05 dB

10 % 1.88 dB

1 % 2.96 dB

.1 % 3.52 dB

.01 % 3.84 dB

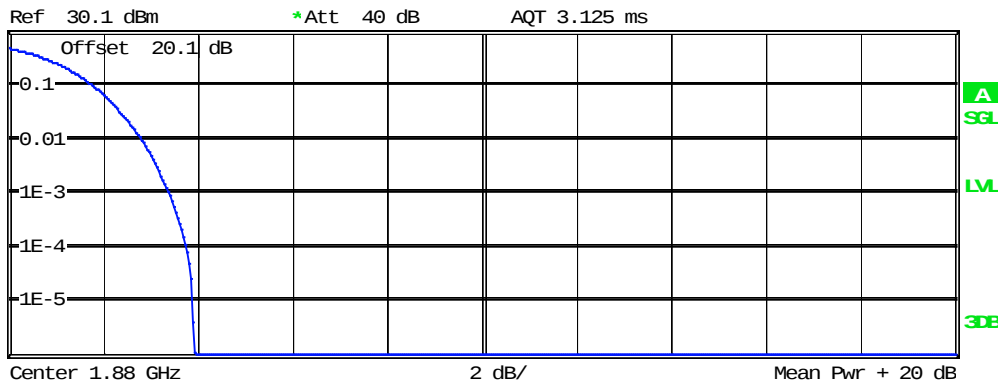
Date: 13.JAN.2014 15:55:31

Peak-to-Average Ratio – WCDMA Band II

RBW 10 MHz



1 SA  
CUR



Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean 20.62 dBm

Peak 24.54 dBm

Crest 3.92 dB

10 % 1.80 dB

1 % 2.84 dB

.1 % 3.40 dB

.01 % 3.76 dB

Date: 9.JAN.2014 11:40:48

## 5 Occupied Bandwidth

### 5.1 Test Limits

#### §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.

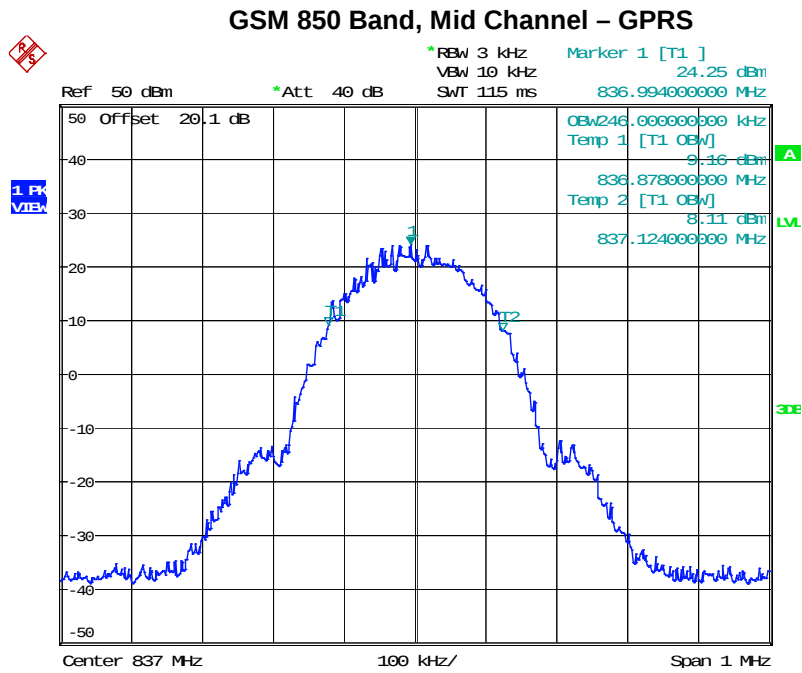
### 5.2 Test Procedure

The EUT was connected to a spectrum analyzer using a coaxial cable and power divider. The EUT was placed into a call using base station simulator. The base station simulator was set to force the EUT to its maximum power setting. The occupied bandwidth function of the analyzer was used to automatically generate the occupied bandwidth plots below. A peak detector was used for this measurement.

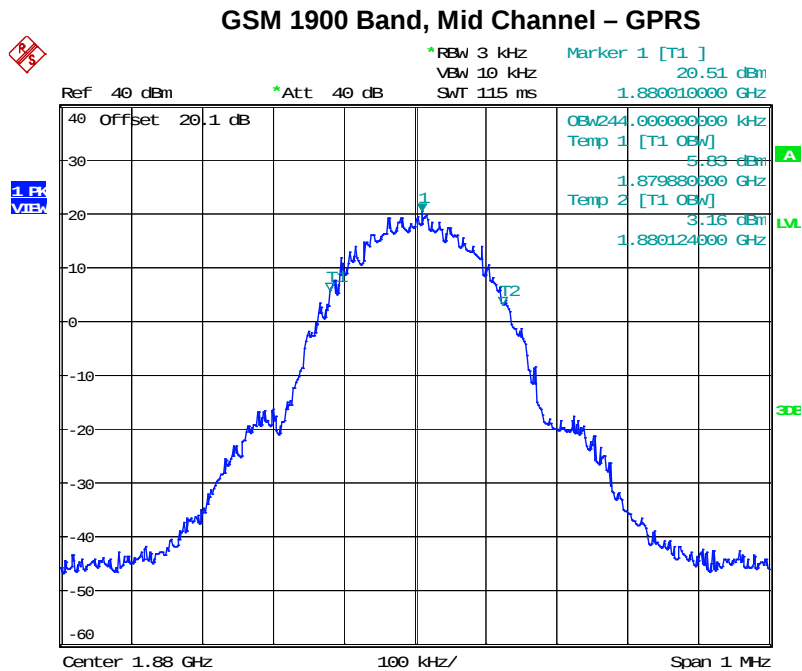
### 5.3 Test Equipment Used:

| Description            | Serial Number | Manufacturer    | Model   | Cal. Date   | Cal. Due    |
|------------------------|---------------|-----------------|---------|-------------|-------------|
| Base Station Simulator | 3917          | Rohde&Schwarz   | CMW500  | 9/26/2013   | 9/26/2014   |
| Spectrum Analyzer      | 3099          | Rohde & Schwarz | FSP7    | 9/12/2013   | 9/12/2014   |
| Directional Coupler    | 08736         | Narda           | 4226-20 | Time of Use | Time of Use |

## 5.4 Results:

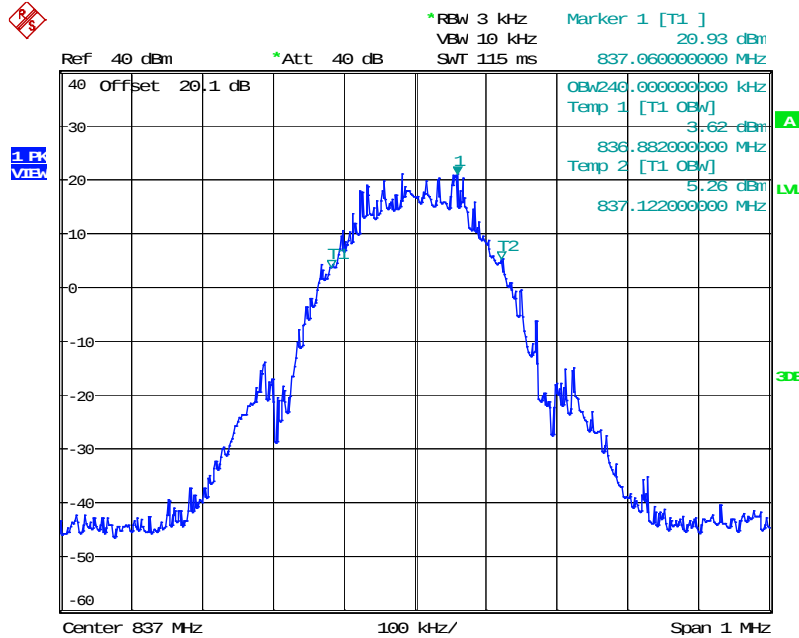


Date: 9.JAN.2014 13:49:41



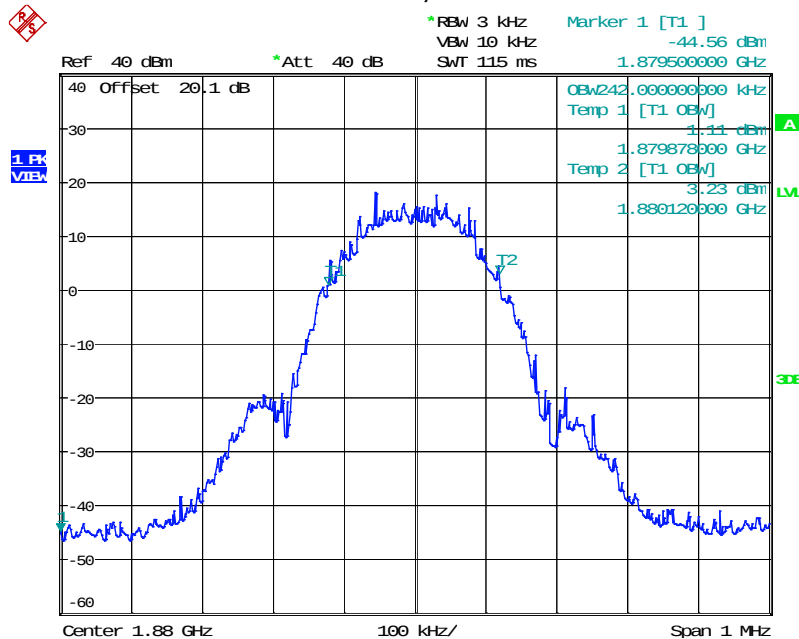
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### GSM 850 Band, Mid Channel – EDGE



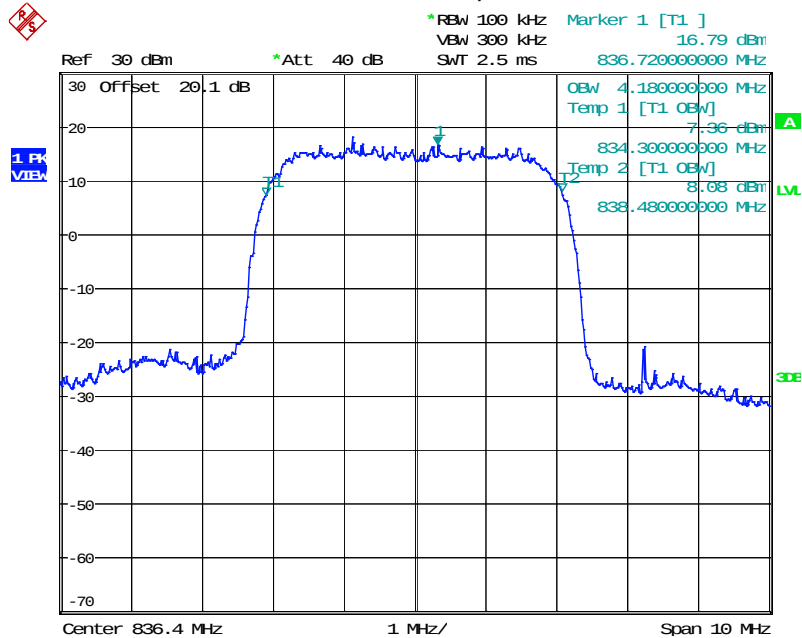
Date: 9.JAN.2014 13:51:58

### GSM 1900 Band, Mid Channel – EDGE



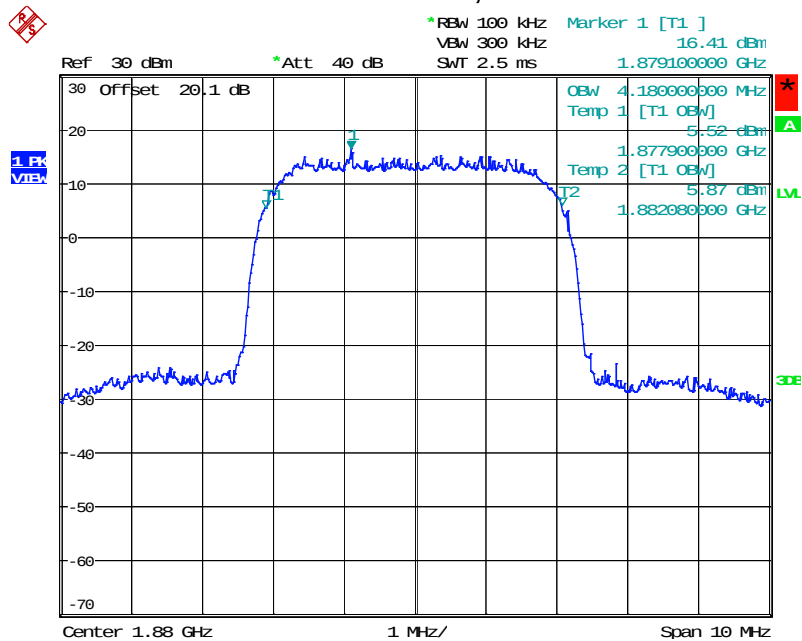
Date: 9.JAN.2014 13:54:56

### WCDMA Band V, Mid Channel



Date: 9.JAN.2014 13:45:21

### WCDMA Band II, Mid Channel



Date: 9.JAN.2014 13:44:22

## 6 Conducted Spurious Emissions at Antenna Terminals

### 6.1 Test Limits

#### § 2.1049

The occupied bandwidth, that 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 shall be measured under the following conditions as applicable:

- (h) Transmitters employing digital modulation techniques—when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

#### § 2.1051

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

#### § 22.917

- (a) Out of band emissions. 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.
- (b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth ( i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

#### § 24.238

- (a) Out of band emissions. 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.
- (b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth ( i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

## 6.2 Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The base station simulator was set to force the EUT to its maximum power setting. The resolution bandwidth of the spectrum analyzer was set at 100kHz or 1MHz depending on the transmit band and the detector was set to peak detection for general scans up to the 10<sup>th</sup> harmonic. Emissions scans near the fundamental were measured using an RMS detector. Sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

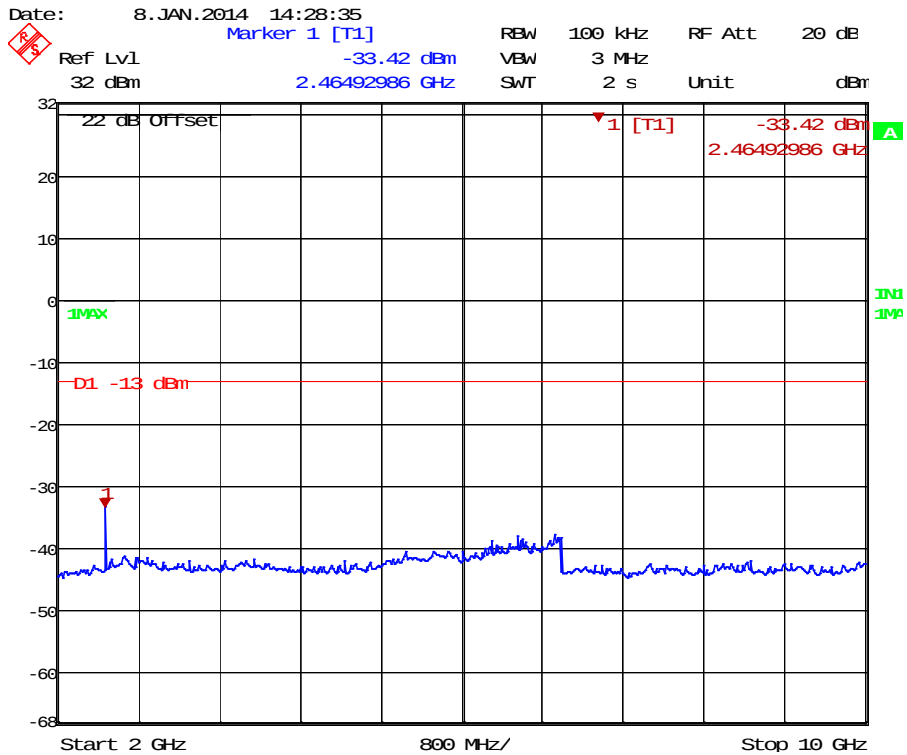
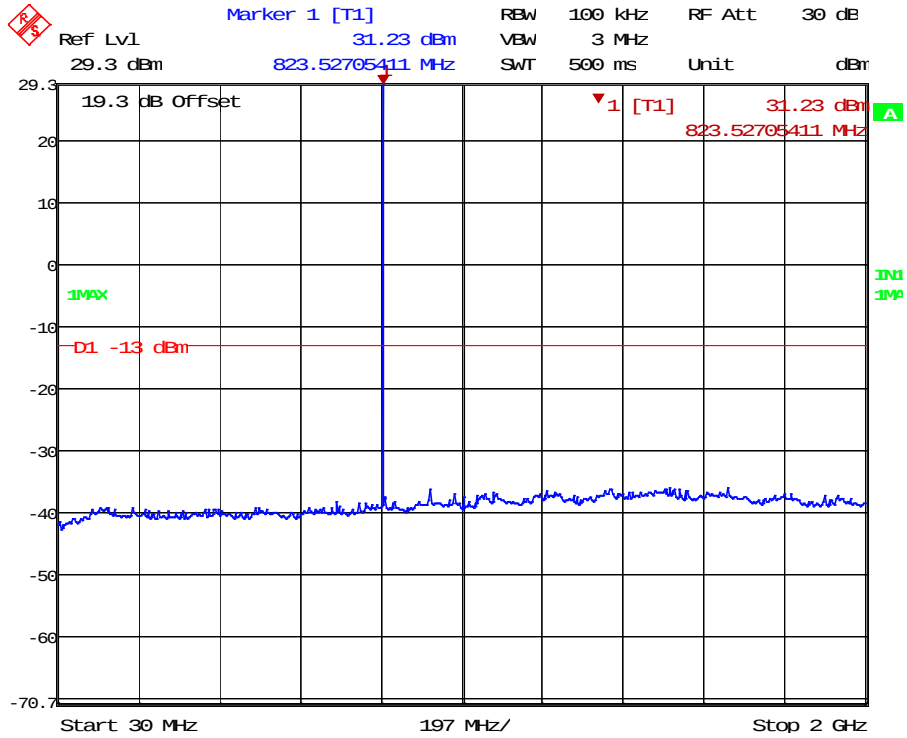
## 6.3 Test Equipment Used:

| Description            | Serial Number | Manufacturer    | Model   | Cal. Date   | Cal. Due    |
|------------------------|---------------|-----------------|---------|-------------|-------------|
| Base Station Simulator | 3917          | Rohde&Schwarz   | CMW500  | 9/26/2013   | 9/26/2014   |
| Spectrum Analyzer      | 3720          | Rohde & Schwarz | FSEK 30 | 9/10/2013   | 9/10/2014   |
| Multimeter/Temp Meter  | 3400          | Fluke           | 289     | 5/29/2013   | 5/29/2014   |
| Spectrum Analyzer      | 3099          | Rohde & Schwarz | FSP7    | 9/12/2013   | 9/12/2014   |
| Directional Coupler    | 08736         | Narda           | 4226-20 | Time of Use | Time of Use |

## 6.4 Results:

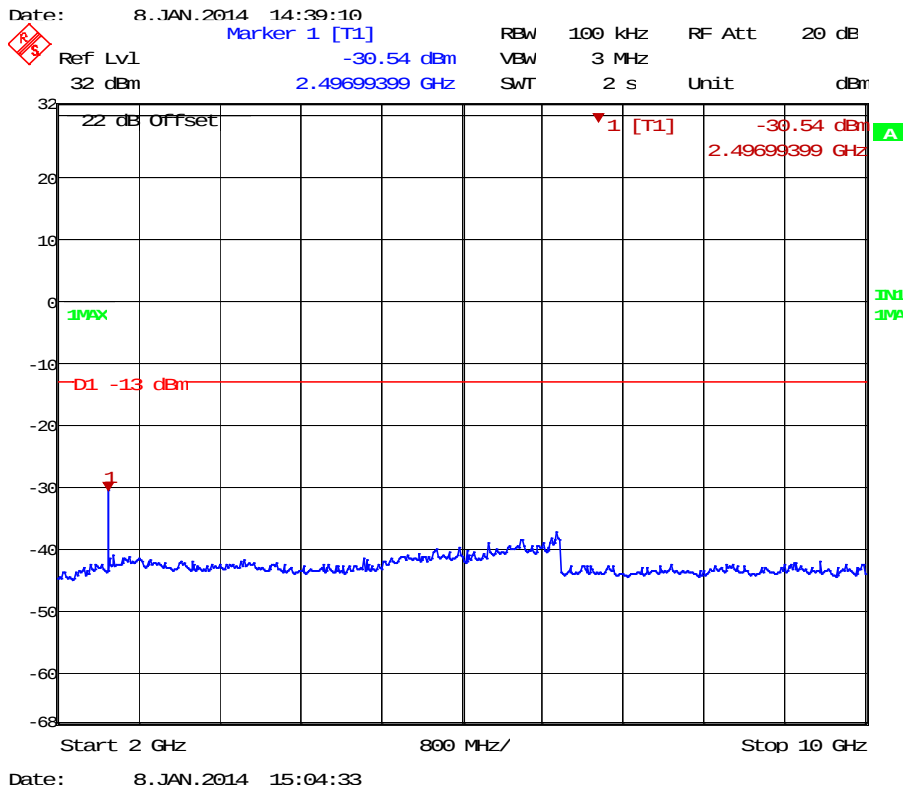
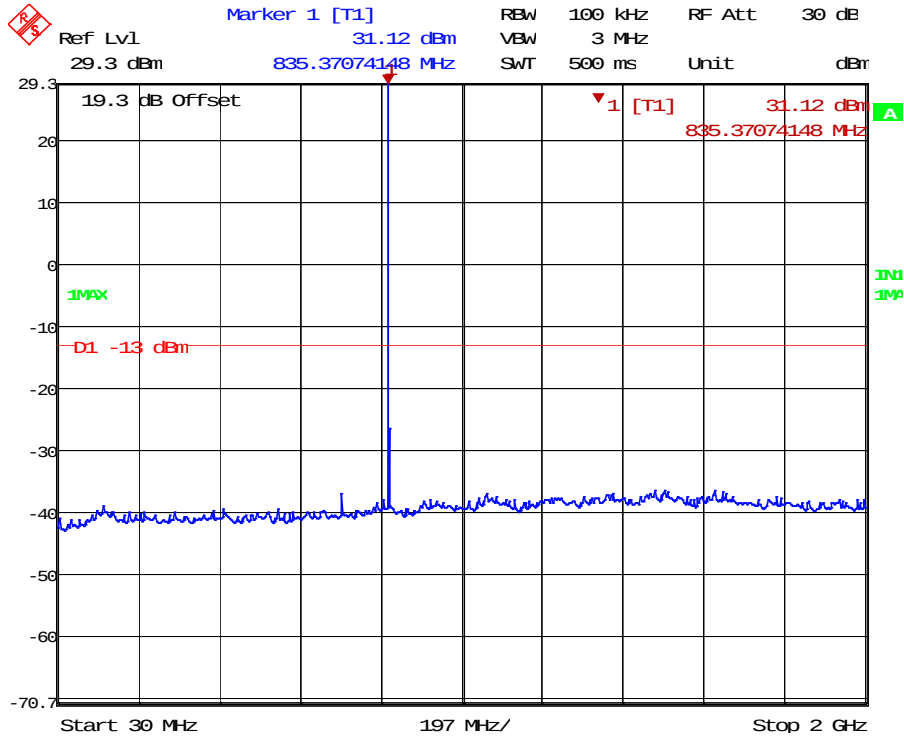
The following plots show that all spurious emissions are attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. Plots for emissions within 1MHz of the band edge as well as for emission outside of this range are shown.

### GSM 850 Band - Low Channel - GPRS

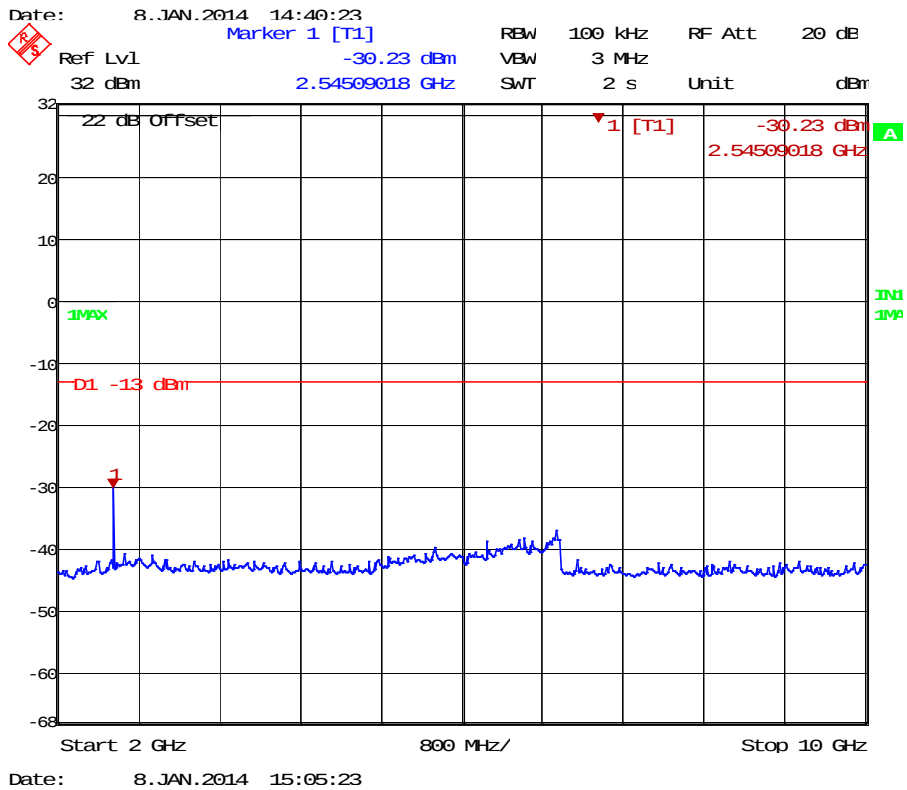
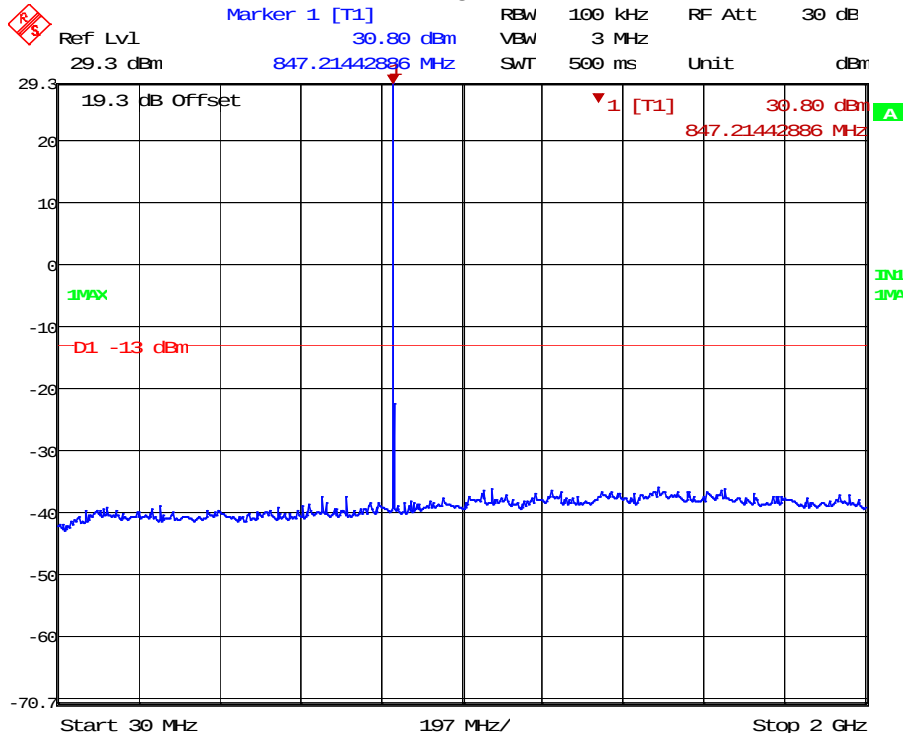


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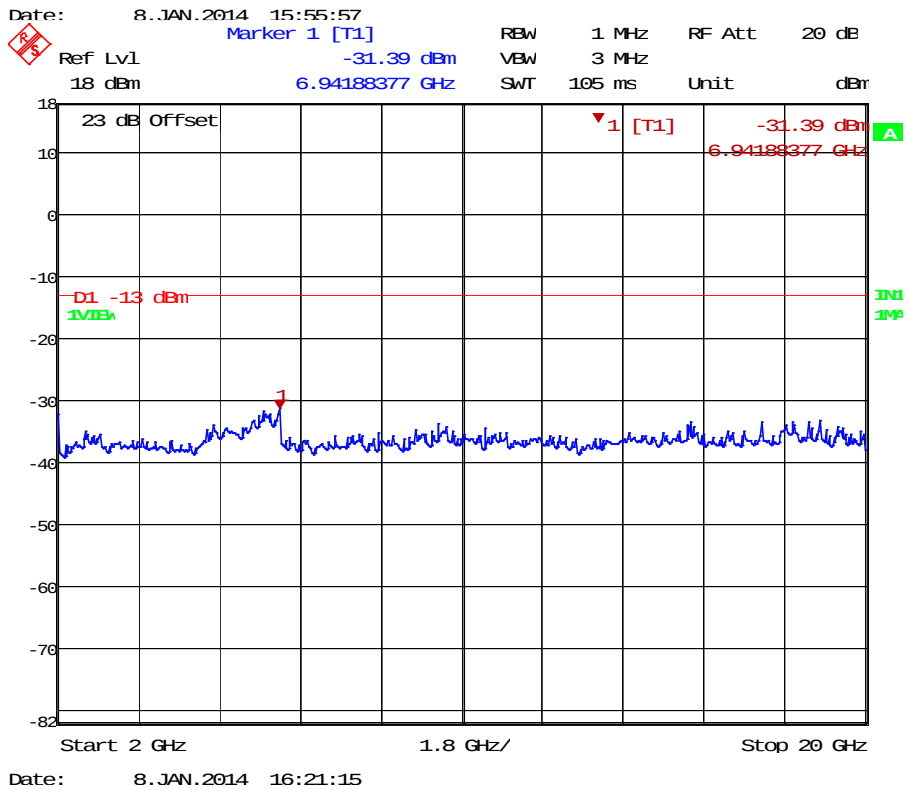
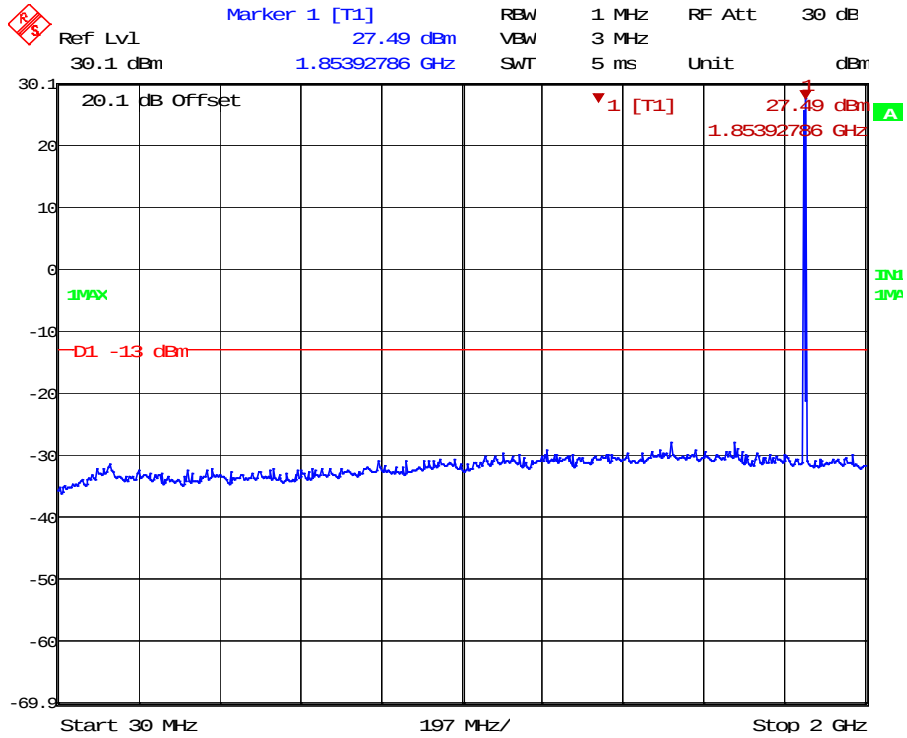
GSM 850 Band – Mid Channel – GPRS



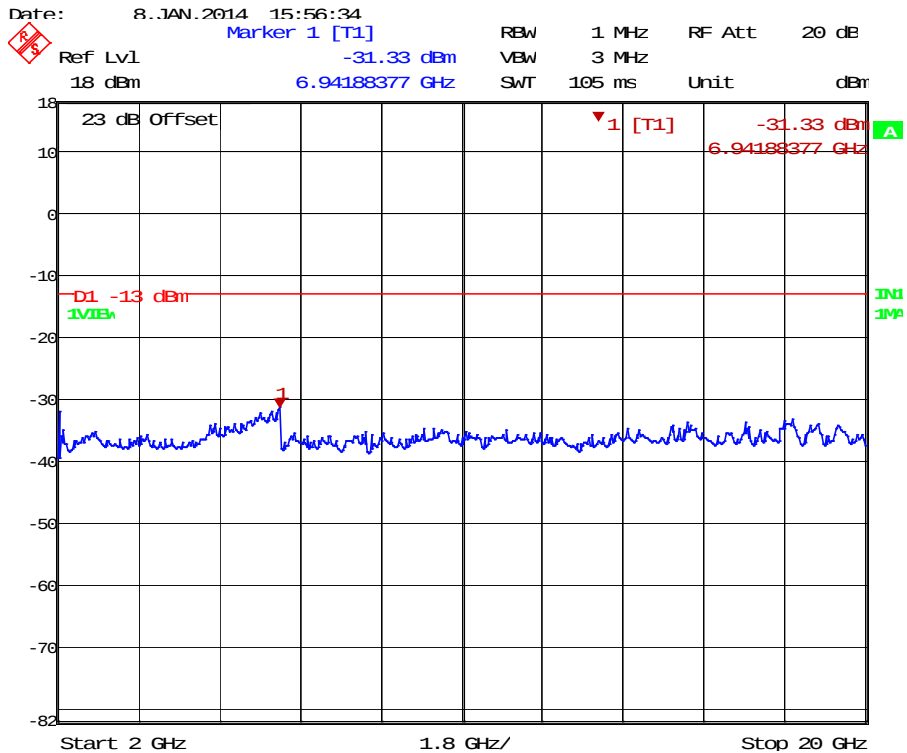
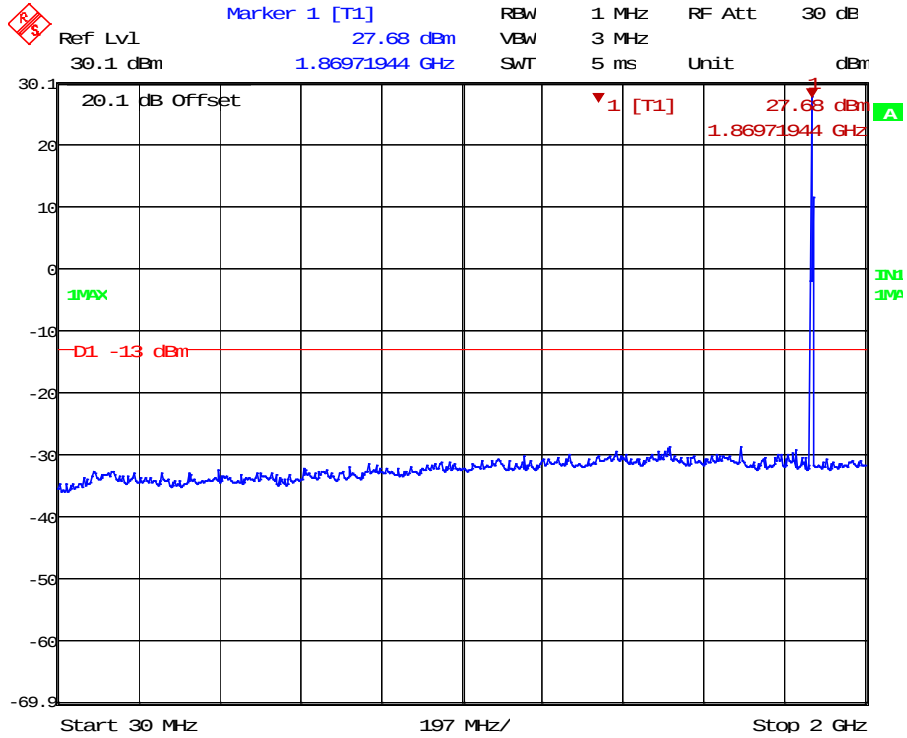
GSM 850 Band - High Channel - GPRS



GSM 1900 Band - Low Channel - GPRS

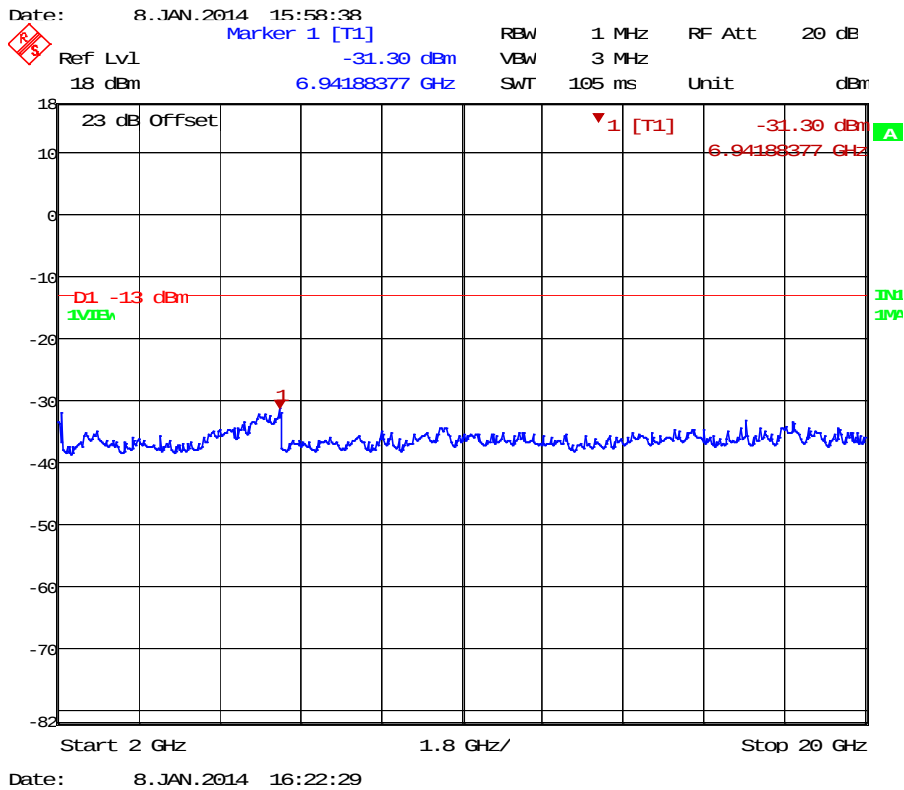
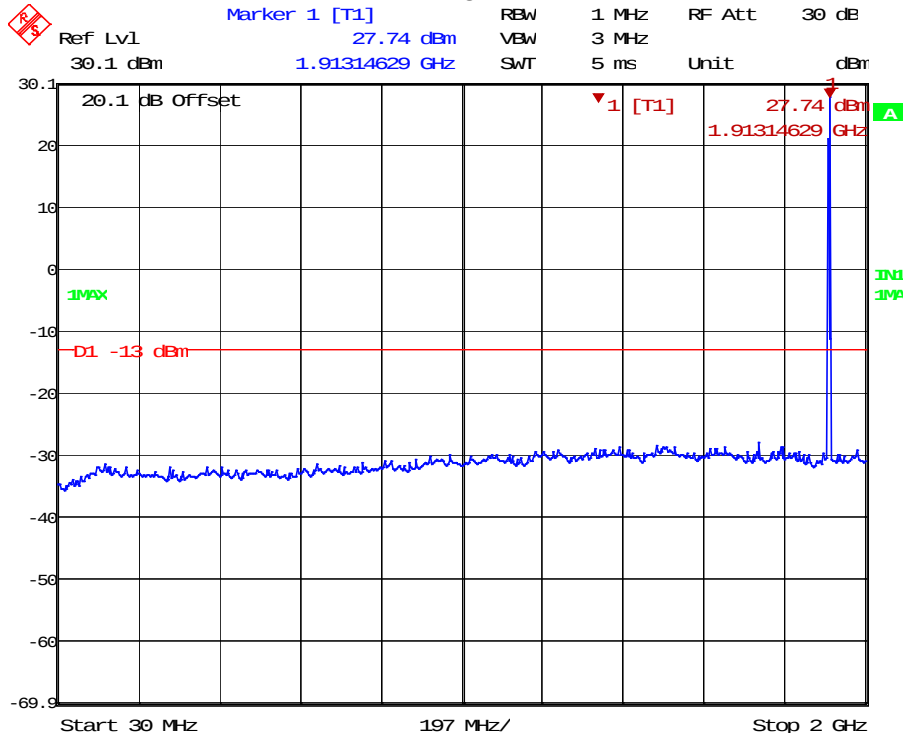


### GSM 1900 Band – Mid Channel – GPRS

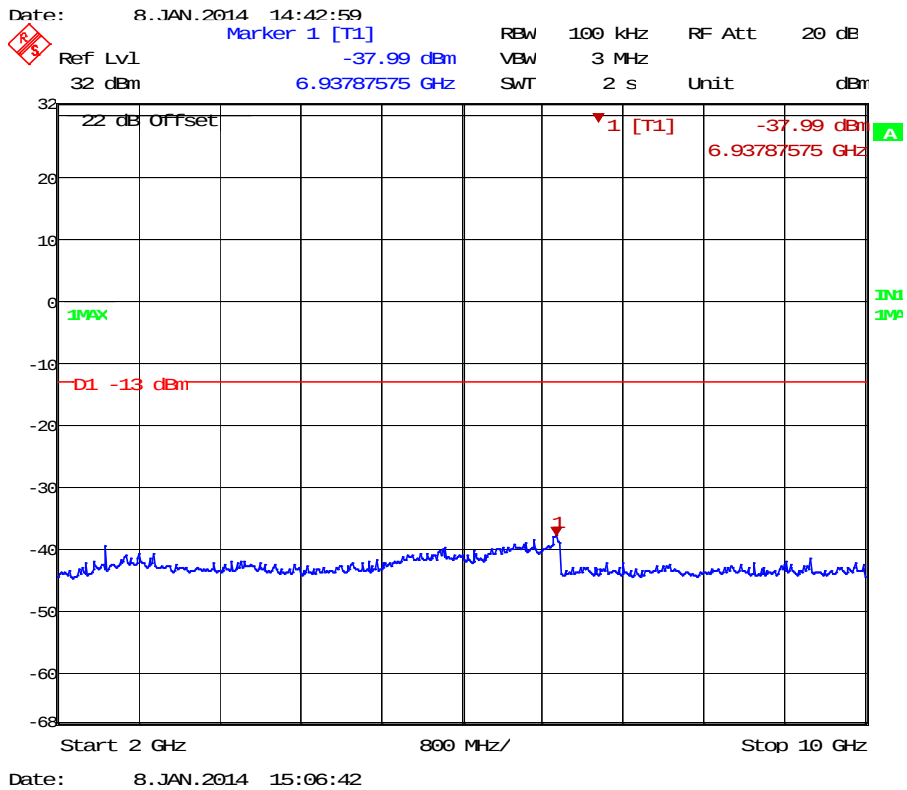
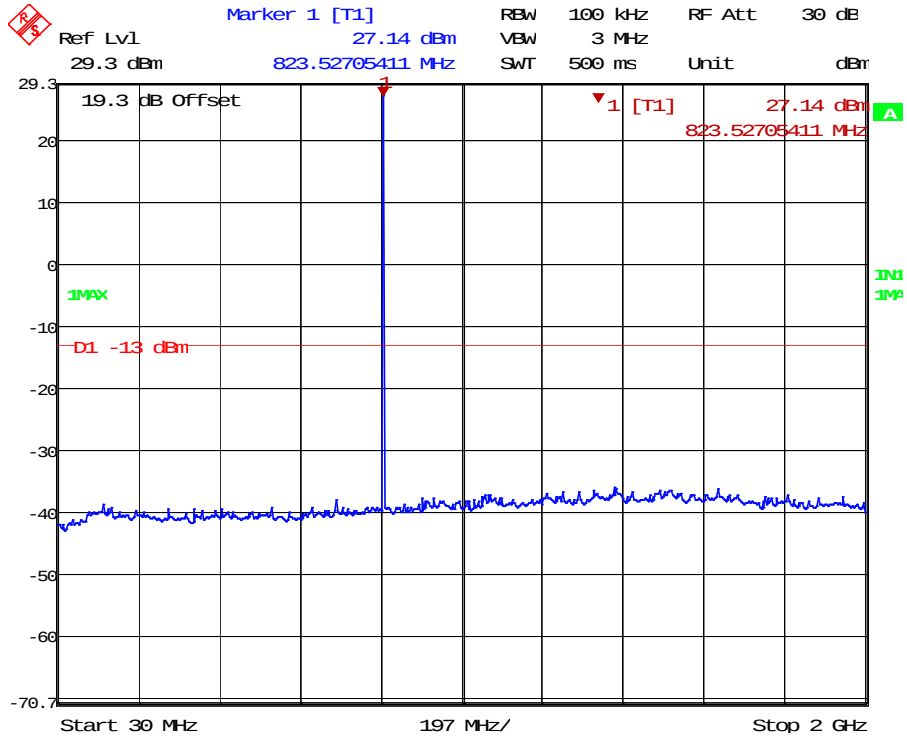


Date: 8. JAN. 2014 16:21:48

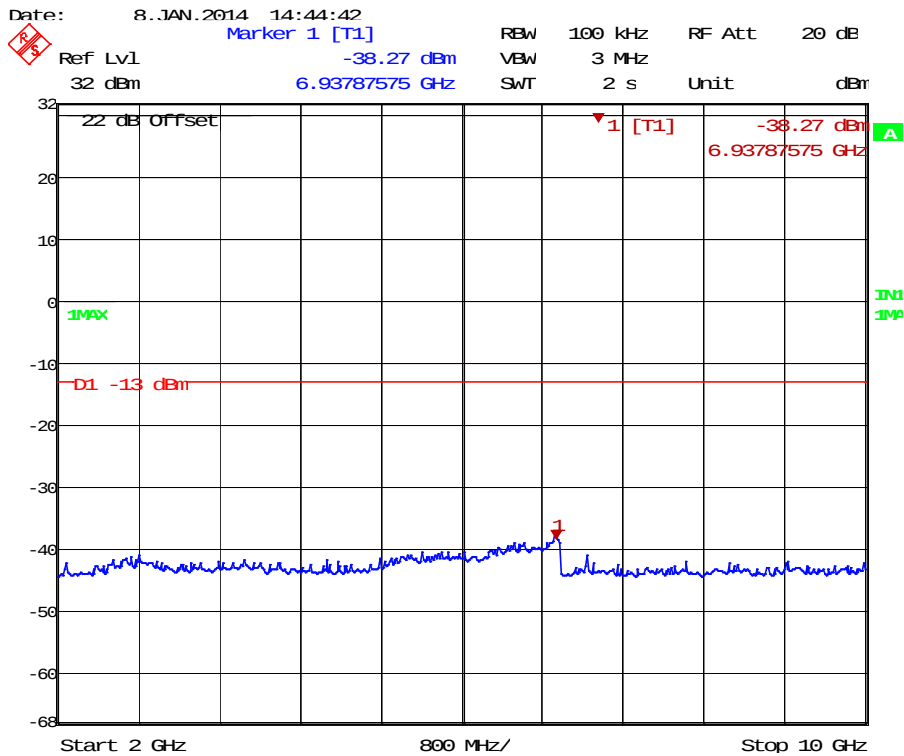
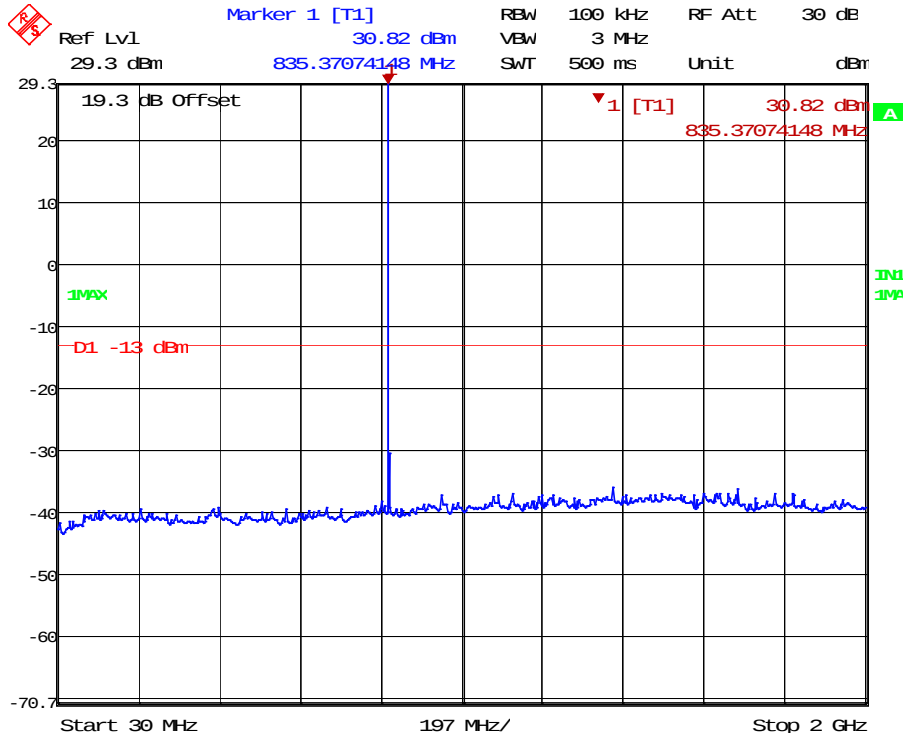
GSM 1900 Band - High Channel - GPRS



GSM 850 Band - Low Channel - EDGE

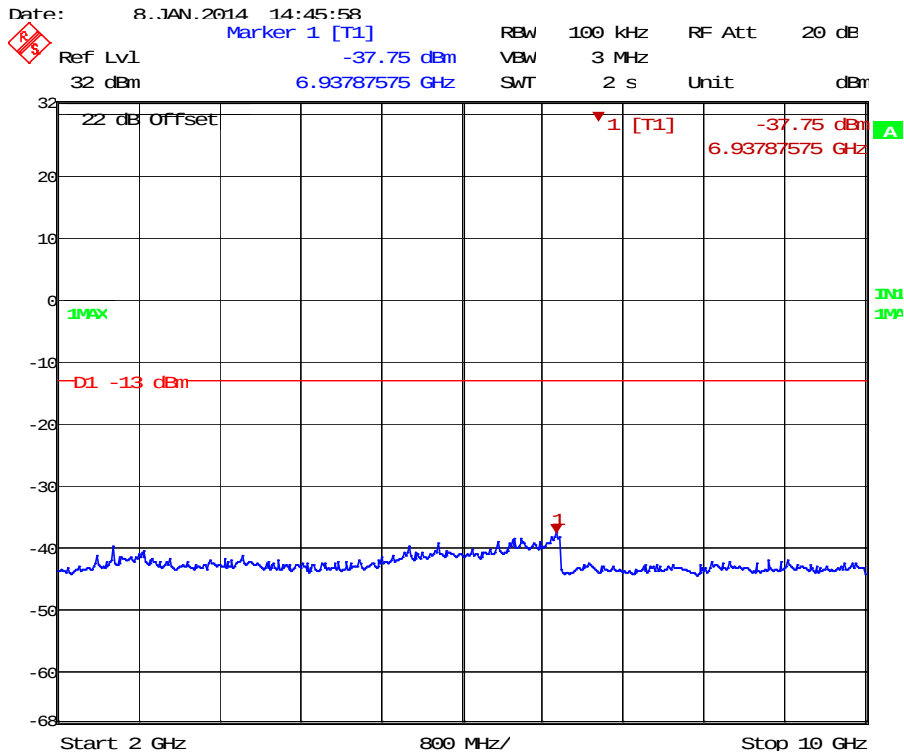
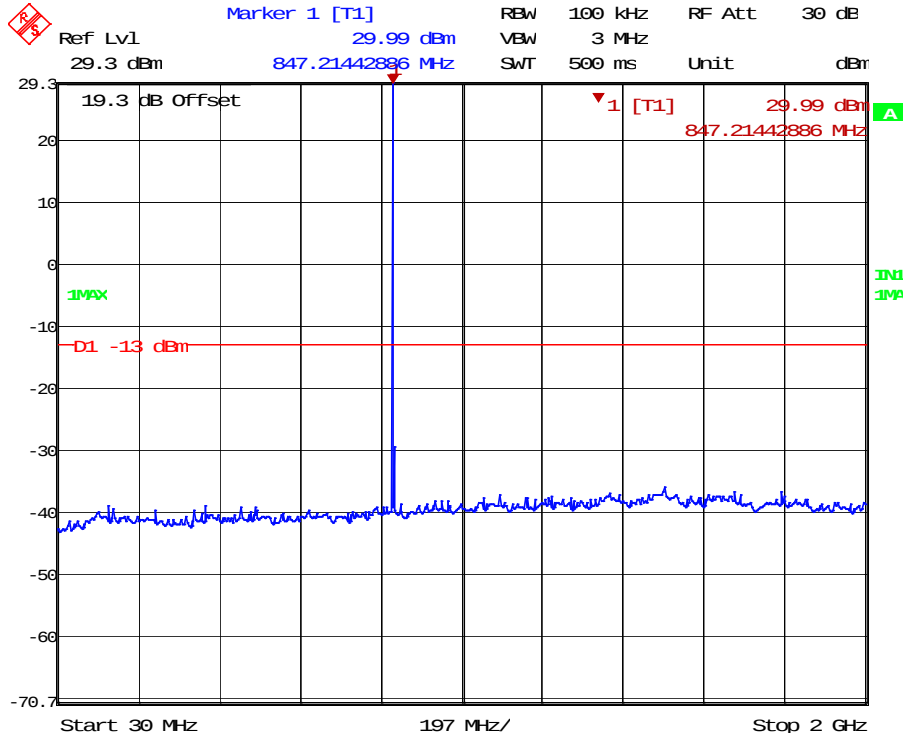


GSM 850 Band – Mid Channel – EDGE



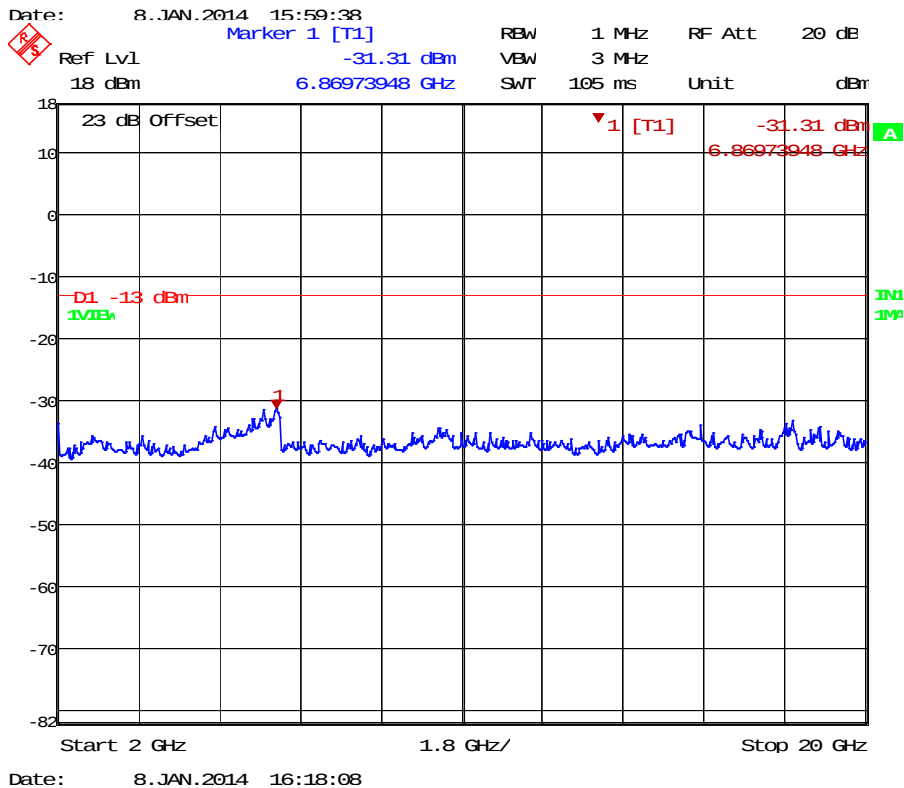
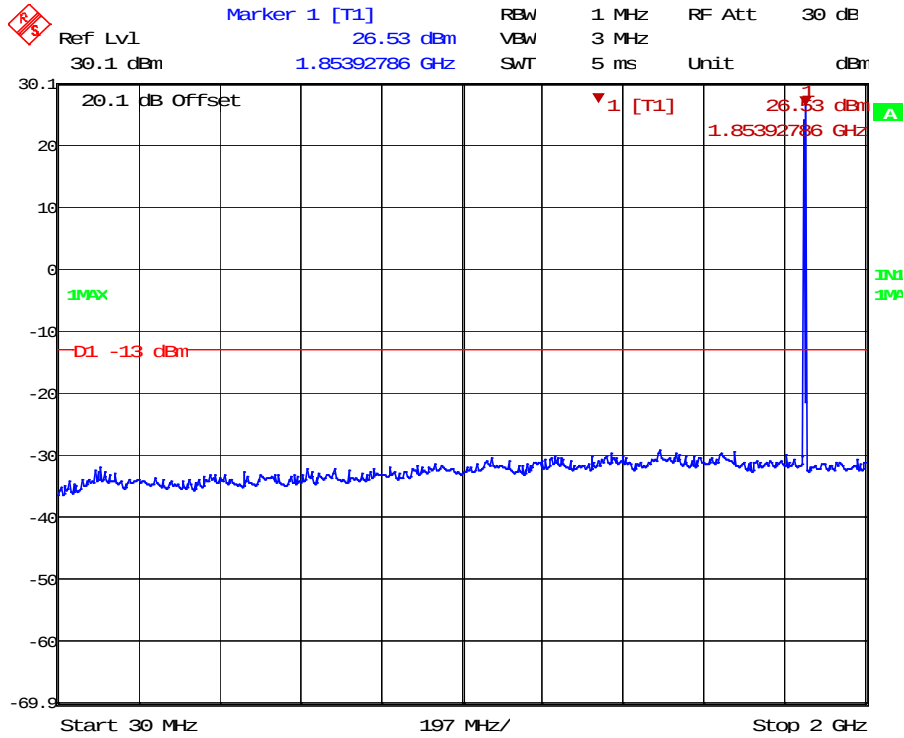
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### GSM 850 Band - High Channel - EDGE

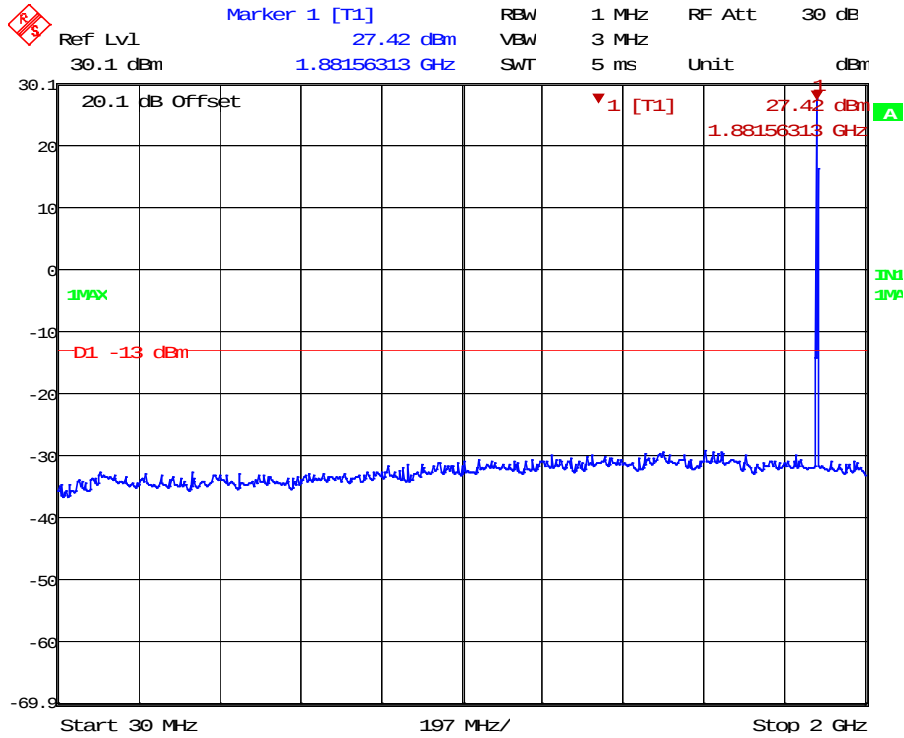


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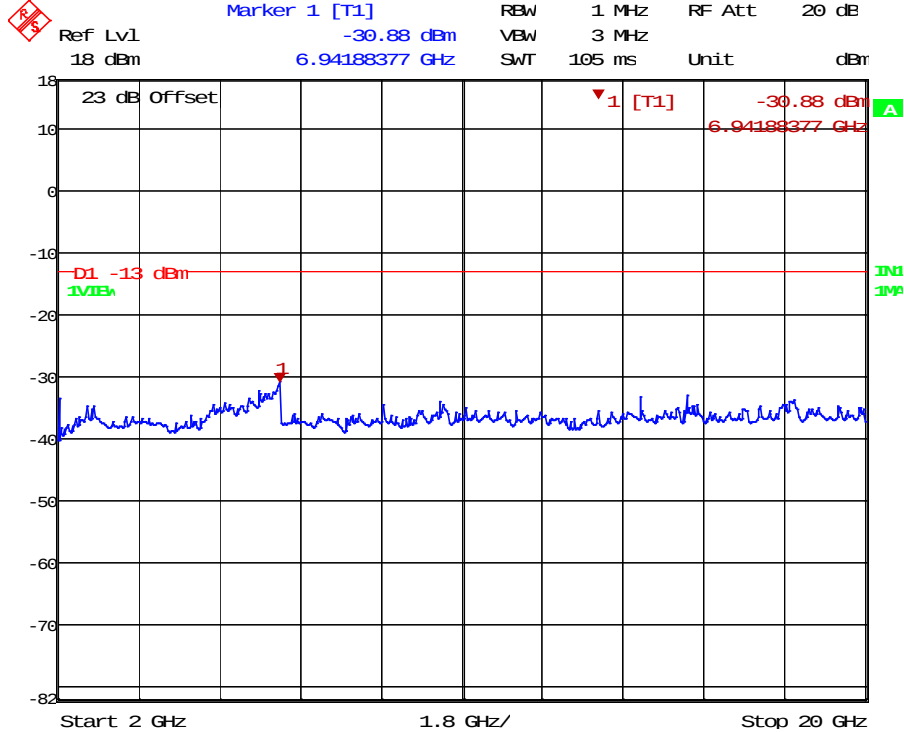
GSM 1900 Band - Low Channel - EDGE



### GSM 1900 Band – Mid Channel – EDGE

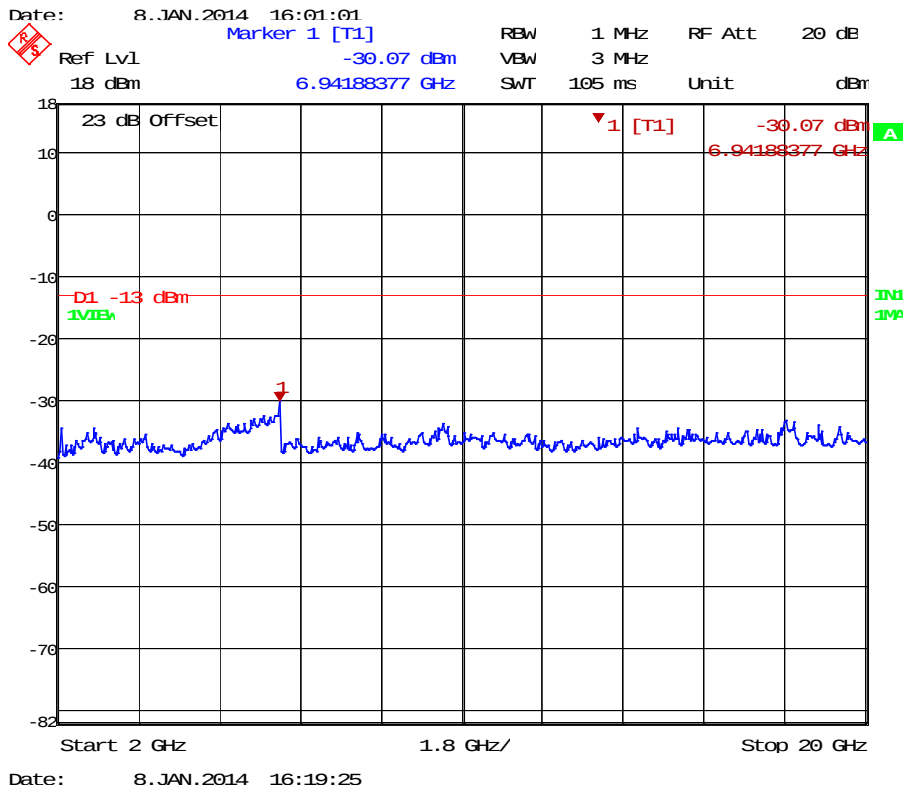
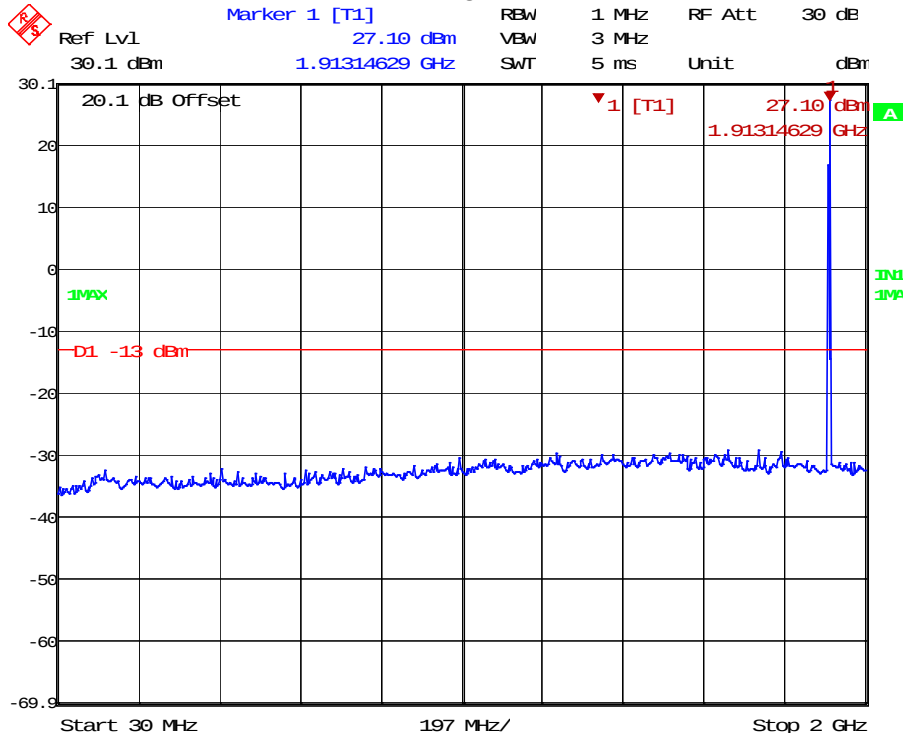


Date: 8.JAN.2014 16:00:40

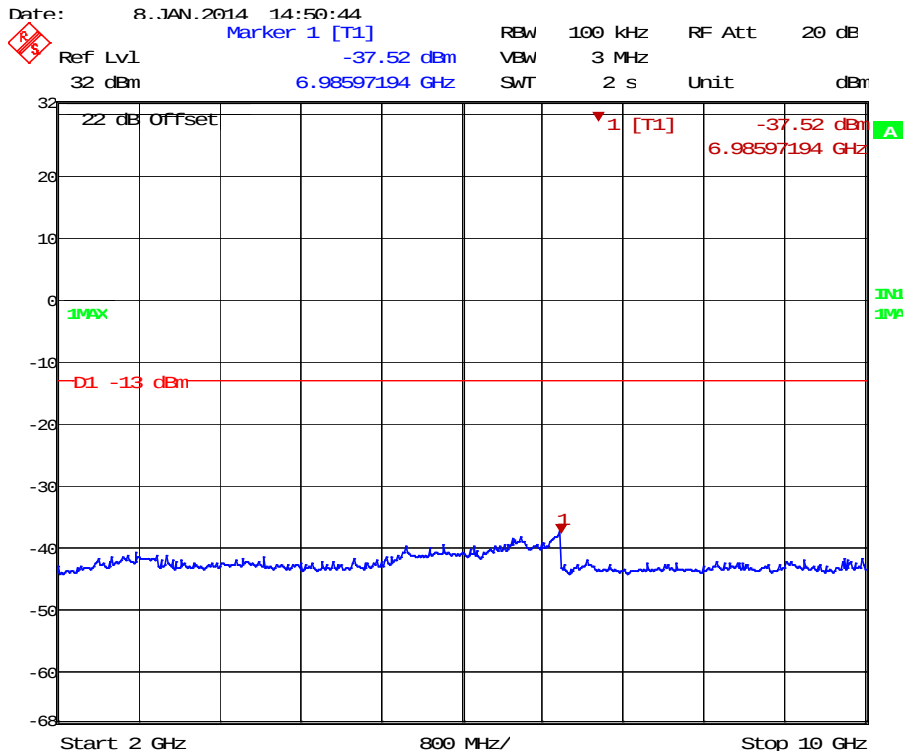
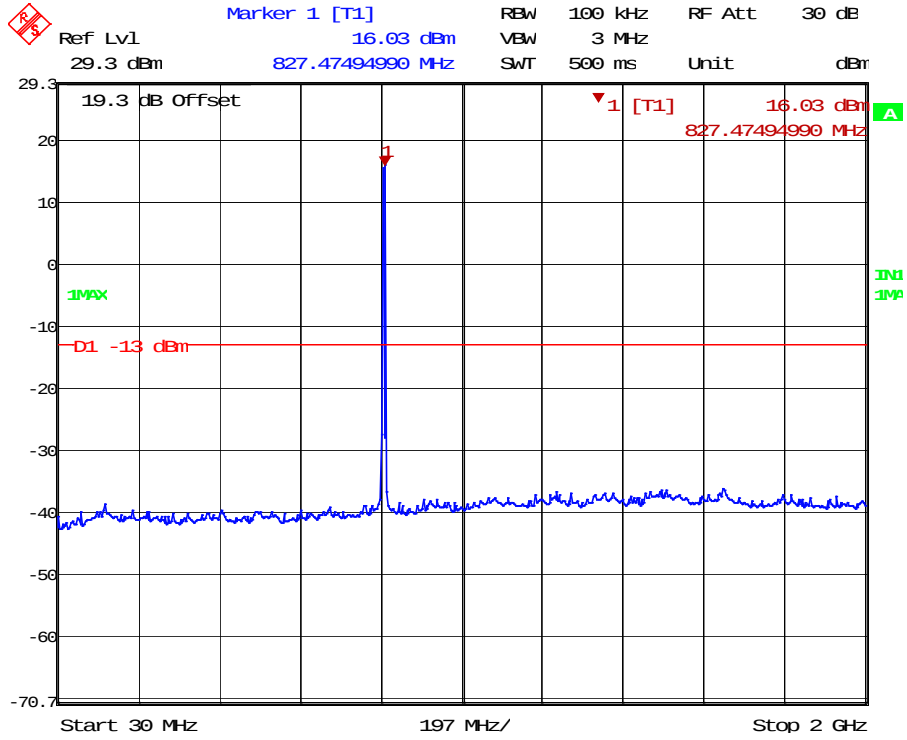


Date: 8.JAN.2014 16:18:47

GSM 1900 Band - High Channel - EDGE

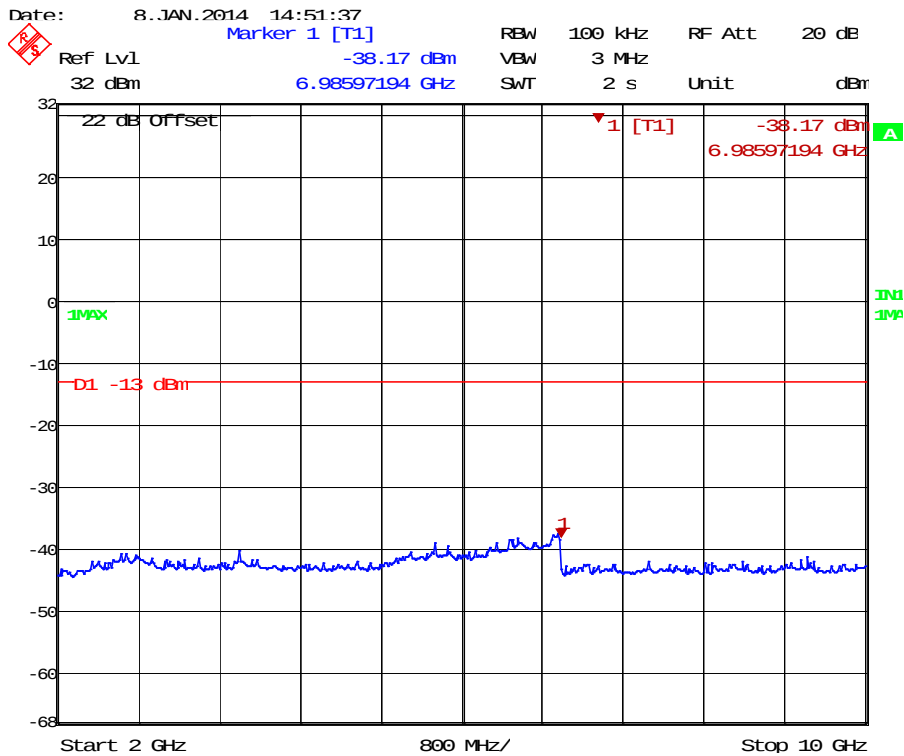
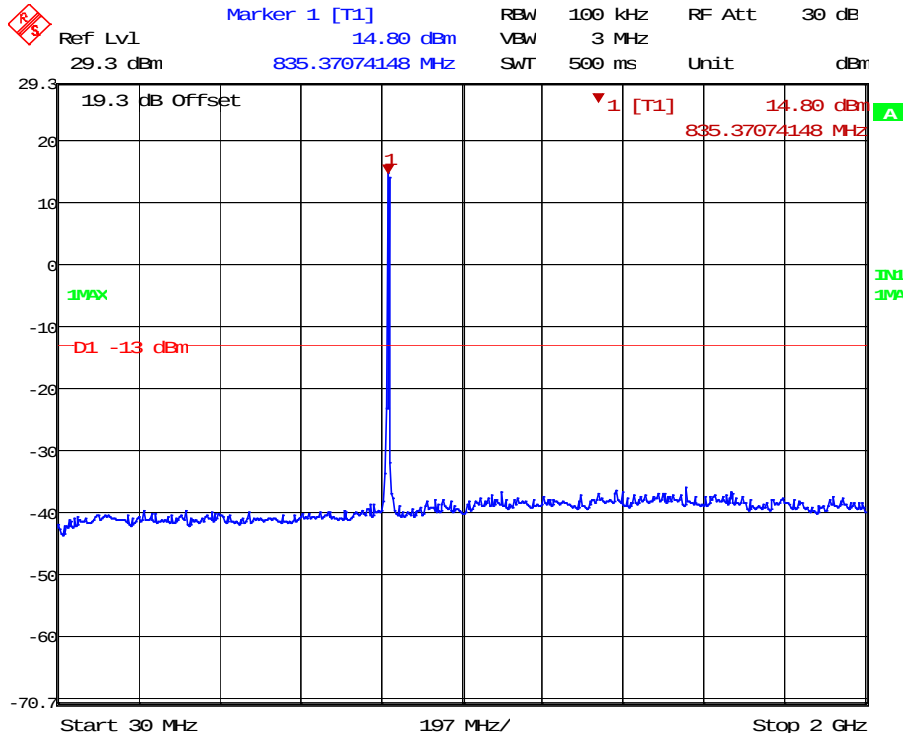


### WCDMA Band V - Low Channel



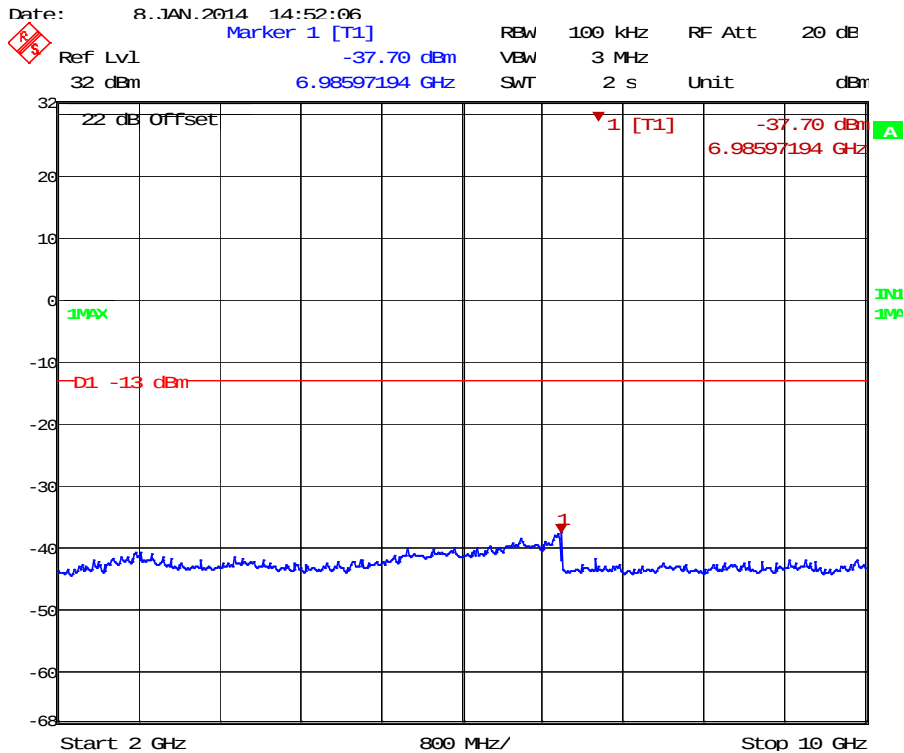
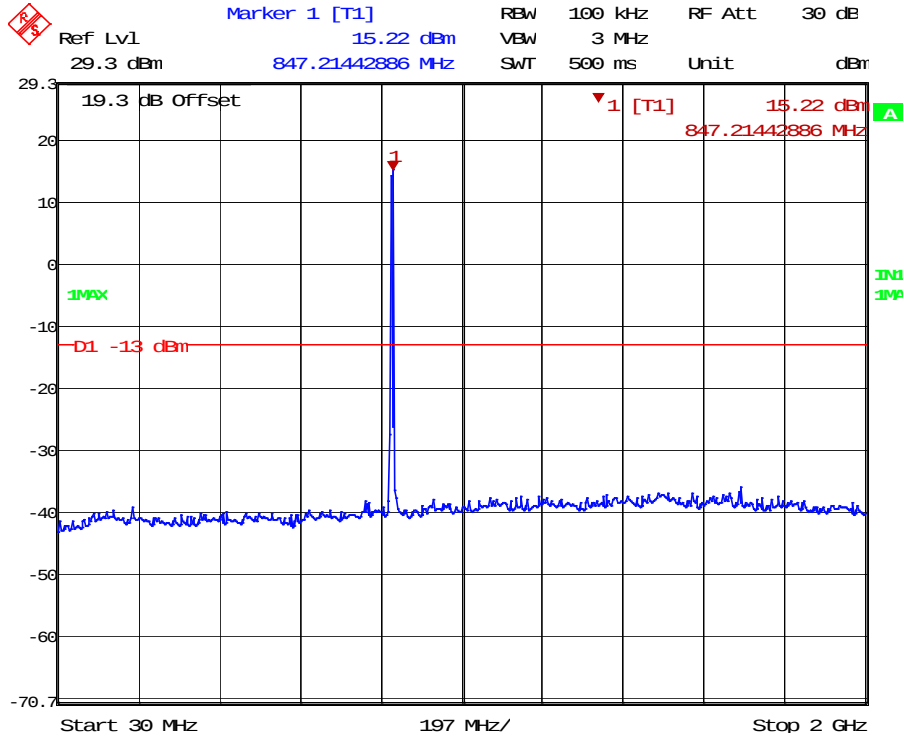
Date: 8. JAN. 2014 14:59:03

WCDMA Band V - Mid Channel



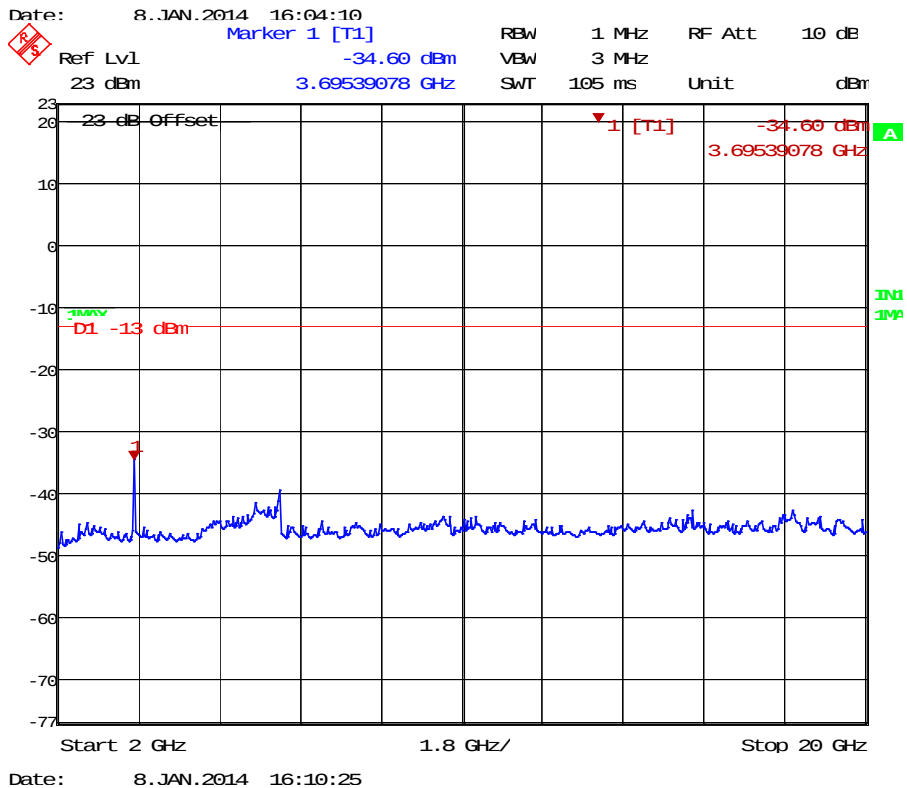
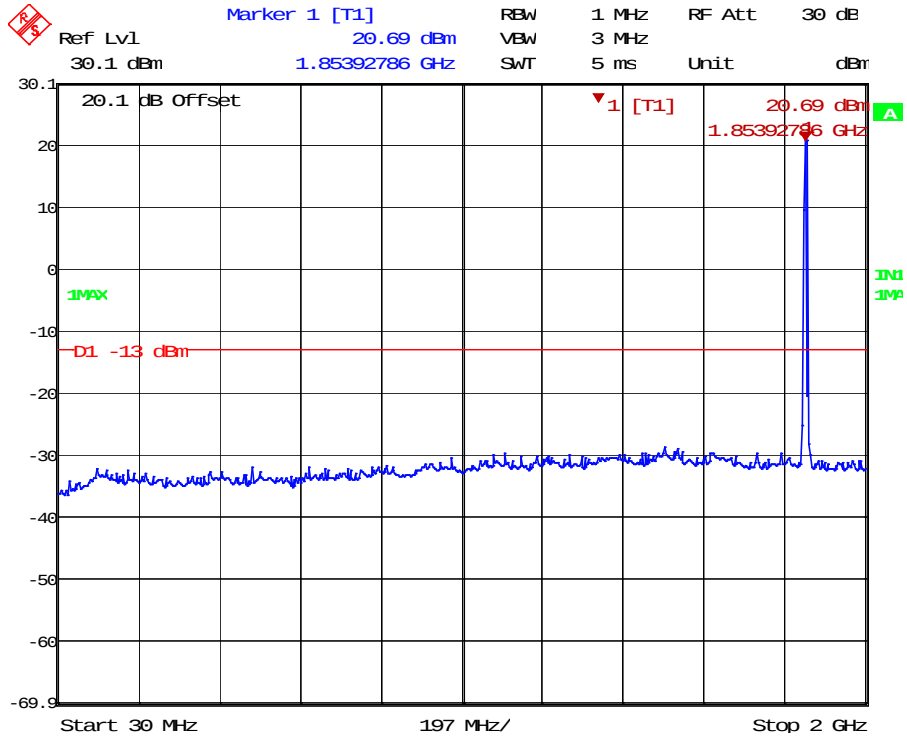
Date: 8..JAN.2014 14:56:57

### WCDMA Band V - High Channel

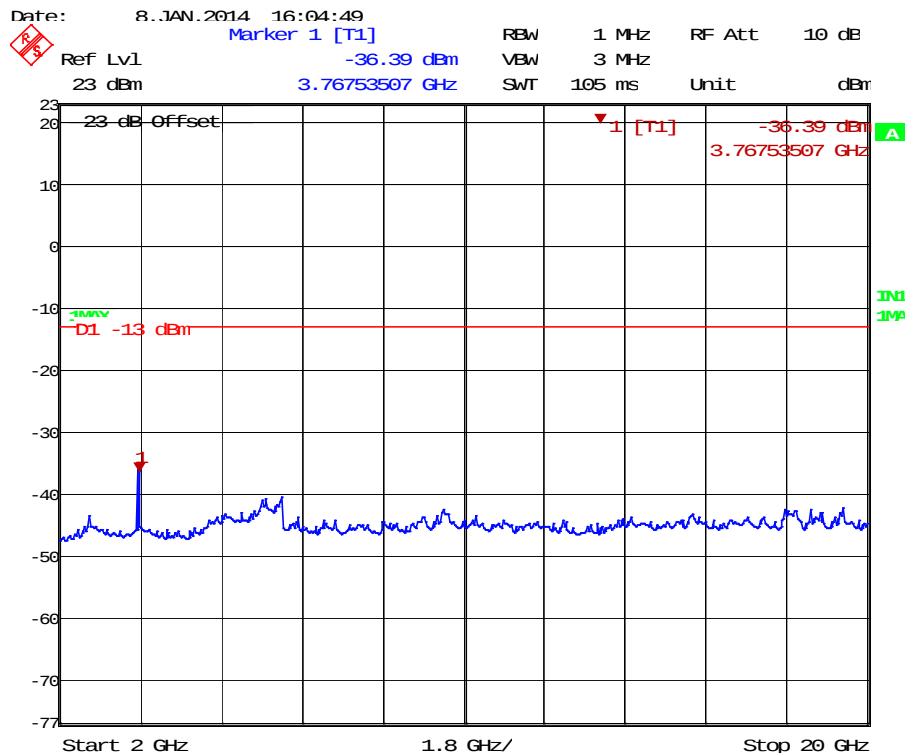
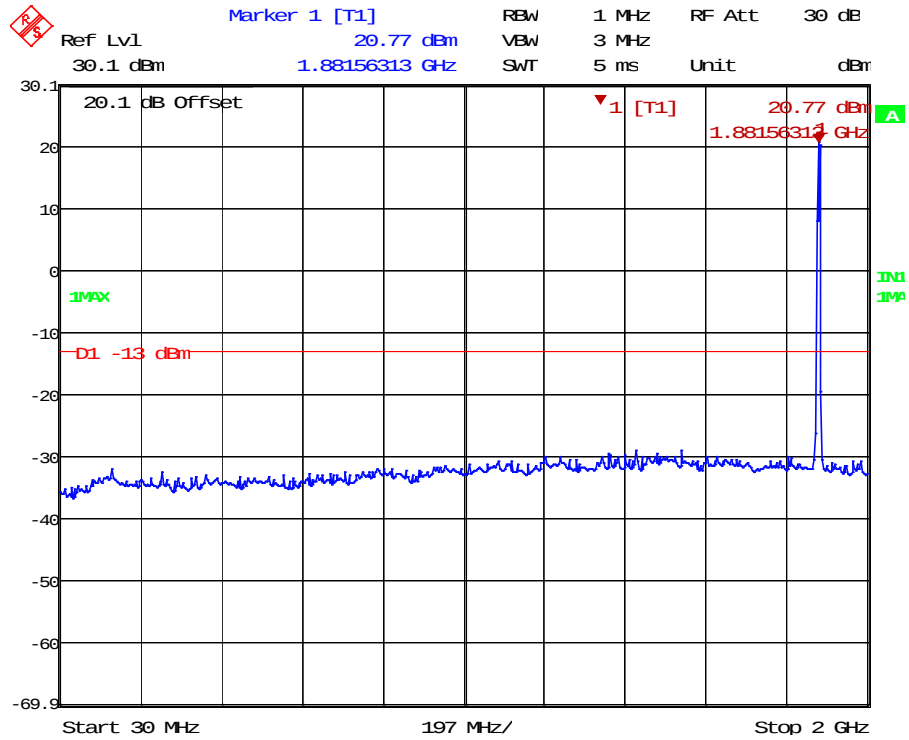


Date: 8.JAN.2014 14:55:15

WCDMA Band II - Low Channel

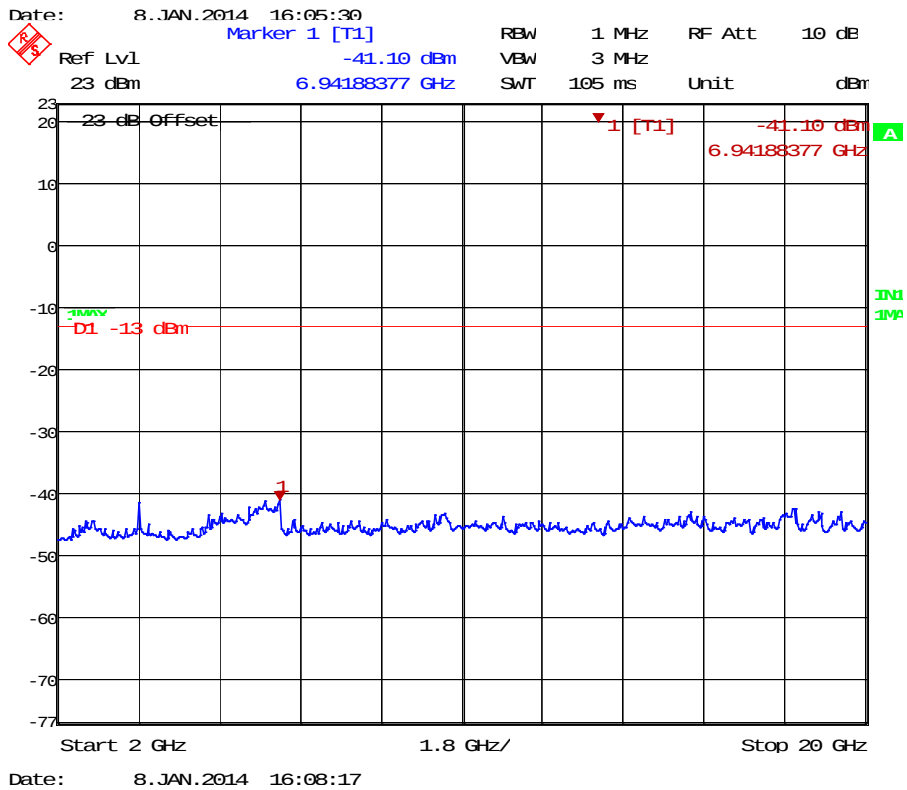
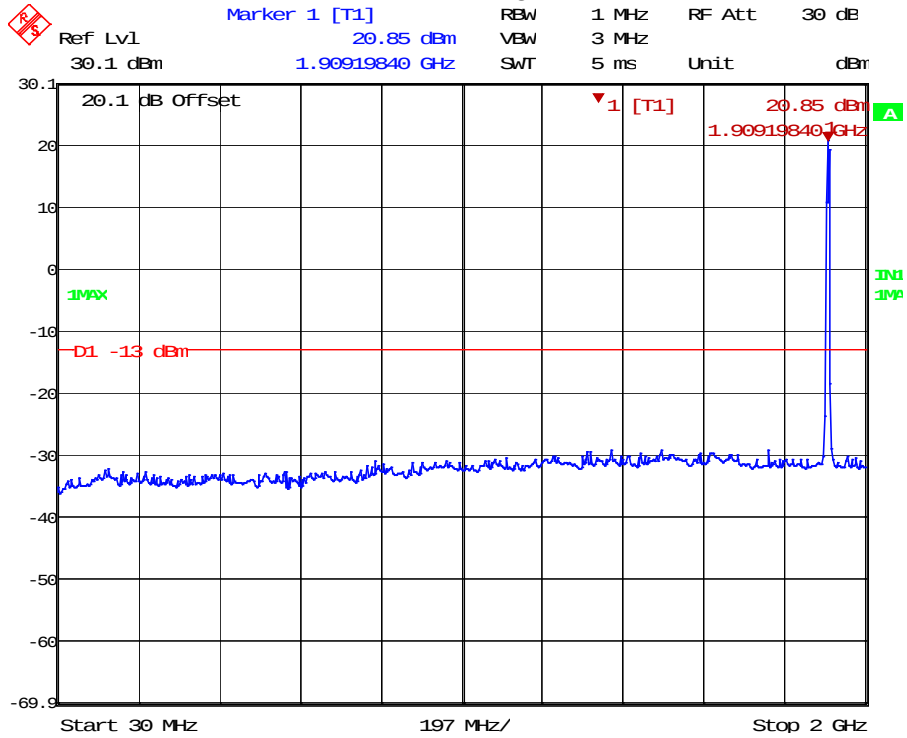


## WCDMA Band II - Mid Channel

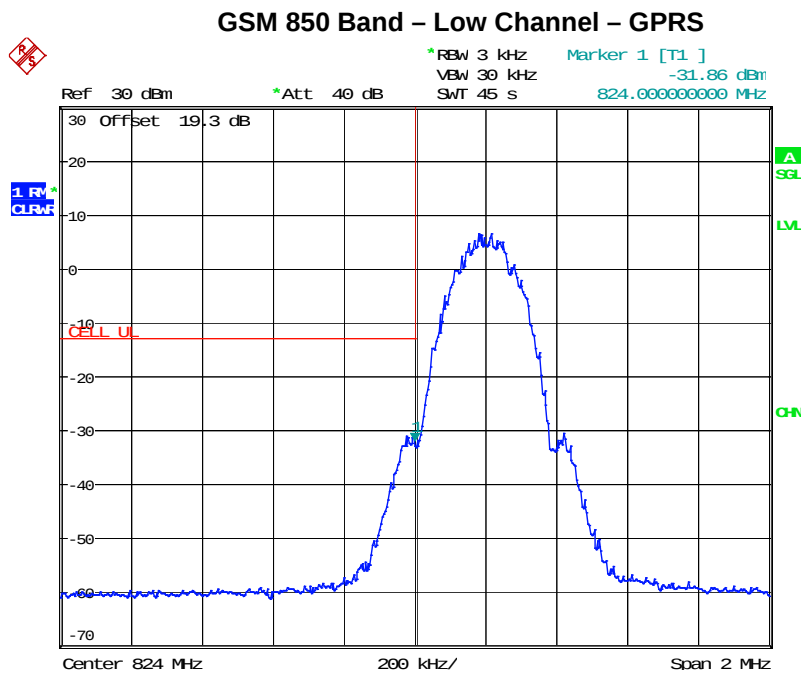


Date: 8..JAN.2014 16:09:32

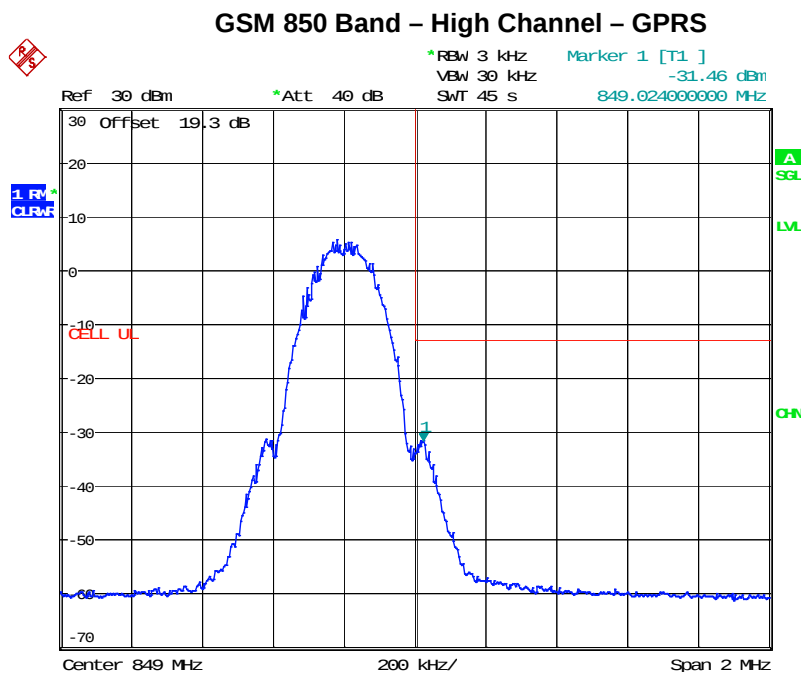
WCDMA Band II - High Channel



**Emissions within 1MHz of the band edge:**

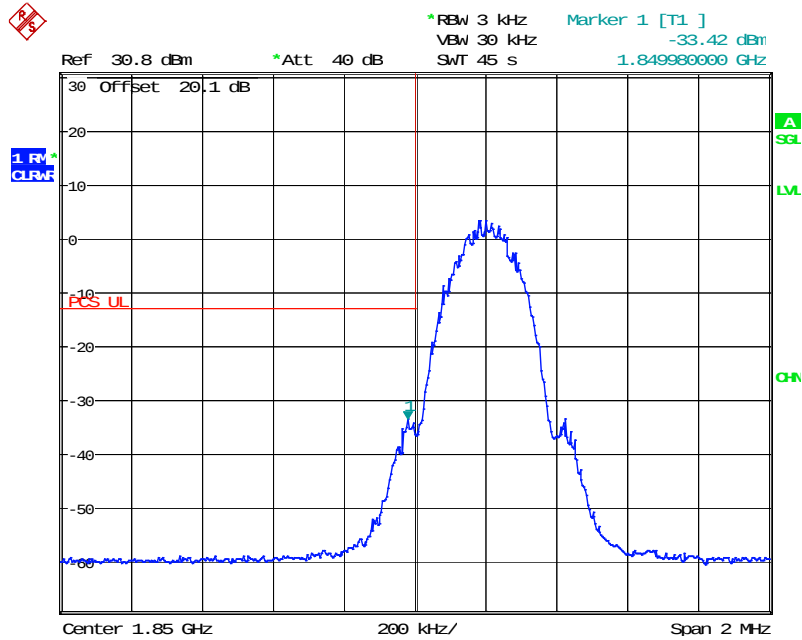


Date: 9.JAN.2014 14:02:12



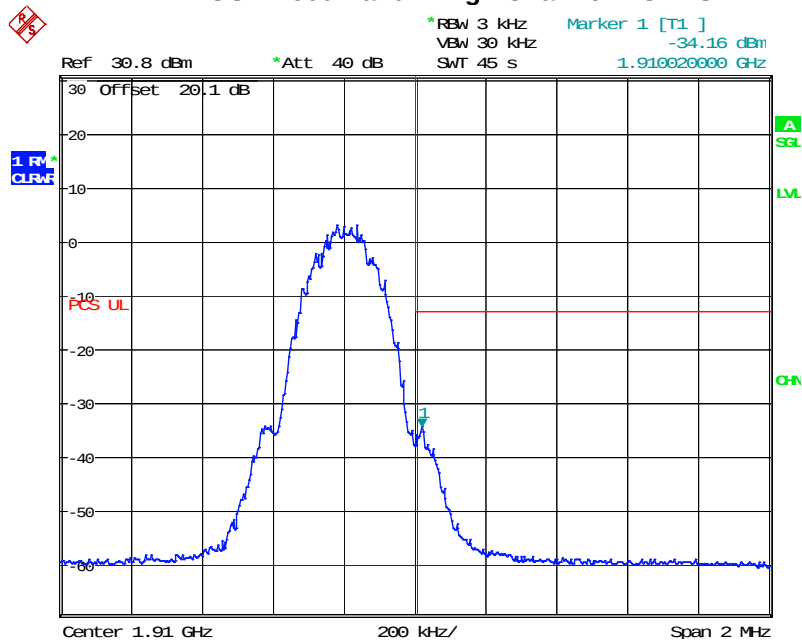
Date: 9.JAN.2014 14:03:32

### GSM 1900 Band – Low Channel - GPRS



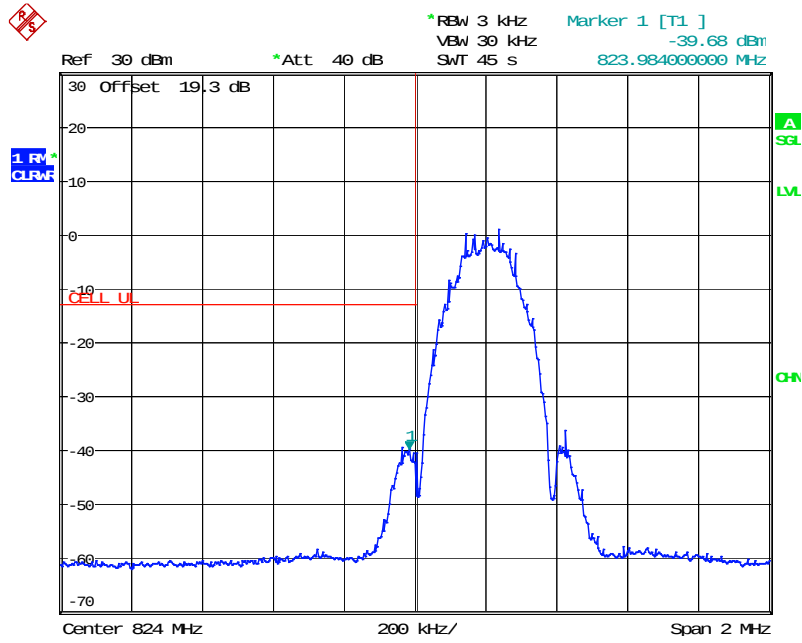
Date: 9.JAN.2014 14:57:23

### GSM 1900 Band – High Channel – GPRS



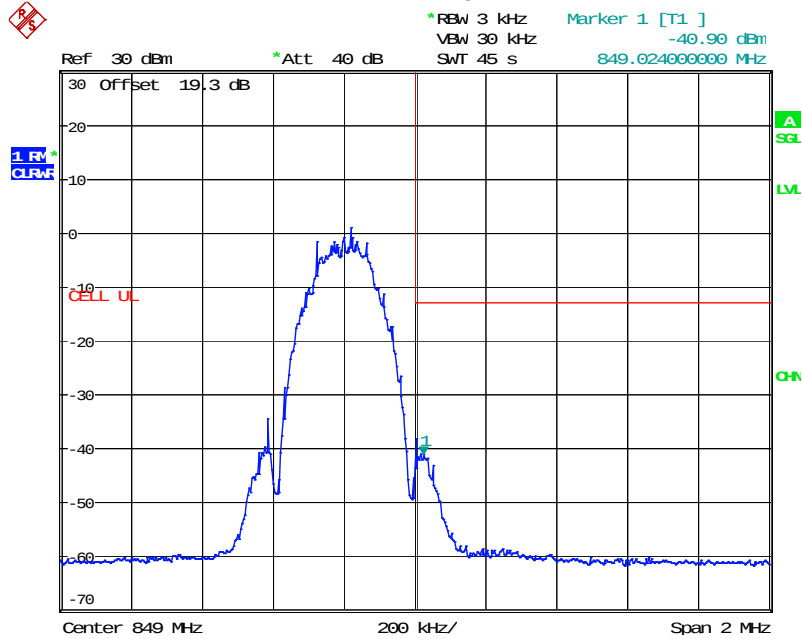
Date: 9.JAN.2014 14:58:51

GSM 850 Band – Low Channel – EDGE



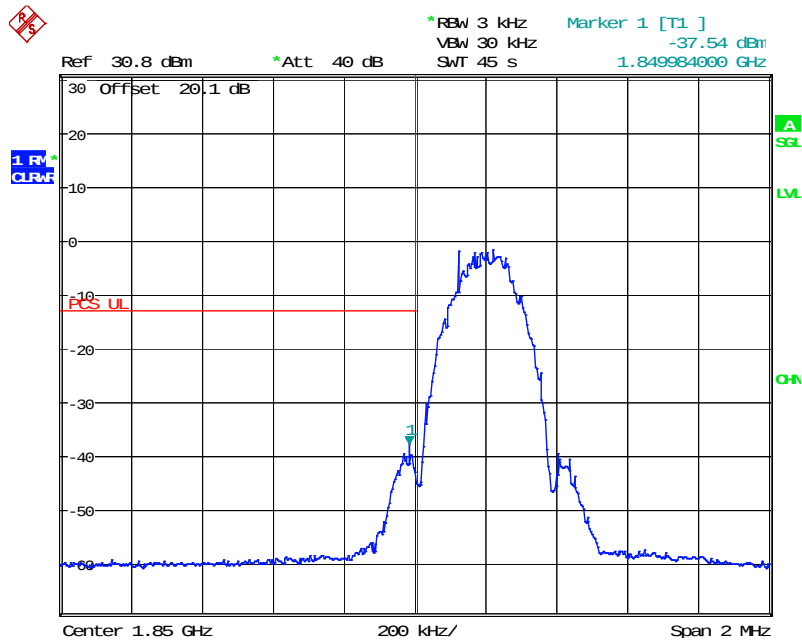
Date: 9.JAN.2014 14:07:49

GSM 850 Band – High Channel - EDGE



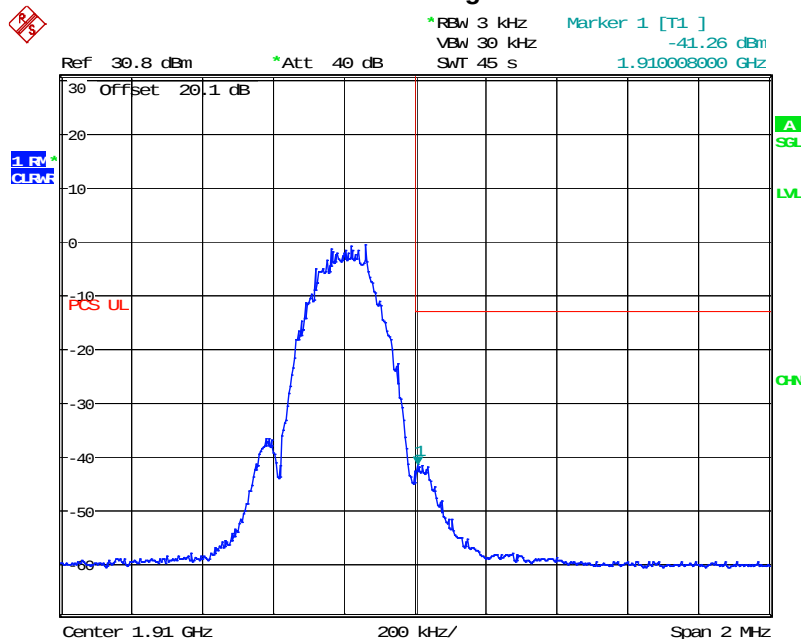
Date: 9.JAN.2014 14:05:22

### GSM 1900 Band – Low Channel - EDGE



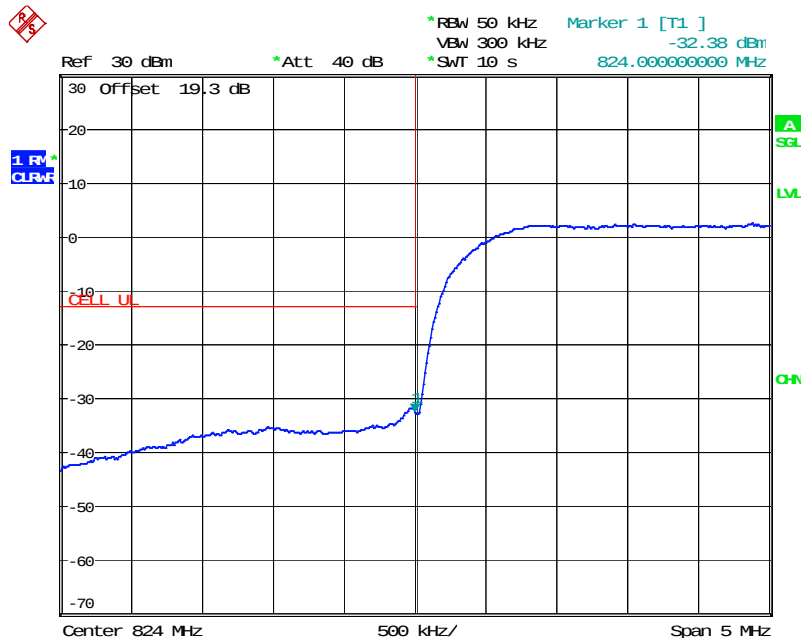
Date: 9.JAN.2014 15:01:09

### GSM 1900 Band – High Channel – EDGE



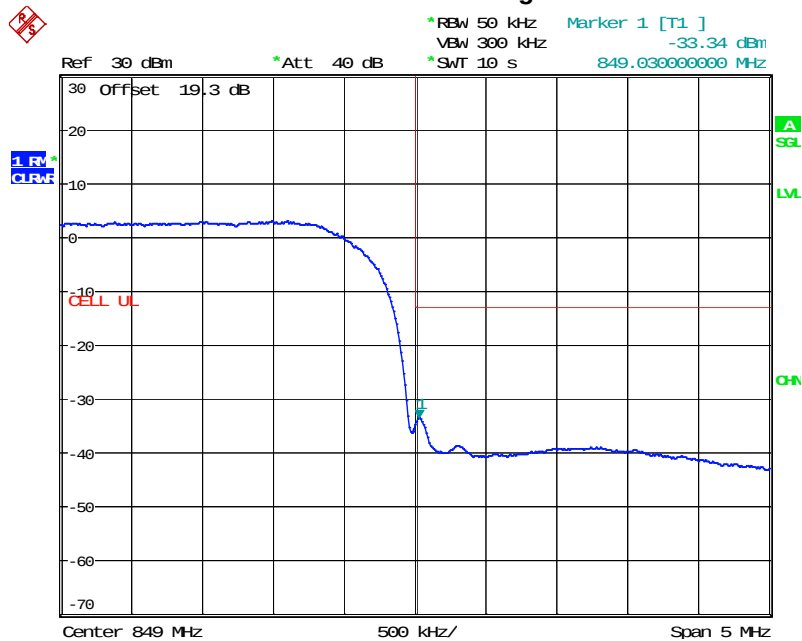
Date: 9.JAN.2014 15:00:05

### WCDMA Band V – Low Channel



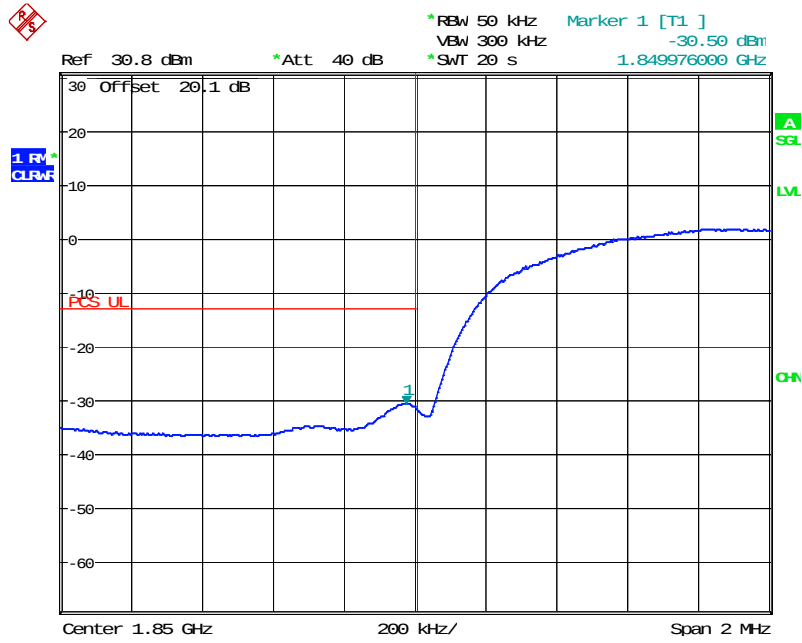
Date: 9.JAN.2014 14:12:44

### WCDMA Band V – High Channel



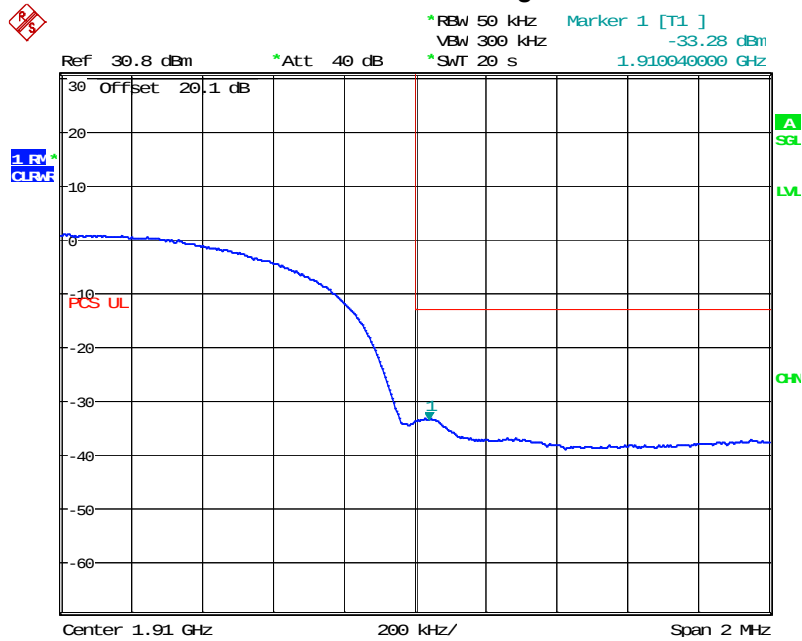
Date: 9.JAN.2014 14:13:55

### WCDMA Band II – Low Channel



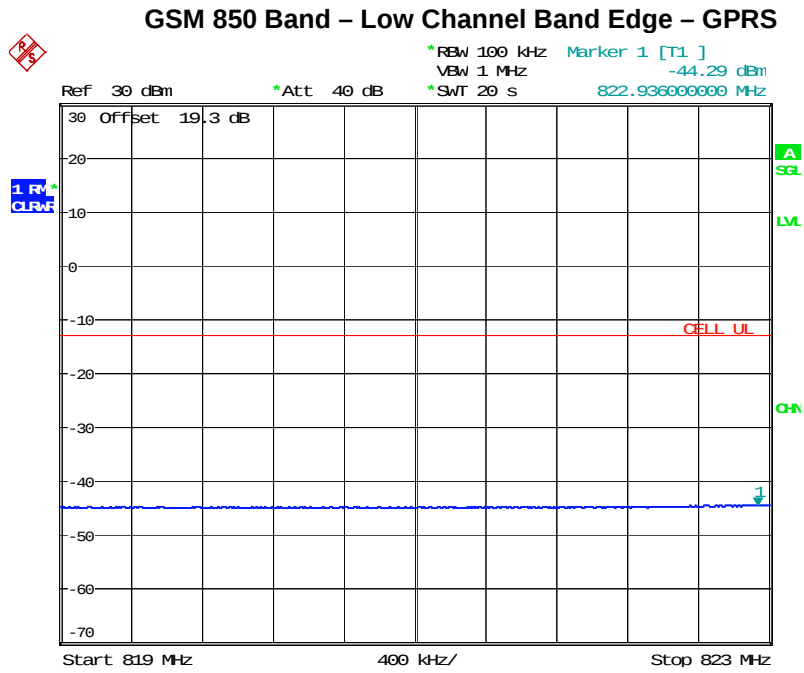
Date: 9.JAN.2014 15:09:20

### WCDMA Band II – High Channel

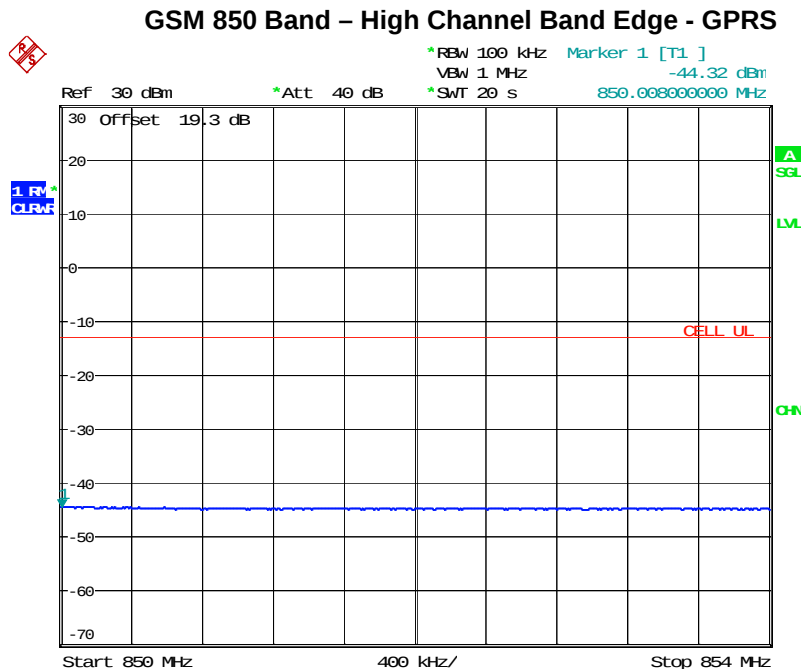


Date: 9.JAN.2014 15:10:25

**Emissions within 4MHz of the block edge:**

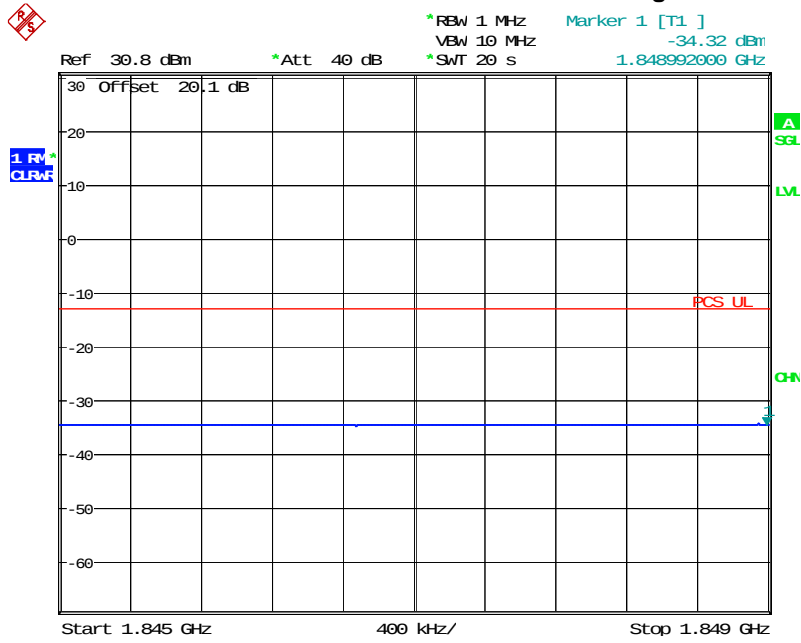


Date: 9.JAN.2014 14:51:46



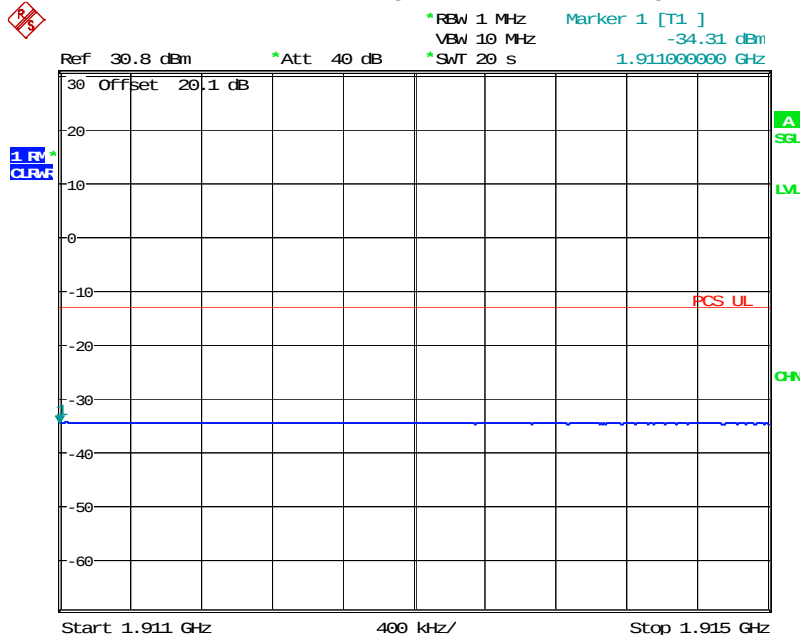
Date: 9.JAN.2014 14:48:38

GSM 1900 Band – Low Channel Band Edge - GPRS



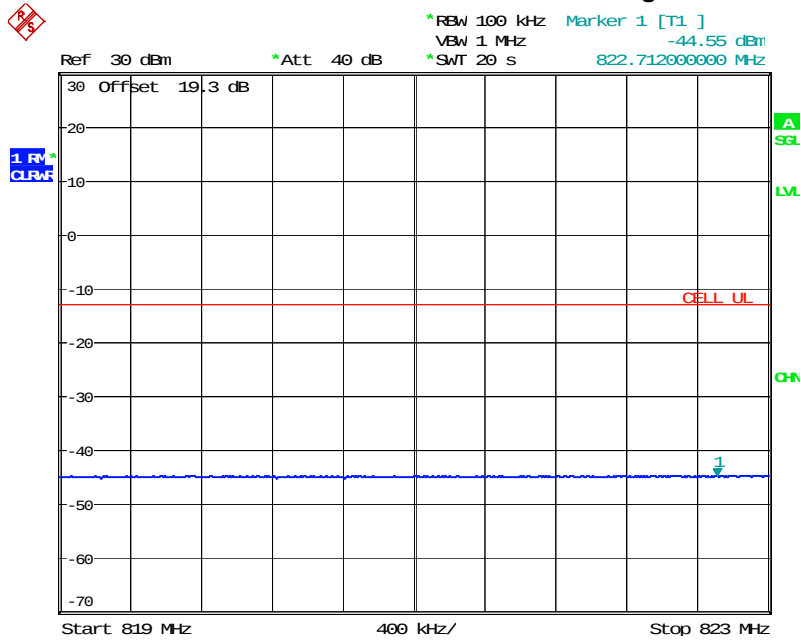
Date: 9.JAN.2014 15:19:47

GSM 1900 Band – High Channel Band Edge – GPRS



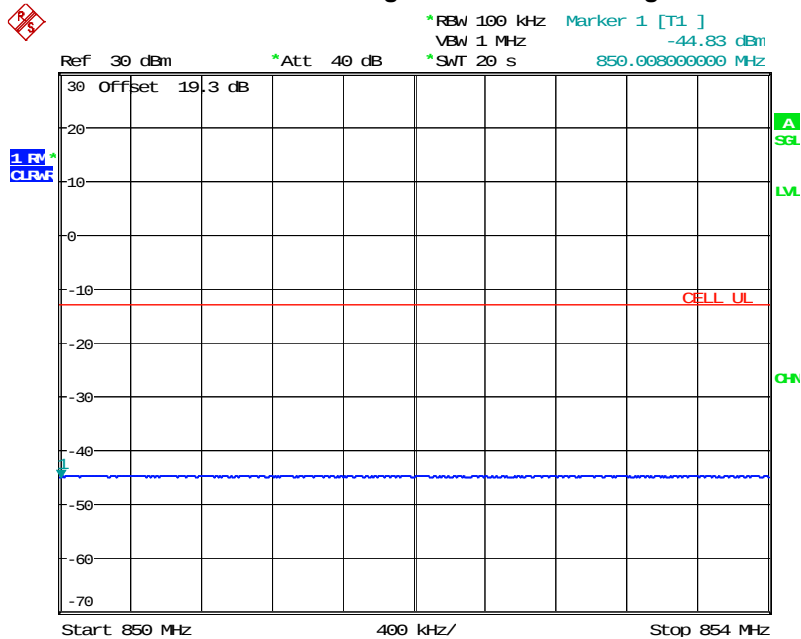
Date: 9.JAN.2014 15:21:07

### GSM 850 Band – Low Channel Band Edge – EDGE



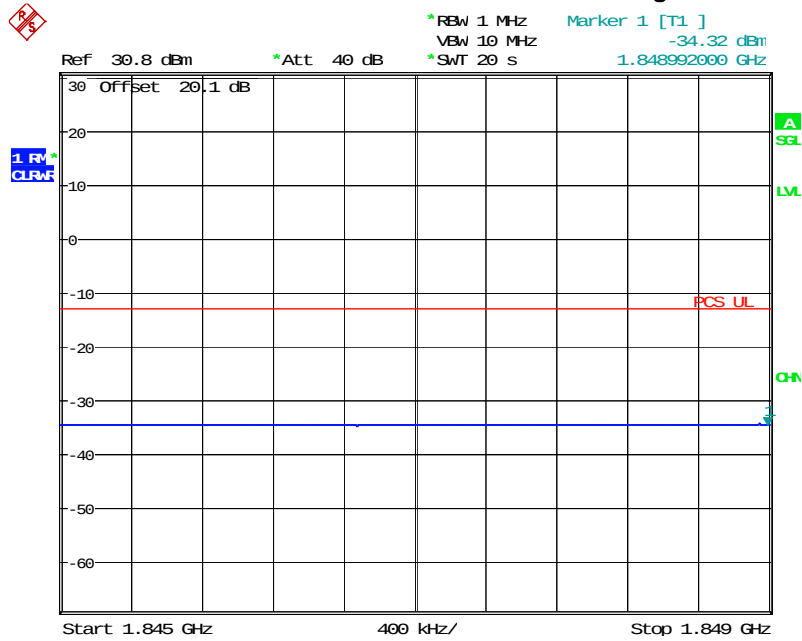
Date: 9.JAN.2014 14:50:50

### GSM 850 Band – High Channel Band Edge – EDGE



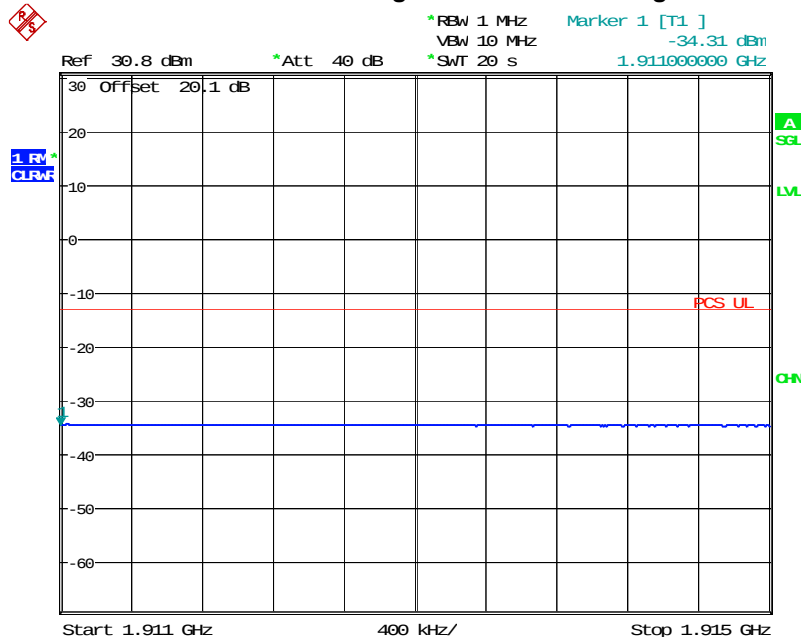
Date: 9.JAN.2014 14:49:43

GSM 1900 Band – Low Channel Band Edge - EDGE



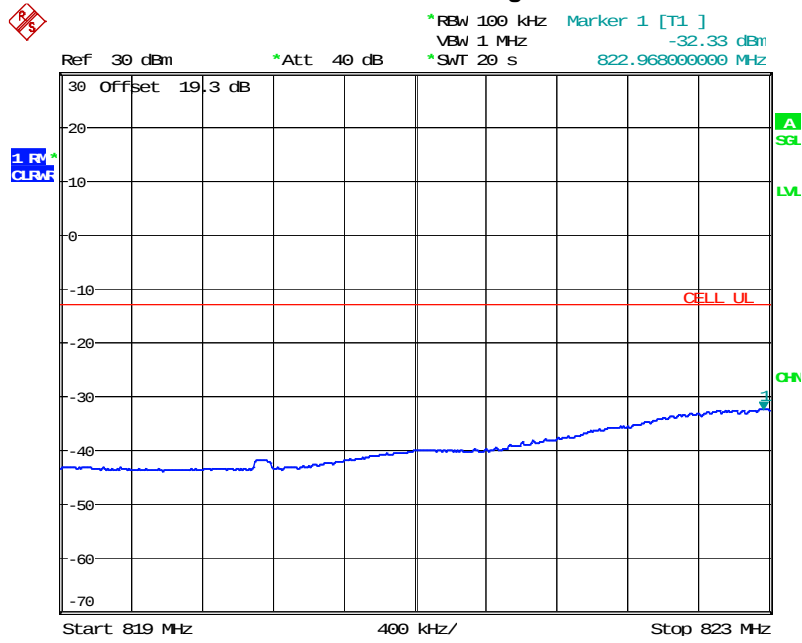
Date: 9.JAN.2014 15:19:47

GSM 1900 Band – High Channel Band Edge – EDGE



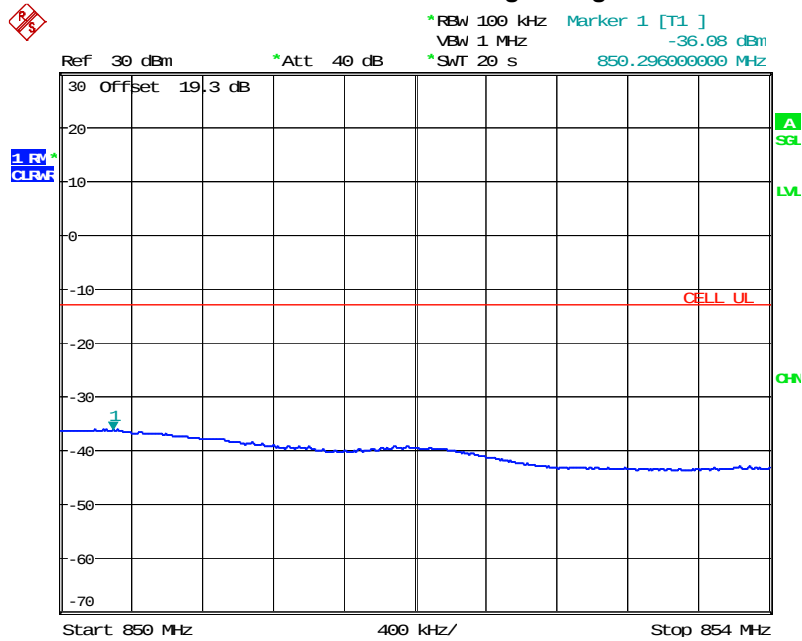
Date: 9.JAN.2014 15:21:07

### WCDMA Band V Band Edge – Low Channel



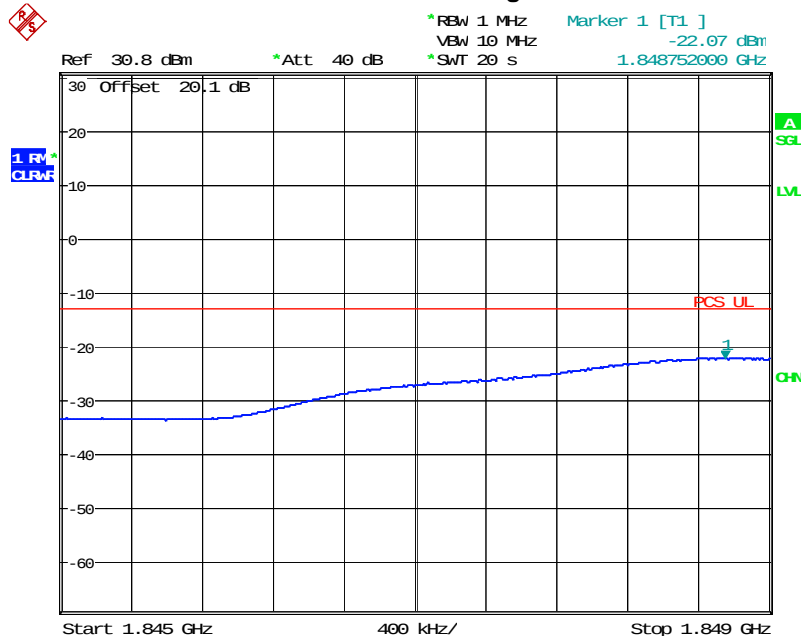
Date: 9.JAN.2014 14:42:52

### WCDMA Band V Band Edge – High Channel



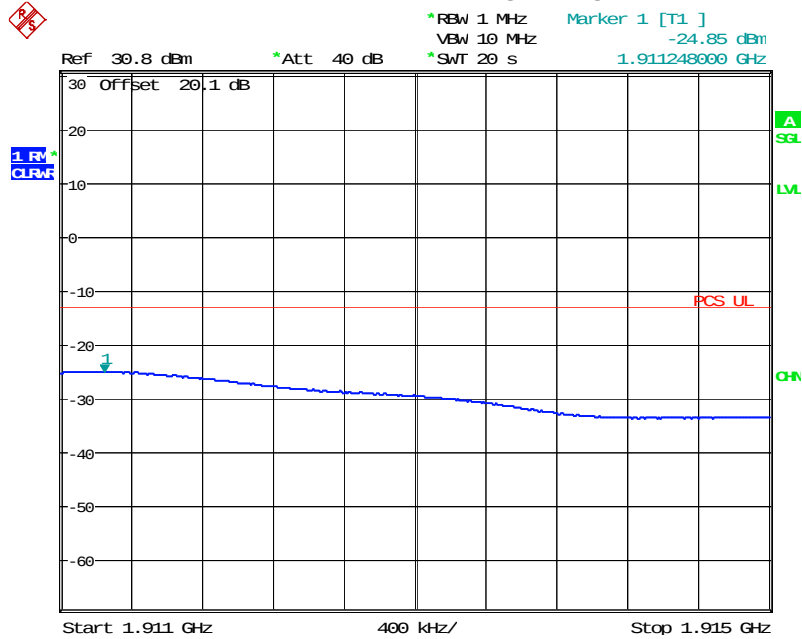
Date: 9.JAN.2014 14:45:47

### WCDMA Band II Band Edge – Low Channel



Date: 9.JAN.2014 15:15:19

### WCDMA Band II Band Edge – High Channel



Date: 9.JAN.2014 15:24:52

## 7 Radiated Output Power

### 7.1 Test Limits

#### § 22.913

(a) (2) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

#### § 24.232

(c) Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

### 7.2 Test Procedure

The radiated output power was determined by adding the peak antenna gain to the measured conducted output power to determine the peak radiated power.

$$ERP = ConductedOutputPower(dBm) + AntennaGain(dBi) - 2.15$$

$$EIRP = ConductedOutputPower(dBm) + AntennaGain(dBi)$$

### 7.3 Results:

The TCA203 meets the radiated power requirements of FCC §22.913 and §24.232.

| Radiated Output Power |         |                 |                       |                         |              |              |
|-----------------------|---------|-----------------|-----------------------|-------------------------|--------------|--------------|
| Band                  | Channel | Frequency (MHz) | Conducted Power (dBm) | Peak Antenna Gain (dBi) | EIRP (dBm)   | ERP(dBm)     |
| GSM 850 (GPRS)        | 128     | 824.2           | 32.19                 | 4.28                    | 36.47        | <b>34.32</b> |
|                       | 190     | 836.6           | 32.04                 | 4.28                    | 36.32        | 34.17        |
|                       | 251     | 848.8           | 31.77                 | 4.28                    | 36.05        | 33.90        |
| GSM 850 (EDGE)        | 128     | 824.2           | 26.47                 | 4.28                    | 30.75        | <b>28.60</b> |
|                       | 190     | 836.6           | 26.31                 | 4.28                    | 30.59        | 28.44        |
|                       | 251     | 848.8           | 26.09                 | 4.28                    | 30.37        | 28.22        |
| GSM 1900 (GPRS)       | 512     | 1850.2          | 28.37                 | 3.00                    | 31.37        | 29.22        |
|                       | 661     | 1880            | 28.58                 | 3.00                    | 31.58        | 29.43        |
|                       | 810     | 1909.8          | 28.72                 | 3.00                    | <b>31.72</b> | 29.57        |
| GSM 1900 (EDGE)       | 512     | 1850.2          | 25.28                 | 3.00                    | 28.28        | 26.13        |
|                       | 661     | 1880            | 25.32                 | 3.00                    | <b>28.32</b> | 26.17        |
|                       | 810     | 1909.8          | 25.3                  | 3.00                    | 28.30        | 26.15        |
| WCDMA Band V          | 4132    | 826.4           | 22.10                 | 4.28                    | 26.38        | 24.23        |
|                       | 4182    | 836.4           | 22.10                 | 4.28                    | 26.38        | <b>24.23</b> |
|                       | 4233    | 846.6           | 22.02                 | 4.28                    | 26.30        | 24.15        |
| WCDMA Band II         | 9262    | 1852.4          | 21.98                 | 3.00                    | <b>24.98</b> | 22.83        |
|                       | 9400    | 1880            | 21.95                 | 3.00                    | 24.95        | 22.80        |
|                       | 9538    | 1907.6          | 21.75                 | 3.00                    | 24.75        | 22.60        |

## 8 Radiated Spurious Emissions (Transmitter)

### 8.1 Test Limits

#### § 2.1053

- (a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.

#### § 22.917

- (a) Out of band emissions. 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.
- (b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth ( i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

#### § 24.238

- (a) Out of band emissions. 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.
- (b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth ( i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

## 8.2 Test Procedure

The EUT was placed on a non-conductive turntable. The measurement antenna was placed at a distance of 3 meters from the EUT. The EUT was forced to transmit at its maximum output power setting. During the tests, the antenna height and EUT azimuth were varied in order to identify the maximum level of emissions from the EUT.

The frequency range up to tenth harmonic was investigated in order to identify the spurious emission. Once the spurious emissions were identified, the power of the emission was determined using the substitution method described in TIA-603-C. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and at the spurious emissions frequency.

## 8.3 Test Equipment Used:

| Description            | Serial Number | Manufacturer     | Model    | Cal. Date                | Cal. Due                 |
|------------------------|---------------|------------------|----------|--------------------------|--------------------------|
| EMI Test Receiver      | 1302.6005.40  | Rohde & Schwarz  | ESU40    | 9/11/2013                | 9/11/2014                |
| Preamplifier           | 122005        | Rohde&Schwarz    | TS-PR18  | 9/19/2013                | 9/19/2014                |
| Biconnilog Antenna     | 00051864      | ETS              | 3142C    | 12/17/2013               | 12/17/2014               |
| Horn Antenna           | 1096          | Antenna Research | DRG118A  | 4/24/2013                | 4/24/2014                |
| Horn Antenna           | 6556          | ETS              | 3115     | 4/24/2013                | 4/24/2014                |
| System Controller      | 121701-1      | Sunol Sciences   | SC99V    | Calibration Not Required | Calibration Not Required |
| Base Station Simulator | 3917          | Rohde&Schwarz    | CMW500   | 9/26/2013                | 9/26/2014                |
| Signal Generator       | 3782          | Rohde&Schwarz    | SMB100A  | 9/12/2013                | 9/12/2014                |
| High Pass Filter       | 013           | Micro-Tronics    | HPM50108 | Time Of Use              | Time Of Use              |
| Band Reject Filter     | 109           | Micro-Tronics    | BRM50707 | Time Of Use              | Time Of Use              |
| Environmental Chamber  | 3947          | Test Equity      | 115A     | Time Of Use              | Time Of Use              |
| Multimeter/Temp Meter  | 3400          | Fluke            | 289      | 5/29/2013                | 5/29/2014                |

## 8.4 Results:

All radiated spurious emissions were attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB which is equivalent to -13dBm. The emissions were measured using an RMS detector and the analyzer was gated so that the emission was only measured during the on-times of the transmitter.

**Worst Case Spurious Measurements – GSM 850 Bands – GPRS Mode**

| Radiated Spurious Emissions Measurement                                             |                          |          |                      |                              |                 |                       |             |                                        |
|-------------------------------------------------------------------------------------|--------------------------|----------|----------------------|------------------------------|-----------------|-----------------------|-------------|----------------------------------------|
| Test Engineer: Jason Centers                                                        |                          |          |                      |                              |                 |                       |             |                                        |
| Test Date: 12/26/2013                                                               |                          |          |                      |                              |                 |                       |             |                                        |
| Temp. / Humidity / Pressure: 24.2C/20.1%/996.6mbar                                  |                          |          |                      |                              |                 |                       |             |                                        |
| Bandwidth Settings: RBW = VBW = 1MHz                                                |                          |          |                      |                              |                 |                       |             |                                        |
| Notes: Spurious emissions not reported here were below the measurement noise floor. |                          |          |                      |                              |                 |                       |             |                                        |
|                                                                                     |                          |          | A                    | B                            | C               | D                     | E           | F                                      |
| Band/Channel                                                                        | Spurious Frequency (MHz) | Polarity | Device Reading (dBm) | Signal Generator Level (dBm) | Cable Loss (dB) | Tx Antenna Gain (dBd) | Limit (dBm) | Radiated Spurious Emission Level (dBm) |
| GSM 850/Channel 128                                                                 | 1648.4                   | H        | -53.46               | -51.65                       | 2.84            | 6.70                  | -13         | -47.78                                 |
|                                                                                     | 1648.4                   | V        | -55.85               | -52.83                       | 2.84            | 6.70                  | -13         | -48.96                                 |
|                                                                                     | 2472.6                   | H        | -47.56               | -40.57                       | 3.78            | 7.16                  | -13         | -37.19                                 |
|                                                                                     | 2472.6                   | V        | -52.86               | -44.1                        | 3.78            | 7.16                  | -13         | -40.72                                 |
|                                                                                     | 3296.8                   | H        | -67.61               | -58.91                       | 4.42            | 7.14                  | -13         | -56.19                                 |
|                                                                                     | 3296.8                   | V        | -66.63               | -56.87                       | 4.42            | 7.14                  | -13         | -54.15                                 |
|                                                                                     | 4121                     | H        | -63.29               | -52.36                       | 5.31            | 8.15                  | -13         | -49.53                                 |
|                                                                                     | 4121                     | V        | -65.13               | -54.22                       | 5.31            | 8.15                  | -13         | -51.39                                 |
|                                                                                     | 4945.2                   | H        | -64.27               | -50.11                       | 6.24            | 8.80                  | -13         | -47.55                                 |
|                                                                                     | 4945.2                   | V        | -65.91               | -52.46                       | 6.24            | 8.80                  | -13         | -49.90                                 |
|                                                                                     | 5769.4                   | H        | -68.66               | -52.97                       | 6.55            | 9.27                  | -13         | -50.25                                 |
|                                                                                     | 5769.4                   | V        | -72.09               | -57.58                       | 6.55            | 9.27                  | -13         | -54.86                                 |
|                                                                                     | 6593.6                   | H        | -63.93               | -46.9                        | 7.10            | 9.96                  | -13         | -44.03                                 |
|                                                                                     | 6593.6                   | V        | -69.14               | -52.76                       | 7.10            | 9.96                  | -13         | -49.89                                 |
|                                                                                     | 7417.8                   | H        | -65.67               | -47.62                       | 7.71            | 8.72                  | -13         | -46.61                                 |
|                                                                                     | 7417.8                   | V        | -67.06               | -49.87                       | 7.71            | 8.72                  | -13         | -48.86                                 |
| GSM 850/Channel 192                                                                 | 8242                     | H        | -74.57               | -54.65                       | 8.25            | 9.16                  | -13         | -53.74                                 |
|                                                                                     | 8242                     | V        | -74.92               | -56.06                       | 8.25            | 9.16                  | -13         | -55.15                                 |
|                                                                                     | 1674                     | H        | -51.49               | -48.83                       | 2.93            | 6.70                  | -13         | -45.06                                 |
|                                                                                     | 1674                     | V        | -54.45               | -50.67                       | 2.93            | 6.70                  | -13         | -46.90                                 |
|                                                                                     | 2511                     | H        | -49.87               | -42.8                        | 3.69            | 7.43                  | -13         | -39.06                                 |
|                                                                                     | 2511                     | V        | -49.43               | -40.63                       | 3.69            | 7.43                  | -13         | -36.89                                 |
|                                                                                     | 3348                     | H        | -59.99               | -51.53                       | 4.53            | 7.19                  | -13         | -48.88                                 |
|                                                                                     | 3348                     | V        | -62.45               | -52.98                       | 4.53            | 7.19                  | -13         | -50.33                                 |
|                                                                                     | 4185                     | H        | -58.86               | -47.46                       | 5.36            | 8.15                  | -13         | -44.67                                 |
|                                                                                     | 4185                     | V        | -66.73               | -55.82                       | 5.36            | 8.15                  | -13         | -53.03                                 |
|                                                                                     | 5022                     | H        | -62.44               | -47.78                       | 6.54            | 8.87                  | -13         | -45.46                                 |
|                                                                                     | 5022                     | V        | -65.53               | -51.9                        | 6.54            | 8.87                  | -13         | -49.58                                 |
|                                                                                     | 5859                     | H        | -65.23               | -49.03                       | 6.76            | 9.57                  | -13         | -46.22                                 |
|                                                                                     | 5859                     | V        | -66.37               | -50.91                       | 6.76            | 9.57                  | -13         | -48.10                                 |
|                                                                                     | 6696                     | H        | -62.88               | -44.93                       | 7.23            | 9.81                  | -13         | -42.35                                 |
|                                                                                     | 6696                     | V        | -69.28               | -52.02                       | 7.23            | 9.81                  | -13         | -49.44                                 |
| GSM 850/Channel 251                                                                 | 7533                     | H        | -66.06               | -47.59                       | 7.62            | 9.02                  | -13         | -46.19                                 |
|                                                                                     | 7533                     | V        | -69.82               | -52.54                       | 7.62            | 9.02                  | -13         | -51.14                                 |
|                                                                                     | 8370                     | H        | -66.35               | -46.88                       | 8.27            | 9.22                  | -13         | -45.93                                 |
|                                                                                     | 8370                     | V        | -69.54               | -50.96                       | 8.27            | 9.22                  | -13         | -50.01                                 |
|                                                                                     | 1697.6                   | H        | -47.26               | -44.32                       | 2.95            | 6.70                  | -13         | -40.57                                 |
|                                                                                     | 1697.6                   | V        | -51.76               | -47.44                       | 2.95            | 6.70                  | -13         | -43.69                                 |
|                                                                                     | 2546.4                   | H        | -42.39               | -34.98                       | 3.75            | 7.43                  | -13         | -31.31                                 |
|                                                                                     | 2546.4                   | V        | -45.02               | -35.67                       | 3.75            | 7.43                  | -13         | -32.00                                 |
|                                                                                     | 3395.2                   | H        | -61.23               | -52.32                       | 4.54            | 7.19                  | -13         | -49.68                                 |
|                                                                                     | 3395.2                   | V        | -65.51               | -55.89                       | 4.54            | 7.19                  | -13         | -53.25                                 |
|                                                                                     | 4244                     | H        | -66.59               | -55.29                       | 5.48            | 8.37                  | -13         | -52.41                                 |
|                                                                                     | 4244                     | V        | -70.26               | -59.57                       | 5.48            | 8.37                  | -13         | -56.69                                 |
|                                                                                     | 5092.8                   | H        | -59.7                | -45.4                        | 6.56            | 8.87                  | -13         | -43.10                                 |
|                                                                                     | 5092.8                   | V        | -63.78               | -50.47                       | 6.56            | 8.87                  | -13         | -48.17                                 |
|                                                                                     | 5941.6                   | H        | -65.67               | -49.12                       | 6.85            | 9.53                  | -13         | -46.44                                 |
|                                                                                     | 5941.6                   | V        | -67.34               | -51.52                       | 6.85            | 9.53                  | -13         | -48.84                                 |
|                                                                                     | 6790.4                   | H        | -62.7                | -44.45                       | 7.43            | 9.55                  | -13         | -42.33                                 |
|                                                                                     | 6790.4                   | V        | -67.91               | -50.84                       | 7.43            | 9.55                  | -13         | -48.72                                 |
|                                                                                     | 7639.2                   | H        | -66.93               | -48.55                       | 7.43            | 9.20                  | -13         | -46.78                                 |
|                                                                                     | 7639.2                   | V        | -71.16               | -54.01                       | 7.43            | 9.20                  | -13         | -52.24                                 |
|                                                                                     | 8488                     | H        | -74.23               | -54.64                       | 8.36            | 9.13                  | -13         | -53.87                                 |
|                                                                                     | 8488                     | V        | -75.47               | -56.84                       | 8.36            | 9.13                  | -13         | -56.07                                 |
|                                                                                     |                          |          |                      |                              |                 |                       |             | F=B-C+D                                |

Worst Case Spurious Measurements – GSM 850 Band – EDGE Mode

| Radiated Spurious Emissions Measurement                                             |                          |          |                      |                              |                 |                       |             |                                        |
|-------------------------------------------------------------------------------------|--------------------------|----------|----------------------|------------------------------|-----------------|-----------------------|-------------|----------------------------------------|
| Test Engineer: Jason Centers                                                        |                          |          |                      |                              |                 |                       |             |                                        |
| Test Date: 12/26/2013                                                               |                          |          |                      |                              |                 |                       |             |                                        |
| Temp. / Humidity / Pressure: 24.2C/20.1%/996.6mbar                                  |                          |          |                      |                              |                 |                       |             |                                        |
| Bandwidth Settings: RBW = VBW = 1MHz                                                |                          |          |                      |                              |                 |                       |             |                                        |
| Notes: Spurious emissions not reported here were below the measurement noise floor. |                          |          |                      |                              |                 |                       |             |                                        |
|                                                                                     |                          |          | A                    | B                            | C               | D                     | E           | F                                      |
| Band/Channel                                                                        | Spurious Frequency (MHz) | Polarity | Device Reading (dBm) | Signal Generator Level (dBm) | Cable Loss (dB) | Tx Antenna Gain (dBd) | Limit (dBm) | Radiated Spurious Emission Level (dBm) |
| GSM 850/Channel 128                                                                 | 1648.4                   | H        | -55.4                | -53.59                       | 2.84            | 6.70                  | -13         | -49.72                                 |
|                                                                                     | 1648.4                   | V        | -52.16               | -49.14                       | 2.84            | 6.70                  | -13         | -45.27                                 |
|                                                                                     | 2472.6                   | H        | -50.08               | -43.09                       | 3.78            | 7.16                  | -13         | -39.71                                 |
|                                                                                     | 2472.6                   | V        | -57.89               | -49.13                       | 3.78            | 7.16                  | -13         | -45.75                                 |
|                                                                                     | 3296.8                   | H        | -74.66               | -65.96                       | 4.42            | 7.14                  | -13         | -63.24                                 |
|                                                                                     | 3296.8                   | V        | -74.31               | -64.55                       | 4.42            | 7.14                  | -13         | -61.83                                 |
|                                                                                     | 4121                     | H        | -64.15               | -53.22                       | 5.31            | 8.15                  | -13         | -50.39                                 |
|                                                                                     | 4121                     | V        | -69.41               | -58.5                        | 5.31            | 8.15                  | -13         | -55.67                                 |
|                                                                                     | 4945.2                   | H        | -64.94               | -50.78                       | 6.24            | 8.80                  | -13         | -48.22                                 |
|                                                                                     | 4945.2                   | V        | -68.35               | -54.9                        | 6.24            | 8.80                  | -13         | -52.34                                 |
|                                                                                     | 5769.4                   | H        | -68.71               | -53.02                       | 6.55            | 9.27                  | -13         | -50.30                                 |
|                                                                                     | 5769.4                   | V        | -71.72               | -57.21                       | 6.55            | 9.27                  | -13         | -54.49                                 |
|                                                                                     | 6593.6                   | H        | -67.78               | -50.75                       | 7.10            | 9.96                  | -13         | -47.88                                 |
|                                                                                     | 6593.6                   | V        | -71.04               | -54.66                       | 7.10            | 9.96                  | -13         | -51.79                                 |
|                                                                                     | 7417.8                   | H        | -67.1                | -49.05                       | 7.71            | 8.72                  | -13         | -48.04                                 |
|                                                                                     | 7417.8                   | V        | -68.89               | -51.7                        | 7.71            | 8.72                  | -13         | -50.69                                 |
| GSM 850/Channel 192                                                                 | 8242                     | H        | -73.97               | -54.05                       | 8.25            | 9.16                  | -13         | -53.14                                 |
|                                                                                     | 8242                     | V        | -75.38               | -56.52                       | 8.25            | 9.16                  | -13         | -55.61                                 |
|                                                                                     | 1674                     | H        | -55.25               | -52.59                       | 2.93            | 6.70                  | -13         | -48.82                                 |
|                                                                                     | 1674                     | V        | -52.79               | -49.01                       | 2.93            | 6.70                  | -13         | -45.24                                 |
|                                                                                     | 2511                     | H        | -48.23               | -41.16                       | 3.69            | 7.43                  | -13         | -37.42                                 |
|                                                                                     | 2511                     | V        | -53.55               | -44.75                       | 3.69            | 7.43                  | -13         | -41.01                                 |
|                                                                                     | 3348                     | H        | -64.12               | -55.66                       | 4.53            | 7.19                  | -13         | -53.01                                 |
|                                                                                     | 3348                     | V        | -64.45               | -54.98                       | 4.53            | 7.19                  | -13         | -52.33                                 |
|                                                                                     | 4185                     | H        | -66.33               | -54.93                       | 5.36            | 8.15                  | -13         | -52.14                                 |
|                                                                                     | 4185                     | V        | -67.31               | -56.4                        | 5.36            | 8.15                  | -13         | -53.61                                 |
|                                                                                     | 5022                     | H        | -64.01               | -49.35                       | 6.54            | 8.87                  | -13         | -47.03                                 |
|                                                                                     | 5022                     | V        | -65.13               | -51.5                        | 6.54            | 8.87                  | -13         | -49.18                                 |
|                                                                                     | 5859                     | H        | -66.68               | -50.48                       | 6.76            | 9.57                  | -13         | -47.67                                 |
|                                                                                     | 5859                     | V        | -68.61               | -53.15                       | 6.76            | 9.57                  | -13         | -50.34                                 |
|                                                                                     | 6696                     | H        | -68.08               | -50.13                       | 7.23            | 9.81                  | -13         | -47.55                                 |
|                                                                                     | 6696                     | V        | -67.08               | -49.82                       | 7.23            | 9.81                  | -13         | -47.24                                 |
| GSM 850/Channel 251                                                                 | 7533                     | H        | -67.39               | -48.92                       | 7.62            | 9.02                  | -13         | -47.52                                 |
|                                                                                     | 7533                     | V        | -71.23               | -53.95                       | 7.62            | 9.02                  | -13         | -52.55                                 |
|                                                                                     | 8370                     | H        | -75.53               | -56.06                       | 8.27            | 9.22                  | -13         | -55.11                                 |
|                                                                                     | 8370                     | V        | -75.47               | -56.89                       | 8.27            | 9.22                  | -13         | -55.94                                 |
|                                                                                     | 1697.6                   | H        | -50.18               | -47.24                       | 2.95            | 6.70                  | -13         | -43.49                                 |
|                                                                                     | 1697.6                   | V        | -54.91               | -50.59                       | 2.95            | 6.70                  | -13         | -46.84                                 |
|                                                                                     | 2546.4                   | H        | -45.58               | -38.17                       | 3.75            | 7.43                  | -13         | -34.50                                 |
|                                                                                     | 2546.4                   | V        | -48.92               | -39.57                       | 3.75            | 7.43                  | -13         | -35.90                                 |
|                                                                                     | 3395.2                   | H        | -65.01               | -56.1                        | 4.54            | 7.19                  | -13         | -53.46                                 |
|                                                                                     | 3395.2                   | V        | -64.21               | -54.59                       | 4.54            | 7.19                  | -13         | -51.95                                 |
|                                                                                     | 4244                     | H        | -67.38               | -56.08                       | 5.48            | 8.37                  | -13         | -53.20                                 |
|                                                                                     | 4244                     | V        | -68.57               | -57.88                       | 5.48            | 8.37                  | -13         | -55.00                                 |
|                                                                                     | 5092.8                   | H        | -59.43               | -45.13                       | 6.56            | 8.87                  | -13         | -42.83                                 |
|                                                                                     | 5092.8                   | V        | -64.33               | -51.02                       | 6.56            | 8.87                  | -13         | -48.72                                 |
|                                                                                     | 5941.6                   | H        | -68.44               | -51.89                       | 6.85            | 9.53                  | -13         | -49.21                                 |
|                                                                                     | 5941.6                   | V        | -68.17               | -52.35                       | 6.85            | 9.53                  | -13         | -49.67                                 |
|                                                                                     | 6790.4                   | H        | -67.07               | -48.82                       | 7.43            | 9.55                  | -13         | -46.70                                 |
|                                                                                     | 6790.4                   | V        | -69.73               | -52.66                       | 7.43            | 9.55                  | -13         | -50.54                                 |
|                                                                                     | 7639.2                   | H        | -70.12               | -51.74                       | 7.43            | 9.20                  | -13         | -49.97                                 |
|                                                                                     | 7639.2                   | V        | -72.22               | -55.07                       | 7.43            | 9.20                  | -13         | -53.30                                 |
|                                                                                     | 8488                     | H        | -74.55               | -54.96                       | 8.36            | 9.13                  | -13         | -54.19                                 |
|                                                                                     | 8488                     | V        | -74.52               | -55.89                       | 8.36            | 9.13                  | -13         | -55.12                                 |
|                                                                                     |                          |          |                      |                              |                 |                       |             | F=B-C+D                                |

**Worst Case Spurious Measurements – GSM 1900 Band – GPRS Mode**

| Radiated Spurious Emissions Measurement                                             |                          |          |                      |                              |                 |                       |             |                                        |
|-------------------------------------------------------------------------------------|--------------------------|----------|----------------------|------------------------------|-----------------|-----------------------|-------------|----------------------------------------|
| Test Engineer: Jason Centers                                                        |                          |          |                      |                              |                 |                       |             |                                        |
| Test Date: 12/27/2013                                                               |                          |          |                      |                              |                 |                       |             |                                        |
| Temp. / Humidity / Pressure: 22.9C/20.7%/997.1mbar                                  |                          |          |                      |                              |                 |                       |             |                                        |
| Bandwidth Settings: RBW = VBW = 1MHz                                                |                          |          |                      |                              |                 |                       |             |                                        |
| Notes: Spurious emissions not reported here were below the measurement noise floor. |                          |          |                      |                              |                 |                       |             |                                        |
|                                                                                     |                          |          | A                    | B                            | C               | D                     | E           | F                                      |
| Band/Channel                                                                        | Spurious Frequency (MHz) | Polarity | Device Reading (dBm) | Signal Generator Level (dBm) | Cable Loss (dB) | Tx Antenna Gain (dBd) | Limit (dBm) | Radiated Spurious Emission Level (dBm) |
| GSM 1900/Channel 512                                                                | 3700.4                   | H        | -45.83               | -35.36                       | 4.92            | 7.07                  | -13         | -33.21                                 |
|                                                                                     | 3700.4                   | V        | -49.01               | -36.7                        | 4.92            | 7.07                  | -13         | -34.55                                 |
|                                                                                     | 5550.6                   | H        | -49.37               | -35.03                       | 6.46            | 8.48                  | -13         | -33.01                                 |
|                                                                                     | 5550.6                   | V        | -52.5                | -38.83                       | 6.46            | 8.48                  | -13         | -36.81                                 |
|                                                                                     | 7400.8                   | H        | -67.33               | -49.56                       | 7.71            | 8.72                  | -13         | -48.55                                 |
|                                                                                     | 7400.8                   | V        | -72.43               | -55.56                       | 7.71            | 8.72                  | -13         | -54.55                                 |
|                                                                                     | 9251                     | H        | -69.48               | -42.87                       | 9.40            | 9.41                  | -13         | -42.87                                 |
|                                                                                     | 9251                     | V        | -67.44               | -48.24                       | 9.40            | 9.41                  | -13         | -48.24                                 |
|                                                                                     | 11101.2                  | H        | -74.71               | -48.36                       | 9.01            | 10.70                 | -13         | -46.67                                 |
|                                                                                     | 11101.2                  | V        | -75.06               | -48.76                       | 9.01            | 10.70                 | -13         | -47.07                                 |
|                                                                                     | 12951.4                  | H        | -72.42               | -45.25                       | 13.02           | 11.17                 | -13         | -47.10                                 |
|                                                                                     | 12951.4                  | V        | -73.55               | -48.53                       | 13.02           | 11.17                 | -13         | -50.38                                 |
|                                                                                     | 14801.6                  | H        | -77.66               | -33.52                       | 13.60           | 10.37                 | -13         | -36.75                                 |
|                                                                                     | 14801.6                  | V        | -78.5                | -36.98                       | 13.60           | 10.37                 | -13         | -40.21                                 |
|                                                                                     | 16651.8                  | H        | -77.73               | -32.92                       | 17.75           | 13.70                 | -13         | -36.97                                 |
|                                                                                     | 16651.8                  | V        | -78.1                | -31.38                       | 17.75           | 13.70                 | -13         | -35.43                                 |
| GSM 1900/Channel 661                                                                | 18502                    | H        | -79.96               | -33.09                       | 16.73           | 7.78                  | -13         | -42.04                                 |
|                                                                                     | 18502                    | V        | -79.56               | -32.49                       | 16.73           | 7.78                  | -13         | -41.44                                 |
|                                                                                     | 3760                     | H        | -47.32               | -37.17                       | 4.87            | 7.07                  | -13         | -34.97                                 |
|                                                                                     | 3760                     | V        | -50.82               | -39.64                       | 4.87            | 7.07                  | -13         | -37.44                                 |
|                                                                                     | 5640                     | H        | -52.4                | -38.63                       | 6.45            | 8.84                  | -13         | -36.24                                 |
|                                                                                     | 5640                     | V        | -53.64               | -40.84                       | 6.45            | 8.84                  | -13         | -38.45                                 |
|                                                                                     | 7520                     | H        | -74.04               | -55.99                       | 7.62            | 9.02                  | -13         | -54.59                                 |
|                                                                                     | 7520                     | V        | -72.18               | -55.25                       | 7.62            | 9.02                  | -13         | -53.85                                 |
|                                                                                     | 9400                     | H        | -70.37               | -46.85                       | 9.50            | 9.52                  | -13         | -46.83                                 |
|                                                                                     | 9400                     | V        | -70.64               | -49.58                       | 9.50            | 9.52                  | -13         | -49.56                                 |
|                                                                                     | 11280                    | H        | -71.36               | -45.56                       | 8.02            | 10.65                 | -13         | -42.94                                 |
|                                                                                     | 11280                    | V        | -72.07               | -45.93                       | 8.02            | 10.65                 | -13         | -43.31                                 |
|                                                                                     | 13160                    | H        | -71.64               | -43.84                       | 13.67           | 10.82                 | -13         | -46.70                                 |
|                                                                                     | 13160                    | V        | -71.97               | -46.61                       | 13.67           | 10.82                 | -13         | -49.47                                 |
|                                                                                     | 15040                    | H        | -79.14               | -28.07                       | 14.10           | 10.93                 | -13         | -31.24                                 |
|                                                                                     | 15040                    | V        | -79.34               | -30.49                       | 14.10           | 10.93                 | -13         | -33.66                                 |
| GSM 1900/Channel 810                                                                | 16920                    | H        | -77.32               | -38.58                       | 15.57           | 12.01                 | -13         | -42.14                                 |
|                                                                                     | 16920                    | V        | -73.99               | -33.28                       | 15.57           | 12.01                 | -13         | -36.84                                 |
|                                                                                     | 18800                    | H        | -79.4                | -31                          | 15.81           | 7.28                  | -13         | -39.52                                 |
|                                                                                     | 18800                    | V        | -79.24               | -33.5                        | 15.81           | 7.28                  | -13         | -42.02                                 |
|                                                                                     | 3819.6                   | H        | -48.93               | -38.04                       | 4.99            | 6.73                  | -13         | -36.29                                 |
|                                                                                     | 3819.6                   | V        | -49.58               | -38.28                       | 4.99            | 6.73                  | -13         | -36.53                                 |
|                                                                                     | 5729.4                   | H        | -53.03               | -37.11                       | 6.71            | 9.27                  | -13         | -34.55                                 |
|                                                                                     | 5729.4                   | V        | -55.25               | -40.15                       | 6.71            | 9.27                  | -13         | -37.59                                 |
|                                                                                     | 7639.2                   | H        | -71.24               | -52.83                       | 7.43            | 9.20                  | -13         | -51.06                                 |
|                                                                                     | 7639.2                   | V        | -71.64               | -54.21                       | 7.43            | 9.20                  | -13         | -52.44                                 |
|                                                                                     | 9549                     | H        | -70.1                | -46.8                        | 9.61            | 9.77                  | -13         | -46.63                                 |
|                                                                                     | 9549                     | V        | -69.06               | -48.09                       | 9.61            | 9.77                  | -13         | -47.92                                 |
|                                                                                     | 11458.8                  | H        | -72.96               | -48.12                       | 9.19            | 10.54                 | -13         | -46.77                                 |
|                                                                                     | 11458.8                  | V        | -73.59               | -49.31                       | 9.19            | 10.54                 | -13         | -47.96                                 |
|                                                                                     | 13368.6                  | H        | -66.3                | -39.19                       | 13.51           | 10.70                 | -13         | -42.00                                 |
|                                                                                     | 13368.6                  | V        | -66.98               | -41.97                       | 13.51           | 10.70                 | -13         | -44.78                                 |
|                                                                                     | 15278.4                  | H        | -78.34               | -40.39                       | 13.99           | 11.91                 | -13         | -42.47                                 |
|                                                                                     | 15278.4                  | V        | -78.47               | -42.45                       | 13.99           | 11.91                 | -13         | -44.53                                 |
|                                                                                     | 17188.2                  | H        | -70.83               | -28.18                       | 13.11           | 11.27                 | -13         | -30.02                                 |
|                                                                                     | 17188.2                  | V        | -70.49               | -27.34                       | 13.11           | 11.27                 | -13         | -29.18                                 |
|                                                                                     | 19098                    | H        | -79.6                | -31.64                       | 15.36           | 5.52                  | -13         | -41.48                                 |
|                                                                                     | 19098                    | V        | -79.37               | -34.95                       | 15.36           | 5.52                  | -13         | -44.79                                 |
|                                                                                     |                          |          |                      |                              |                 |                       |             | F=B-C+D                                |

**Worst Case Spurious Measurements – GSM 1900 Band – EDGE Mode**

| Radiated Spurious Emissions Measurement                                             |                          |          |                      |                              |                 |                       |             |                                        |
|-------------------------------------------------------------------------------------|--------------------------|----------|----------------------|------------------------------|-----------------|-----------------------|-------------|----------------------------------------|
| Test Engineer: Jason Centers                                                        |                          |          |                      |                              |                 |                       |             |                                        |
| Test Date: 12/27/2013                                                               |                          |          |                      |                              |                 |                       |             |                                        |
| Temp. / Humidity / Pressure: 22.9C/20.7%/997.1mbar                                  |                          |          |                      |                              |                 |                       |             |                                        |
| Bandwidth Settings: RBW = VBW = 1MHz                                                |                          |          |                      |                              |                 |                       |             |                                        |
| Notes: Spurious emissions not reported here were below the measurement noise floor. |                          |          |                      |                              |                 |                       |             |                                        |
|                                                                                     |                          |          | A                    | B                            | C               | D                     | E           | F                                      |
| Band/Channel                                                                        | Spurious Frequency (MHz) | Polarity | Device Reading (dBm) | Signal Generator Level (dBm) | Cable Loss (dB) | Tx Antenna Gain (dBd) | Limit (dBm) | Radiated Spurious Emission Level (dBm) |
| GSM 1900/Channel 512                                                                | 3700.4                   | H        | -50.36               | -39.89                       | 4.92            | 7.07                  | -13         | -37.74                                 |
|                                                                                     | 3700.4                   | V        | -49.84               | -37.53                       | 4.92            | 7.07                  | -13         | -35.38                                 |
|                                                                                     | 5550.6                   | H        | -51.63               | -37.29                       | 6.46            | 8.48                  | -13         | -35.27                                 |
|                                                                                     | 5550.6                   | V        | -48.49               | -34.82                       | 6.46            | 8.48                  | -13         | -32.80                                 |
|                                                                                     | 7400.8                   | H        | -68.92               | -51.15                       | 7.71            | 8.72                  | -13         | -50.14                                 |
|                                                                                     | 7400.8                   | V        | -71.93               | -55.06                       | 7.71            | 8.72                  | -13         | -54.05                                 |
|                                                                                     | 9251                     | H        | -67.28               | -40.67                       | 9.40            | 9.41                  | -13         | -40.67                                 |
|                                                                                     | 9251                     | V        | -66.43               | -47.23                       | 9.40            | 9.41                  | -13         | -47.23                                 |
|                                                                                     | 11101.2                  | H        | -75.46               | -49.11                       | 9.01            | 10.70                 | -13         | -47.42                                 |
|                                                                                     | 11101.2                  | V        | -75.03               | -48.73                       | 9.01            | 10.70                 | -13         | -47.04                                 |
|                                                                                     | 12951.4                  | H        | -73.54               | -46.37                       | 13.02           | 11.17                 | -13         | -48.22                                 |
|                                                                                     | 12951.4                  | V        | -73.51               | -48.49                       | 13.02           | 11.17                 | -13         | -50.34                                 |
|                                                                                     | 14801.6                  | H        | -78.23               | -34.09                       | 13.60           | 10.37                 | -13         | -37.32                                 |
|                                                                                     | 14801.6                  | V        | -77.85               | -36.33                       | 13.60           | 10.37                 | -13         | -39.56                                 |
|                                                                                     | 16651.8                  | H        | -78.44               | -33.63                       | 17.75           | 13.70                 | -13         | -37.68                                 |
|                                                                                     | 16651.8                  | V        | -78.81               | -32.09                       | 17.75           | 13.70                 | -13         | -36.14                                 |
| GSM 1900/Channel 661                                                                | 18502                    | H        | -79.79               | -32.92                       | 16.73           | 7.78                  | -13         | -41.87                                 |
|                                                                                     | 18502                    | V        | -79.22               | -32.15                       | 16.73           | 7.78                  | -13         | -41.10                                 |
|                                                                                     | 3760                     | H        | -49.26               | -39.11                       | 4.87            | 7.07                  | -13         | -36.91                                 |
|                                                                                     | 3760                     | V        | -52.34               | -41.16                       | 4.87            | 7.07                  | -13         | -38.96                                 |
|                                                                                     | 5640                     | H        | -51.72               | -37.95                       | 6.45            | 8.84                  | -13         | -35.56                                 |
|                                                                                     | 5640                     | V        | -46.07               | -33.27                       | 6.45            | 8.84                  | -13         | -30.88                                 |
|                                                                                     | 7520                     | H        | -71.75               | -53.7                        | 7.62            | 9.02                  | -13         | -52.30                                 |
|                                                                                     | 7520                     | V        | -72.7                | -55.77                       | 7.62            | 9.02                  | -13         | -54.37                                 |
|                                                                                     | 9400                     | H        | -70.19               | -46.67                       | 9.50            | 9.52                  | -13         | -46.65                                 |
|                                                                                     | 9400                     | V        | -67.24               | -46.18                       | 9.50            | 9.52                  | -13         | -46.16                                 |
|                                                                                     | 11280                    | H        | -72.59               | -46.79                       | 8.02            | 10.65                 | -13         | -44.17                                 |
|                                                                                     | 11280                    | V        | -70.02               | -43.88                       | 8.02            | 10.65                 | -13         | -41.26                                 |
|                                                                                     | 13160                    | H        | -72.38               | -44.58                       | 13.67           | 10.82                 | -13         | -47.44                                 |
|                                                                                     | 13160                    | V        | -73.61               | -48.25                       | 13.67           | 10.82                 | -13         | -51.11                                 |
|                                                                                     | 15040                    | H        | -78.81               | -27.74                       | 14.10           | 10.93                 | -13         | -30.91                                 |
|                                                                                     | 15040                    | V        | -79.3                | -30.45                       | 14.10           | 10.93                 | -13         | -33.62                                 |
| GSM 1900/Channel 810                                                                | 16920                    | H        | -77.54               | -38.8                        | 15.57           | 12.01                 | -13         | -42.36                                 |
|                                                                                     | 16920                    | V        | -77.88               | -37.17                       | 15.57           | 12.01                 | -13         | -40.73                                 |
|                                                                                     | 18800                    | H        | -78.25               | -29.85                       | 15.81           | 7.28                  | -13         | -38.37                                 |
|                                                                                     | 18800                    | V        | -79.15               | -33.41                       | 15.81           | 7.28                  | -13         | -41.93                                 |
|                                                                                     | 3819.6                   | H        | -48.76               | -37.87                       | 4.99            | 6.73                  | -13         | -36.12                                 |
|                                                                                     | 3819.6                   | V        | -51.15               | -39.85                       | 4.99            | 6.73                  | -13         | -38.10                                 |
|                                                                                     | 5729.4                   | H        | -45.2                | -29.28                       | 6.71            | 9.27                  | -13         | -26.72                                 |
|                                                                                     | 5729.4                   | V        | -50.24               | -35.14                       | 6.71            | 9.27                  | -13         | -32.58                                 |
|                                                                                     | 7639.2                   | H        | -72.24               | -53.83                       | 7.43            | 9.20                  | -13         | -52.06                                 |
|                                                                                     | 7639.2                   | V        | -71.98               | -54.55                       | 7.43            | 9.20                  | -13         | -52.78                                 |
|                                                                                     | 9549                     | H        | -70.5                | -47.2                        | 9.61            | 9.77                  | -13         | -47.03                                 |
|                                                                                     | 9549                     | V        | -68.4                | -47.43                       | 9.61            | 9.77                  | -13         | -47.26                                 |
|                                                                                     | 11458.8                  | H        | -70.7                | -45.86                       | 9.19            | 10.54                 | -13         | -44.51                                 |
|                                                                                     | 11458.8                  | V        | -71.48               | -47.2                        | 9.19            | 10.54                 | -13         | -45.85                                 |
|                                                                                     | 13368.6                  | H        | -66.82               | -39.71                       | 13.51           | 10.70                 | -13         | -42.52                                 |
|                                                                                     | 13368.6                  | V        | -68                  | -42.99                       | 13.51           | 10.70                 | -13         | -45.80                                 |
|                                                                                     | 15278.4                  | H        | -78.53               | -40.58                       | 13.99           | 11.91                 | -13         | -42.66                                 |
|                                                                                     | 15278.4                  | V        | -78.01               | -41.99                       | 13.99           | 11.91                 | -13         | -44.07                                 |
|                                                                                     | 17188.2                  | H        | -65.83               | -23.18                       | 13.11           | 11.27                 | -13         | -25.02                                 |
|                                                                                     | 17188.2                  | V        | -65.95               | -22.8                        | 13.11           | 11.27                 | -13         | -24.64                                 |
|                                                                                     | 19098                    | H        | -79.05               | -31.09                       | 15.36           | 5.52                  | -13         | -40.93                                 |
|                                                                                     | 19098                    | V        | -78.8                | -34.38                       | 15.36           | 5.52                  | -13         | -44.22                                 |
|                                                                                     |                          |          |                      |                              |                 |                       |             | F=B-C+D                                |

**Worst Case Spurious Measurements – WCDMA Band V**

| Radiated Spurious Emissions Measurement                                             |                          |          |                      |                              |                 |                       |             |                                        |
|-------------------------------------------------------------------------------------|--------------------------|----------|----------------------|------------------------------|-----------------|-----------------------|-------------|----------------------------------------|
| Test Engineer: Jason Centers                                                        |                          |          |                      |                              |                 |                       |             |                                        |
| Test Date: 12/26/2013                                                               |                          |          |                      |                              |                 |                       |             |                                        |
| Temp. / Humidity / Pressure: 24.2C/20.1%/996.6mbar                                  |                          |          |                      |                              |                 |                       |             |                                        |
| Bandwidth Settings: RBW = VBW = 1MHz                                                |                          |          |                      |                              |                 |                       |             |                                        |
| Notes: Spurious emissions not reported here were below the measurement noise floor. |                          |          |                      |                              |                 |                       |             |                                        |
|                                                                                     |                          |          | A                    | B                            | C               | D                     | E           | F                                      |
| Band/Channel                                                                        | Spurious Frequency (MHz) | Polarity | Device Reading (dBm) | Signal Generator Level (dBm) | Cable Loss (dB) | Tx Antenna Gain (dBd) | Limit (dBm) | Radiated Spurious Emission Level (dBm) |
| WCDMA Band V / Channel 4132                                                         | 1652.8                   | H        | -53.99               | -52.18                       | 2.84            | 6.70                  | -13         | -48.32                                 |
|                                                                                     | 1652.8                   | V        | -51.92               | -48.9                        | 2.84            | 6.70                  | -13         | -45.04                                 |
|                                                                                     | 2479.2                   | H        | -65.01               | -58.02                       | 3.62            | 7.16                  | -13         | -54.48                                 |
|                                                                                     | 2479.2                   | V        | -66.02               | -57.26                       | 3.62            | 7.16                  | -13         | -53.72                                 |
|                                                                                     | 3305.6                   | H        | -74.76               | -66.06                       | 4.48            | 7.19                  | -13         | -63.35                                 |
|                                                                                     | 3305.6                   | V        | -74.32               | -64.56                       | 4.48            | 7.19                  | -13         | -61.85                                 |
|                                                                                     | 4132                     | H        | -79.87               | -68.94                       | 5.34            | 8.15                  | -13         | -66.14                                 |
|                                                                                     | 4132                     | V        | -79.79               | -68.88                       | 5.34            | 8.15                  | -13         | -66.08                                 |
|                                                                                     | 4958.4                   | H        | -81.08               | -66.92                       | 6.32            | 8.80                  | -13         | -64.44                                 |
|                                                                                     | 4958.4                   | V        | -80.8                | -67.35                       | 6.32            | 8.80                  | -13         | -64.87                                 |
|                                                                                     | 5784.8                   | H        | -81.74               | -66.05                       | 6.43            | 9.27                  | -13         | -63.21                                 |
|                                                                                     | 5784.8                   | V        | -81.56               | -67.05                       | 6.43            | 9.27                  | -13         | -64.21                                 |
|                                                                                     | 6611.2                   | H        | -81.25               | -64.22                       | 7.23            | 9.81                  | -13         | -61.64                                 |
|                                                                                     | 6611.2                   | V        | -80.65               | -64.27                       | 7.23            | 9.81                  | -13         | -61.69                                 |
|                                                                                     | 7437.6                   | H        | -81.23               | -63.18                       | 7.71            | 8.72                  | -13         | -62.17                                 |
|                                                                                     | 7437.6                   | V        | -81.38               | -64.19                       | 7.71            | 8.72                  | -13         | -63.18                                 |
| WCDMA Band V / Channel 4182                                                         | 8264                     | H        | -82.37               | -62.45                       | 8.25            | 9.16                  | -13         | -61.54                                 |
|                                                                                     | 8264                     | V        | -82.48               | -63.62                       | 8.25            | 9.16                  | -13         | -62.71                                 |
|                                                                                     | 1672.8                   | H        | -47.12               | -44.46                       | 2.93            | 6.70                  | -13         | -40.69                                 |
|                                                                                     | 1672.8                   | V        | -49.27               | -45.49                       | 2.93            | 6.70                  | -13         | -41.72                                 |
|                                                                                     | 2509.2                   | H        | -73.12               | -66.05                       | 3.69            | 7.43                  | -13         | -62.31                                 |
|                                                                                     | 2509.2                   | V        | -73.04               | -64.24                       | 3.69            | 7.43                  | -13         | -60.50                                 |
|                                                                                     | 3345.6                   | H        | -74.57               | -66.11                       | 4.53            | 7.19                  | -13         | -63.46                                 |
|                                                                                     | 3345.6                   | V        | -74.58               | -65.11                       | 4.53            | 7.19                  | -13         | -62.46                                 |
|                                                                                     | 4182                     | H        | -80.4                | -69                          | 5.36            | 8.15                  | -13         | -66.21                                 |
|                                                                                     | 4182                     | V        | -80.14               | -69.23                       | 5.36            | 8.15                  | -13         | -66.44                                 |
|                                                                                     | 5018.4                   | H        | -81.38               | -66.72                       | 6.29            | 8.87                  | -13         | -64.14                                 |
|                                                                                     | 5018.4                   | V        | -81.52               | -67.89                       | 6.29            | 8.87                  | -13         | -65.31                                 |
|                                                                                     | 5854.8                   | H        | -81.56               | -65.36                       | 6.44            | 9.57                  | -13         | -62.23                                 |
|                                                                                     | 5854.8                   | V        | -81.61               | -66.15                       | 6.44            | 9.57                  | -13         | -63.02                                 |
|                                                                                     | 6691.2                   | H        | -81.54               | -63.59                       | 7.23            | 9.81                  | -13         | -61.01                                 |
|                                                                                     | 6691.2                   | V        | -81.41               | -64.15                       | 7.23            | 9.81                  | -13         | -61.57                                 |
| WCDMA Band V / Channel 4233                                                         | 7527.6                   | H        | -81.23               | -62.76                       | 7.62            | 9.02                  | -13         | -61.36                                 |
|                                                                                     | 7527.6                   | V        | -81.28               | -64                          | 7.62            | 9.02                  | -13         | -62.60                                 |
|                                                                                     | 8364                     | H        | -81.96               | -62.49                       | 8.27            | 9.22                  | -13         | -61.54                                 |
|                                                                                     | 8364                     | V        | -82.08               | -63.5                        | 8.27            | 9.22                  | -13         | -62.55                                 |
|                                                                                     | 1693.2                   | H        | -44.9                | -41.96                       | 2.94            | 6.70                  | -13         | -38.19                                 |
|                                                                                     | 1693.2                   | V        | -46.89               | -42.57                       | 2.94            | 6.70                  | -13         | -38.80                                 |
|                                                                                     | 2539.8                   | H        | -68.62               | -61.21                       | 3.78            | 7.43                  | -13         | -57.57                                 |
|                                                                                     | 2539.8                   | V        | -60.92               | -51.57                       | 3.78            | 7.43                  | -13         | -47.93                                 |
|                                                                                     | 3386.4                   | H        | -75.49               | -66.58                       | 4.62            | 7.19                  | -13         | -64.01                                 |
|                                                                                     | 3386.4                   | V        | -72.02               | -62.4                        | 4.62            | 7.19                  | -13         | -59.83                                 |
|                                                                                     | 4233                     | H        | -80.18               | -68.88                       | 5.52            | 8.37                  | -13         | -66.03                                 |
|                                                                                     | 4233                     | V        | -80.06               | -69.37                       | 5.52            | 8.37                  | -13         | -66.52                                 |
|                                                                                     | 5079.6                   | H        | -81.18               | -66.88                       | 6.34            | 8.87                  | -13         | -64.35                                 |
|                                                                                     | 5079.6                   | V        | -81.2                | -67.89                       | 6.34            | 8.87                  | -13         | -65.36                                 |
|                                                                                     | 5926.2                   | H        | -81.32               | -64.77                       | 7.11            | 9.53                  | -13         | -62.35                                 |
|                                                                                     | 5926.2                   | V        | -81.47               | -65.65                       | 7.11            | 9.53                  | -13         | -63.23                                 |
|                                                                                     | 6772.8                   | H        | -80.88               | -62.63                       | 7.43            | 9.55                  | -13         | -60.51                                 |
|                                                                                     | 6772.8                   | V        | -81.02               | -63.95                       | 7.43            | 9.55                  | -13         | -61.83                                 |
|                                                                                     | 7619.4                   | H        | -80.96               | -62.58                       | 7.43            | 9.20                  | -13         | -60.81                                 |
|                                                                                     | 7619.4                   | V        | -81.28               | -64.13                       | 7.43            | 9.20                  | -13         | -62.36                                 |
|                                                                                     | 8466                     | H        | -81.77               | -62.18                       | 8.36            | 9.13                  | -13         | -61.41                                 |
|                                                                                     | 8466                     | V        | -81.72               | -63.09                       | 8.36            | 9.13                  | -13         | -62.32                                 |
|                                                                                     |                          |          |                      |                              |                 |                       |             | F=B-C+D                                |

**Worst Case Spurious Measurements – WCDMA Band II**

| Radiated Spurious Emissions Measurement                                             |                          |          |                      |                              |                 |                       |             |                                        |
|-------------------------------------------------------------------------------------|--------------------------|----------|----------------------|------------------------------|-----------------|-----------------------|-------------|----------------------------------------|
| Test Engineer: Jason Centers                                                        |                          |          |                      |                              |                 |                       |             |                                        |
| Test Date: 12/27/2013                                                               |                          |          |                      |                              |                 |                       |             |                                        |
| Temp. / Humidity / Pressure: 22.9C/20.7%/997.1mbar                                  |                          |          |                      |                              |                 |                       |             |                                        |
| Bandwidth Settings: RBW = VBW = 1MHz                                                |                          |          |                      |                              |                 |                       |             |                                        |
| Notes: Spurious emissions not reported here were below the measurement noise floor. |                          |          |                      |                              |                 |                       |             |                                        |
| Band/Channel                                                                        | Spurious Frequency (MHz) | Polarity | Device Reading (dBm) | Signal Generator Level (dBm) | Cable Loss (dB) | Tx Antenna Gain (dBd) | Limit (dBm) | Radiated Spurious Emission Level (dBm) |
| UMTS Band II/Channel 9262                                                           | 3704.8                   | H        | -63.83               | -53.36                       | 4.88            | 7.07                  | -13         | -51.17                                 |
|                                                                                     | 3704.8                   | V        | -68.34               | -56.03                       | 4.88            | 7.07                  | -13         | -53.84                                 |
|                                                                                     | 5557.2                   | H        | -75.41               | -61.07                       | 6.52            | 8.48                  | -13         | -59.11                                 |
|                                                                                     | 5557.2                   | V        | -64.81               | -51.14                       | 6.52            | 8.48                  | -13         | -49.18                                 |
|                                                                                     | 7409.6                   | H        | -80.56               | -62.79                       | 7.71            | 8.72                  | -13         | -61.78                                 |
|                                                                                     | 7409.6                   | V        | -80.83               | -63.96                       | 7.71            | 8.72                  | -13         | -62.95                                 |
|                                                                                     | 9262                     | H        | -79.5                | -52.89                       | 9.40            | 9.41                  | -13         | -52.89                                 |
|                                                                                     | 9262                     | V        | -78.96               | -59.76                       | 9.40            | 9.41                  | -13         | -59.76                                 |
|                                                                                     | 11114.4                  | H        | -83.7                | -57.35                       | 9.01            | 10.70                 | -13         | -55.66                                 |
|                                                                                     | 11114.4                  | V        | -83.72               | -57.42                       | 9.01            | 10.70                 | -13         | -55.73                                 |
|                                                                                     | 12966.8                  | H        | -83.53               | -56.36                       | 13.02           | 11.17                 | -13         | -58.21                                 |
|                                                                                     | 12966.8                  | V        | -83.58               | -58.56                       | 13.02           | 11.17                 | -13         | -60.41                                 |
|                                                                                     | 14819.2                  | H        | -84.13               | -39.99                       | 13.60           | 10.37                 | -13         | -43.22                                 |
|                                                                                     | 14819.2                  | V        | -84.05               | -42.53                       | 13.60           | 10.37                 | -13         | -45.76                                 |
|                                                                                     | 16671.6                  | H        | -83.66               | -38.85                       | 17.75           | 13.70                 | -13         | -42.90                                 |
|                                                                                     | 16671.6                  | V        | -83.51               | -36.79                       | 17.75           | 13.70                 | -13         | -40.84                                 |
|                                                                                     | 18524                    | H        | -85.03               | -38.16                       | 16.73           | 7.78                  | -13         | -47.11                                 |
|                                                                                     | 18524                    | V        | -85.17               | -38.1                        | 16.73           | 7.78                  | -13         | -47.05                                 |
| UMTS Band II/Channel 9400                                                           | 3760                     | H        | -63.12               | -52.97                       | 4.87            | 7.07                  | -13         | -50.77                                 |
|                                                                                     | 3760                     | V        | -60.9                | -49.72                       | 4.87            | 7.07                  | -13         | -47.52                                 |
|                                                                                     | 5640                     | H        | -72.28               | -58.51                       | 6.45            | 8.84                  | -13         | -56.12                                 |
|                                                                                     | 5640                     | V        | -71.42               | -58.62                       | 6.45            | 8.84                  | -13         | -56.23                                 |
|                                                                                     | 7520                     | H        | -80.76               | -62.71                       | 7.62            | 9.02                  | -13         | -61.31                                 |
|                                                                                     | 7520                     | V        | -81.37               | -64.44                       | 7.62            | 9.02                  | -13         | -63.04                                 |
|                                                                                     | 9400                     | H        | -82.56               | -59.04                       | 9.50            | 9.52                  | -13         | -59.02                                 |
|                                                                                     | 9400                     | V        | -82.65               | -61.59                       | 9.50            | 9.52                  | -13         | -61.57                                 |
|                                                                                     | 11280                    | H        | -83.35               | -57.55                       | 8.02            | 10.65                 | -13         | -54.93                                 |
|                                                                                     | 11280                    | V        | -83.2                | -57.06                       | 8.02            | 10.65                 | -13         | -54.44                                 |
|                                                                                     | 13160                    | H        | -83.57               | -55.77                       | 13.67           | 10.82                 | -13         | -58.63                                 |
|                                                                                     | 13160                    | V        | -83.03               | -57.67                       | 13.67           | 10.82                 | -13         | -60.53                                 |
|                                                                                     | 15040                    | H        | -84.56               | -33.49                       | 14.10           | 10.93                 | -13         | -36.66                                 |
|                                                                                     | 15040                    | V        | -85.03               | -36.18                       | 14.10           | 10.93                 | -13         | -39.35                                 |
|                                                                                     | 16920                    | H        | -83.7                | -44.96                       | 15.57           | 12.01                 | -13         | -48.52                                 |
|                                                                                     | 16920                    | V        | -83.5                | -42.79                       | 15.57           | 12.01                 | -13         | -46.35                                 |
|                                                                                     | 18800                    | H        | -84.51               | -36.11                       | 15.81           | 7.28                  | -13         | -44.63                                 |
|                                                                                     | 18800                    | V        | -84.3                | -38.56                       | 15.81           | 7.28                  | -13         | -47.08                                 |
| UMTS Band II/Channel 9538                                                           | 3815.2                   | H        | -59.97               | -49.08                       | 5.00            | 6.73                  | -13         | -47.35                                 |
|                                                                                     | 3815.2                   | V        | -60.67               | -49.37                       | 5.00            | 6.73                  | -13         | -47.64                                 |
|                                                                                     | 5722.8                   | H        | -63.78               | -47.86                       | 6.89            | 9.27                  | -13         | -45.49                                 |
|                                                                                     | 5722.8                   | V        | -61.13               | -46.03                       | 6.89            | 9.27                  | -13         | -43.66                                 |
|                                                                                     | 7630.4                   | H        | -81.94               | -63.53                       | 7.43            | 9.20                  | -13         | -61.76                                 |
|                                                                                     | 7630.4                   | V        | -81.18               | -63.75                       | 7.43            | 9.20                  | -13         | -61.98                                 |
|                                                                                     | 9538                     | H        | -82.07               | -58.77                       | 9.61            | 9.77                  | -13         | -58.60                                 |
|                                                                                     | 9538                     | V        | -82.84               | -61.87                       | 9.61            | 9.77                  | -13         | -61.70                                 |
|                                                                                     | 11445.6                  | H        | -82.83               | -57.99                       | 9.19            | 10.54                 | -13         | -56.64                                 |
|                                                                                     | 11445.6                  | V        | -83.1                | -58.82                       | 9.19            | 10.54                 | -13         | -57.47                                 |
|                                                                                     | 13353.2                  | H        | -83.65               | -56.54                       | 13.51           | 10.70                 | -13         | -59.35                                 |
|                                                                                     | 13353.2                  | V        | -82.93               | -57.92                       | 13.51           | 10.70                 | -13         | -60.73                                 |
|                                                                                     | 15260.8                  | H        | -83.75               | -45.8                        | 13.99           | 11.91                 | -13         | -47.88                                 |
|                                                                                     | 15260.8                  | V        | -84.09               | -48.07                       | 13.99           | 11.91                 | -13         | -50.15                                 |
|                                                                                     | 17168.4                  | H        | -83.83               | -41.18                       | 13.11           | 11.27                 | -13         | -43.02                                 |
|                                                                                     | 17168.4                  | V        | -83.89               | -40.74                       | 13.11           | 11.27                 | -13         | -42.58                                 |
|                                                                                     | 19076                    | H        | -84.9                | -36.94                       | 15.36           | 5.52                  | -13         | -46.78                                 |
|                                                                                     | 19076                    | V        | -84.96               | -40.54                       | 15.36           | 5.52                  | -13         | -50.38                                 |
|                                                                                     |                          |          |                      |                              |                 |                       |             | F=B-C+D                                |

## 9 Frequency Stability

### 9.1 Test Limits

§ 2.1055, §22.355, §24.235

The frequency stability of the transmitter was required to maintain a  $\pm 2.5$ ppm tolerance.

### 9.2 Test Procedure

The equipment under test was connected to an AC variac and the RF output was connected to a Base Station Simulator. The Base Station Simulator was set to force the EUT to its maximum power setting. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for that purpose. After the temperature stabilized for approximately 30 minutes, the frequency error was read from the base station simulator. At 20C the input voltage was varied from 85% to 115% and the frequency stability vs input voltage was recorded.

### 9.3 Test Equipment Used:

| Description            | Serial Number | Manufacturer  | Model  | Cal. Date   | Cal. Due    |
|------------------------|---------------|---------------|--------|-------------|-------------|
| Base Station Simulator | 3917          | Rohde&Schwarz | CMW500 | 9/26/2013   | 9/26/2014   |
| Environmental Chamber  | 3947          | Test Equity   | 115A   | Time Of Use | Time Of Use |
| Multimeter/Temp Meter  | 3400          | Fluke         | 289    | 5/29/2013   | 5/29/2014   |

**9.4 Results:**

The tables below show the frequency stability data for both Cell and PCS Bands. In both cases the test sample met the  $\pm 2.5$ ppm limit.

**Frequency Stability for GSM 850 Band – GPRS Mode**

| <b>Operating Frequency:</b> 837,000,000 Hz                   |               |           |                      |               |                 |
|--------------------------------------------------------------|---------------|-----------|----------------------|---------------|-----------------|
| <b>Channel:</b> 192                                          |               |           |                      |               |                 |
| <b>Reference Voltage:</b> 115 VAC                            |               |           |                      |               |                 |
| <b>Deviation Limit:</b> 2.5 ppm                              |               |           |                      |               |                 |
| <b>Notes:</b> Frequency Stability in GSM 850 Band, GPRS Mode |               |           |                      |               |                 |
| Voltage (%)                                                  | Voltage (VAC) | Temp (°C) | Frequency Error (Hz) | Deviation (%) | Deviation (ppm) |
| 100%                                                         | 115           | -30       | 41.75                | 0.0000050     | 0.0499          |
| 100%                                                         | 115           | -20       | 38.75                | 0.0000046     | 0.0463          |
| 100%                                                         | 115           | -10       | 34.23                | 0.0000041     | 0.0409          |
| 100%                                                         | 115           | 0         | 39.07                | 0.0000047     | 0.0467          |
| 100%                                                         | 115           | 10        | 35.89                | 0.0000043     | 0.0429          |
| 100%                                                         | 115           | 20        | 32.3                 | 0.0000039     | 0.0386          |
| 100%                                                         | 115           | 30        | 36.2                 | 0.0000043     | 0.0432          |
| 100%                                                         | 115           | 40        | 34.26                | 0.0000041     | 0.0409          |
| 100%                                                         | 115           | 50        | 41.41                | 0.0000049     | 0.0495          |
| 100%                                                         | 115           | 60        | 12.98                | 0.0000016     | 0.0155          |
| 115%                                                         | 138           | 20        | 41.4                 | 0.0000049     | 0.0495          |
| 85%                                                          | 93.5          | 20        | 35.1                 | 0.0000042     | 0.0419          |

**Frequency Stability for GSM 1900 Band – GPRS Mode**

| <b>Operating Frequency:</b> 1,880,000,000 Hz                  |               |           |                      |               |                 |
|---------------------------------------------------------------|---------------|-----------|----------------------|---------------|-----------------|
| <b>Channel:</b> 661                                           |               |           |                      |               |                 |
| <b>Reference Voltage:</b> 115 VAC                             |               |           |                      |               |                 |
| <b>Deviation Limit:</b> 2.5 ppm                               |               |           |                      |               |                 |
| <b>Notes:</b> Frequency Stability in GSM 1900 Band, GPRS Mode |               |           |                      |               |                 |
| Voltage (%)                                                   | Voltage (VAC) | Temp (°C) | Frequency Error (Hz) | Deviation (%) | Deviation (ppm) |
| 100%                                                          | 115           | -30       | 80.65                | 0.0000043     | 0.0429          |
| 100%                                                          | 115           | -20       | 41.65                | 0.0000022     | 0.0222          |
| 100%                                                          | 115           | -10       | 32.42                | 0.0000017     | 0.0172          |
| 100%                                                          | 115           | 0         | 19.73                | 0.0000010     | 0.0105          |
| 100%                                                          | 115           | 10        | 21.71                | 0.0000012     | 0.0115          |
| 100%                                                          | 115           | 20        | 18.8                 | 0.0000010     | 0.0100          |
| 100%                                                          | 115           | 30        | 23.61                | 0.0000013     | 0.0126          |
| 100%                                                          | 115           | 40        | 24.2                 | 0.0000013     | 0.0129          |
| 100%                                                          | 115           | 50        | 29.82                | 0.0000016     | 0.0159          |
| 100%                                                          | 115           | 60        | 52.81                | 0.0000028     | 0.0281          |
| 115%                                                          | 138           | 20        | 22.1                 | 0.0000012     | 0.0118          |
| 85%                                                           | 93.5          | 20        | 27.5                 | 0.0000015     | 0.0146          |

**Frequency Stability for GSM 850 Band – EDGE Mode**

| <b>Operating Frequency:</b> |               | 837,000,000 Hz                                 |                      |               |                 |
|-----------------------------|---------------|------------------------------------------------|----------------------|---------------|-----------------|
| <b>Channel:</b>             |               | 192                                            |                      |               |                 |
| <b>Reference Voltage:</b>   |               | 115 VAC                                        |                      |               |                 |
| <b>Deviation Limit:</b>     |               | 2.5 ppm                                        |                      |               |                 |
| <b>Notes:</b>               |               | Frequency Stability in GSM 850 Band, EDGE Mode |                      |               |                 |
| Voltage (%)                 | Voltage (VAC) | Temp (°C)                                      | Frequency Error (Hz) | Deviation (%) | Deviation (ppm) |
| 100%                        | 115           | -30                                            | 27.44                | 0.0000033     | 0.0328          |
| 100%                        | 115           | -20                                            | 29.51                | 0.0000035     | 0.0353          |
| 100%                        | 115           | -10                                            | 30.98                | 0.0000037     | 0.0370          |
| 100%                        | 115           | 0                                              | 32.87                | 0.0000039     | 0.0393          |
| 100%                        | 115           | 10                                             | 36.7                 | 0.0000044     | 0.0438          |
| 100%                        | 115           | 20                                             | 11.43                | 0.0000014     | 0.0137          |
| 100%                        | 115           | 30                                             | 28.14                | 0.0000034     | 0.0336          |
| 100%                        | 115           | 40                                             | 46.04                | 0.0000055     | 0.0550          |
| 100%                        | 115           | 50                                             | 38.78                | 0.0000046     | 0.0463          |
| 100%                        | 115           | 60                                             | 36.01                | 0.0000043     | 0.0430          |
| 115%                        | 138           | 20                                             | 31.4                 | 0.0000038     | 0.0375          |
| 85%                         | 93.5          | 20                                             | 31.87                | 0.0000038     | 0.0381          |

**Frequency Stability for GSM 1900 Band – EDGE Mode**

| <b>Operating Frequency:</b> |               | 1,880,000,000 Hz                                |                      |               |                 |
|-----------------------------|---------------|-------------------------------------------------|----------------------|---------------|-----------------|
| <b>Channel:</b>             |               | 661                                             |                      |               |                 |
| <b>Reference Voltage:</b>   |               | 115 VAC                                         |                      |               |                 |
| <b>Deviation Limit:</b>     |               | 2.5 ppm                                         |                      |               |                 |
| <b>Notes:</b>               |               | Frequency Stability in GSM 1900 Band, EDGE Mode |                      |               |                 |
| Voltage (%)                 | Voltage (VAC) | Temp (°C)                                       | Frequency Error (Hz) | Deviation (%) | Deviation (ppm) |
| 100%                        | 115           | -30                                             | 43.75                | 0.0000023     | 0.0233          |
| 100%                        | 115           | -20                                             | 48.91                | 0.0000026     | 0.0260          |
| 100%                        | 115           | -10                                             | 35.98                | 0.0000019     | 0.0191          |
| 100%                        | 115           | 0                                               | 56.98                | 0.0000030     | 0.0303          |
| 100%                        | 115           | 10                                              | 39.16                | 0.0000021     | 0.0208          |
| 100%                        | 115           | 20                                              | 14.6                 | 0.0000008     | 0.0078          |
| 100%                        | 115           | 30                                              | 57.37                | 0.0000031     | 0.0305          |
| 100%                        | 115           | 40                                              | 60.4                 | 0.0000032     | 0.0321          |
| 100%                        | 115           | 50                                              | 57.15                | 0.0000030     | 0.0304          |
| 100%                        | 115           | 60                                              | 66.12                | 0.0000035     | 0.0352          |
| 115%                        | 138           | 20                                              | 16.2                 | 0.0000009     | 0.0086          |
| 85%                         | 93.5          | 20                                              | 15.9                 | 0.0000008     | 0.0085          |

## Frequency Stability for WCDMA Band V

| <b>Operating Frequency:</b> |               | 836,400,000 Hz                           |                      |               |                 |
|-----------------------------|---------------|------------------------------------------|----------------------|---------------|-----------------|
| <b>Channel:</b>             |               | 4182                                     |                      |               |                 |
| <b>Reference Voltage:</b>   |               | 115 VAC                                  |                      |               |                 |
| <b>Deviation Limit:</b>     |               | 2.5 ppm                                  |                      |               |                 |
| <b>Notes:</b>               |               | Frequency Stability in WCDMA Band V Mode |                      |               |                 |
| Voltage (%)                 | Voltage (VAC) | Temp (°C)                                | Frequency Error (Hz) | Deviation (%) | Deviation (ppm) |
| 100%                        | 115           | -30                                      | 31.78                | 0.0000038     | 0.0380          |
| 100%                        | 115           | -20                                      | 34.42                | 0.0000041     | 0.0411          |
| 100%                        | 115           | -10                                      | 28.71                | 0.0000034     | 0.0343          |
| 100%                        | 115           | 0                                        | 24.48                | 0.0000029     | 0.0292          |
| 100%                        | 115           | 10                                       | 21.65                | 0.0000026     | 0.0259          |
| 100%                        | 115           | 20                                       | 22.49                | 0.0000027     | 0.0269          |
| 100%                        | 115           | 30                                       | 28.81                | 0.0000034     | 0.0344          |
| 100%                        | 115           | 40                                       | 16.87                | 0.0000020     | 0.0202          |
| 100%                        | 115           | 50                                       | 22.54                | 0.0000027     | 0.0269          |
| 100%                        | 115           | 60                                       | 26.34                | 0.0000031     | 0.0315          |
| 115%                        | 138           | 20                                       | 25.79                | 0.0000031     | 0.0308          |
| 85%                         | 93.5          | 20                                       | 18.74                | 0.0000022     | 0.0224          |

## Frequency Stability for WCDMA Band II

| <b>Operating Frequency:</b> |               | 1,880,000,000 Hz                          |                      |               |                 |
|-----------------------------|---------------|-------------------------------------------|----------------------|---------------|-----------------|
| <b>Channel:</b>             |               | 9400                                      |                      |               |                 |
| <b>Reference Voltage:</b>   |               | 115 VAC                                   |                      |               |                 |
| <b>Deviation Limit:</b>     |               | 2.5 ppm                                   |                      |               |                 |
| <b>Notes:</b>               |               | Frequency Stability in WCDMA Band II Mode |                      |               |                 |
| Voltage (%)                 | Voltage (VAC) | Temp (°C)                                 | Frequency Error (Hz) | Deviation (%) | Deviation (ppm) |
| 100%                        | 115           | -30                                       | 60.3                 | 0.0000032     | 0.0321          |
| 100%                        | 115           | -20                                       | 54.59                | 0.0000029     | 0.0290          |
| 100%                        | 115           | -10                                       | 42.68                | 0.0000023     | 0.0227          |
| 100%                        | 115           | 0                                         | 47.48                | 0.0000025     | 0.0253          |
| 100%                        | 115           | 10                                        | 39.88                | 0.0000021     | 0.0212          |
| 100%                        | 115           | 20                                        | 47.97                | 0.0000026     | 0.0255          |
| 100%                        | 115           | 30                                        | 52.83                | 0.0000028     | 0.0281          |
| 100%                        | 115           | 40                                        | 45.03                | 0.0000024     | 0.0240          |
| 100%                        | 115           | 50                                        | 41.43                | 0.0000022     | 0.0220          |
| 100%                        | 115           | 60                                        | 56.6                 | 0.0000030     | 0.0301          |
| 115%                        | 138           | 20                                        | 37.87                | 0.0000020     | 0.0201          |
| 85%                         | 93.5          | 20                                        | 32.67                | 0.0000017     | 0.0174          |

## 10 Measurement Uncertainty

The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements.

The measurement uncertainty figures were calculated and correspond to a coverage factor of  $k = 2$ , providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Measurement uncertainty Table

| Parameter                                        | Uncertainty | Notes |
|--------------------------------------------------|-------------|-------|
| Radiated emissions, 30 to 1000 MHz               | +3.9dB      |       |
| Radiated emissions, 1 to 18 GHz                  | +4.2dB      |       |
| Radiated emissions, 18 to 40 GHz                 | +4.3dB      |       |
| Power Port Conducted emissions, 150kHz to 30 MHz | +2.8dB      |       |

**11 Revision History**

| Revision Level | Date      | Report Number    | Notes          |
|----------------|-----------|------------------|----------------|
| 0              | 1/10/2014 | 101483717LEX-001 | Original Issue |
|                |           |                  |                |
|                |           |                  |                |
|                |           |                  |                |
|                |           |                  |                |
|                |           |                  |                |