# FCC / IC Test Report

**FOR:**

# GTX Corp

**Model Name: GTX-GSS-01**

**Product Description: GPS-embedded insoles with 2G/GSM/GPRS technology**

**FCC ID: 2AD9S-GTXGSS01**
**IC ID: 20166-GTXGSS01**

**47 CFR Part 2, 22, 24**

**RSS-GEN Issue 4, RSS-132 Issue 3, RSS-133 Issue 6**

**TEST REPORT #: EMC_GTXCO_001_14001_FCC22_24_WWAN**

**DATE: 2015-6-18**

**FCC:**
**A2LA Accredited**

**IC recognized #**
**3462E-1**


***CETECOM* Inc.**
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*CETECOM* Inc. is a Delaware Corporation with Corporation number: 2113686

# Table of Contents

## 1 Assessment

**The following device was evaluated against the applicable criteria specified in FCC rules parts 2, 22 and 24 of Title 47 of the Code of Federal Regulations and Industry Canada Standards RSS-Gen, RSS-132 and RSS-133.**
**No deviations were ascertained.**

| Company | Description | Model # |
|---|---|---|
| GTX Corp | GPS-embedded insoles with 2G/GSM/GPRS technology | GTX-GSS-01 |

**Responsible for Testing Laboratory:**

| Date | Section | Name | Signature |
|---|---|---|---|
| 2015-6-22 | Compliance | Josie Sabado (Test Lab Manager) | |

**Responsible for the Report:**

| Date | Section | Name | Signature |
|---|---|---|---|
| 2015-6-22 | Compliance | Anthony Planinac (EMC Engineer) | Anthony Planinac Digitally signed by Anthony Planinac DN: cn=Anthony Planinac, c=US, o=CETECOM, ou=EMC SD, email=Anthony.Planinac@CETECOM.com Reason: release Date: 2015.06.22 16:06:29 -07'00' |

The test results of this test report relate exclusively to the test item specified in Section3.
CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

# 2 Administrative Data

## 2.1 Identification of the Testing Laboratory Issuing the Test Report

| | |
|---|---|
| **Company Name:** | CETECOM Inc. |
| **Department:** | Compliance |
| **Address:** | 6370 Nancy Ridge Drive #101<br>San Diego, CA 92121<br>U.S.A. |
| **Telephone:** | +1 (858) 362-2400 |
| **Fax:** | +1 (858) 587-4809 |
| **Compliance Manager:** | Milton Deleon |
| **Responsible Project Leader:** | Anthony Planinac |

## 2.2 Identification of the Client

| | | |
|---|---|---|
| **Applicant's Name:** | GTX Corp | |
| **Street Address:** | 117 W 9th Street Suite 1219 | |
| **City/Zip Code** | Los Angeles, CA 90015 | |
| **Country** | USA | |
| **Contact Person:** | Li Wang | |
| **Phone No.** | +1 (213) 784-6767 | |
| **e-mail:** | lwang@gtxcorp.com | |

## 2.3 Identification of the Manufacturer

| | |
|---|---|
| **Manufacturer's Name:** | Same as client. |
| **Manufacturers Address:** | |
| **City/Zip Code** | |
| **Country** | |

# 3 Equipment under Test (EUT)

## 3.1 Specification of the Equipment under Test

| | |
|---|---|
| **Marketing Name:** | GPS SmartSole™ |
| **Model Number:** | GTX-GSS-01 |
| **FCC-ID :** | 2AD9S-GTXGSS01 |
| **IC ID:** | 20166-GTXGSS01 |
| **Product Description:** | GPS-embedded insoles with 2G/GSM/GPRS technology |
| **Technology / Type(s) of Modulation:** | Telit GE865 Radio Module, FCC-ID: RI7GE865, IC: 5131A-GE865<br>- GSM 850/1900MHz<br>- GPRS 850/1900MHz<br>GSM & GPRS : GMSK |
| **Operating Frequency Ranges (MHz) / Channels** (for US/CAN bands only): | GSM-850 band: 824-849 MHz uplink, 869-894 MHz downlink<br>Channels: 128 to 251<br>GSM-1900 band: 1850-1910 MHz uplink, 1930-1990 MHz downlink<br>Channels: 512 to 810 |
| **Antenna Information as declared:** | PCB monopole<br>GSM 850: -2.2dBi<br>GSM 1900: 3.2 dBi |
| **Power Supply/ Rated Operating Voltage Range:** | Internal battery 3.5V-4.2V<br>External supply for charging USB 5V |
| **Rated Operating Temperature Range:** | -20C to +60C<br>Recharge 0C to +45C |
| **Test Sample Status:** | Prototype |
| **Other Radios included in the device:** | GPS 1575.42 MHz (Ublox IT 530) |

## 3.2 Identification of the Equipment under Test (EUT)

| EUT # | Serial Number | Sample | IMEI |
|---|---|---|---|
| **1** | 1 | Conducted/Radiated | 356363054999596 |
| **2** | 2 | Conducted/Radiated | 356363054720570 |

## 3.3 Identification of Accessory equipment

| STE # | Type | Manufacturer | Model | Serial Number |
|---|---|---|---|---|
| **1** | Wireless Charging pad | PowerQi | Q-100 | 45009665L |
| **2** | AC Adapter | Shenzen Topow | TPA101-08050-US | E3395623VX0 |

## 3.4 Environmental conditions during Test

The following environmental conditions were maintained during the course of testing:

Ambient Temperature: 20-25$^{o}$C
Relative Humidity: 40-60%

## 3.5 Dates of Testing

10/6/2014 – 10/8/2014

## 4 Subject of Investigation

The objective of the measurements applied by CETECOM Inc. was to establish compliance of the EUT as described under Ch. 3 of this Test Report, with the applicable criteria specified in

- 47 CFR Part 2: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission Frequency allocations and radio treaty matters; general rules and regulations.
- 47 CFR Part 22: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission subchapter B- common carrier services; Part 22- Public mobile services
- 47 CFR Part 24: Title 47 of the Code of Federal Regulations: Chapter I-Federal Communications Commission subchapter B- common carrier services; Part 24- Personal communication services
- RSS-GEN- Issue 4: General Requirements and Information for the Certification of Radio Apparatus
- RSS-132- Issue 3: Spectrum management and telecommunication policy- Radio Standards Specifications Cellular telephones employing new technologies operating in the bands 824-849MHz and 869-894MHz
- RSS-133- Issue 6: Spectrum management and telecommunication policy- Radio Standards Specifications- 2GHz personal communication services

This test report is to support a request for new equipment authorization as single modular approval under the FCC ID: **2AD9S-GTXGSS01 and IC: 5131A-GE865**

All testing was performed on the product referred to in Section 3 as EUT.

This product integrates the pre-certified WWAN module : **Telit GE 865** with FCC ID **RI7GE865 and IC: 5131A-GE865, HW version 3H00**

Taking into account, guidance from FCC KDB 996369 (modular approval) and where relevant test procedures did not change, conducted test results for FCC part 22 and FCC part 24 are leveraged from the test report #RFI-RPT-RP76937JD03B, issued on 2010-09-20, by RFI Global Services Ltd , for FCC/IC certification of the integrated 2G radio module.

# 5 Summary of Measurement Results

**GSM 850 MHz Band:**

| Specifications | Test Case | Temperature and Voltage Conditions | Mode | Pass | Fail | NA | NP | Result |
|---|---|---|---|---|---|---|---|---|
| **§2.1046 §22.913 (b) RSS-GEN, 6.12 RSS-132, 5.4** | RF Output Power | Nominal | GSM 850 | ■ | ☐ | ☐ | ☐ | Complies |
| **RSS-132(5.4)** | Peak-to-average Ratio | Nominal | GSM 850 | ☐ | ☐ | ☐ | ■ | Note 2 |
| **§2.1055 §22.355 RSS-GEN, 6.11 RSS-132 5.3** | Frequency Stability | Extreme | GSM 850 | ☐ | ☐ | ☐ | ■ | Note 1 |
| **§2.1049 §22.917(b) RSS-GEN, 6.6** | Occupied Bandwidth | Nominal | GSM 850 | ☐ | ☐ | ☐ | ■ | Note 1 |
| **§2.1051 §22.917 RSS-GEN, 6.13 RSS-132, 5.5** | Band Edge Compliance | Nominal | GSM 850 | ☐ | ☐ | ☐ | ■ | Note 1 |
| **§2.1053 §22.917 RSS-GEN, 6.1 RSS-132, 5.5** | Unwanted Emissions | Nominal | GSM 850 | ■ | ☐ | ☐ | ☐ | Complies |

**Note**: NA= Not Applicable; NP= Not Performed.
Note 1: Leveraged from module certification.
Note 2: not performed since peak results meet average limits;

**GSM 1900 MHz Band:**

| Specifications | Test Case | Temperature and Voltage Conditions | Mode | Pass | Fail | NA | NP | Result |
|---|---|---|---|---|---|---|---|---|
| **§2.1046 §24.232 (c)(d) RSS-GEN, 6.12 RSS-133, 6.4** | RF Output Power | Nominal | GSM 1900 | ■ | ☐ | ☐ | ☐ | Complies |
| **§24.232 (d) RSS-1RSS-133(6.4)** | Peak-to-average Ratio | Nominal | GSM 1900 | ☐ | ☐ | ☐ | ■ | Note 2 |
| **§2.1055 §24.235 RSS-GEN, 6.11 RSS-133, 6.3** | Frequency Stability | Extreme | GSM 1900 | ☐ | ☐ | ☐ | ■ | Note 1 |
| **§2.1049 RSS-GEN, 6.6** | Occupied Bandwidth | Nominal | GSM 1900 | ☐ | ☐ | ☐ | ■ | Note 1 |
| **§2.1051 §24.238 RSS-GEN, 6.13 RSS-133, 6.5** | Band Edge Compliance | Nominal | GSM 1900 | ☐ | ☐ | ☐ | ■ | Note 1 |
| **§2.1053 §24.238 RSS-GEN, 6.13 RSS-133, 6.5** | Unwanted Emissions | Nominal | GSM 1900 | ■ | ☐ | ☐ | ☐ | Complies |

**Note**: NA= Not Applicable; NP= Not Performed
Note 1: Leveraged from module certification.
Note 2: not performed since peak results meet average limits;

# 6 Measurements

## 6.1 RF Power Output and Effective Radiated Power / Effective Isotropic Radiated Power

### 6.1.1 References

FCC: CFR Part 2.1046, CFR Part 22.913, CFR Part 24.232.
IC: RSS-Gen Section 6.12; RSS-132 Section 5.4; RSS-133 Section 6.4.

### 6.1.2 Limits:

**850 MHz Band:**

**FCC: Peak ERP < 38.45 dBm (7W)**

**IC: Average EIRP < 40.60 dBm (11.5W), PAPR < 13dBm**

**1900 MHz Band**

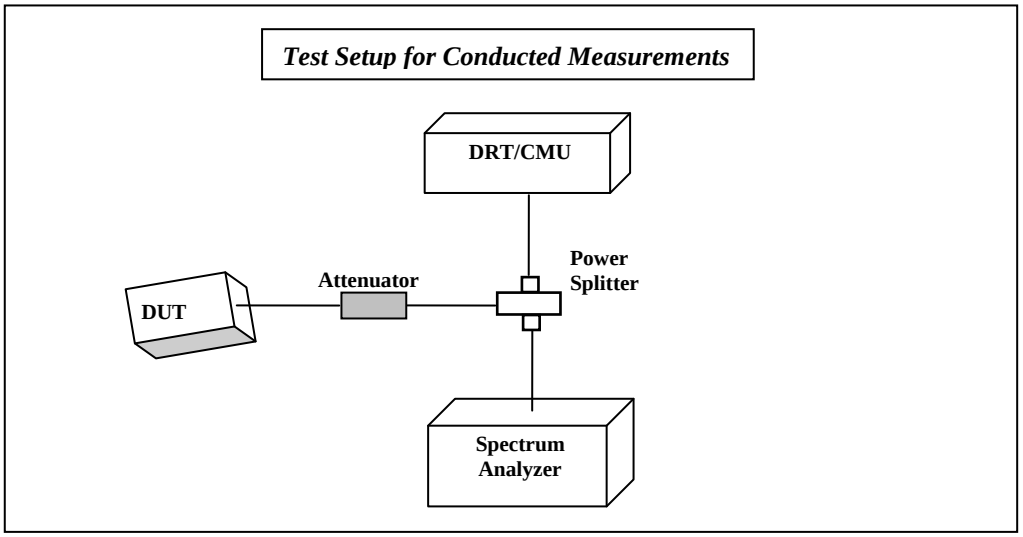
FCC Part 24.232 (c) (e) & RSS-133 Section 6.4/SRSP-510 Section 5.1.2

**FCC: peak EIRP < 33 dBm (2W), if measured as rms (avg): PAPR < 13dBm**

**IC: Average EIRP < 33 dBm (2W), PAPR < 13dBm**

### 6.1.3 Measurement Procedure:

Measurement according to KDB 971168 D01v02r02 (Measurement guidance for certification of Licensed Digital Transmitters)
Section 5.1.1 for peak power
Section 5.2.2 for average power




1. Connect the equipment as shown in the above diagram. A Digital Radio Communication Tester (DRT: R&S CMU200 here) is used to enable the EUT to transmit and to measure the output power.
2. Adjust the settings of the CMU200 to set the EUT to its maximum power at the required channel.
3. Record the Peak and Average Output power level measured by the CMU200.
4. Correct the measured level for all losses in the RF path.
5. Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band and for all types of modulation schemes.
6. GMSK mode measurements are performed in GSM 1 uplink slot configuration.

**Measurement Uncertainty**

+/- 0.5 dB

**Test Conditions:**

Tnom: 22$^{o}$C; Vnom: 3.85 V

### 6.1.4 Measurement Results

### 6.1.5 Conducted Power Verification:

**GPRS 850**

| Channel No. | Frequency (MHz) | Pre-Certified Module | Conducted Output Power Measurement Verification |
|---|---|---|---|
| | | Peak Power (dBm) | Peak Power (dBm) |
| **128** | **824.2** | 31.7 | 32.1 |
| **190** | **836.4** | 31.5 | 32.0 |
| **251** | **848.8** | 31.6 | 32.0 |

**GPRS 1900**

| Channel No. | Frequency (MHz) | Pre-Certified Module | Conducted Output Power Measurement Verification |
|---|---|---|---|
| | | Peak Power (dBm) | Peak Power (dBm) |
| **512** | **1850.2** | 29.4 | 29.8 |
| **660** | **1880** | 29 | 29.5 |
| **810** | **1909.8** | 28.8 | 29.4 |

**Verification Result:**
All measured results remain within the manufacturing tolerance and measurement uncertainty.

### 6.1.6 RF Output Power Test Results:

**ERP/EIRP 850 MHz band**

| **GPRS 850: GMSK Mode<br>Antenna Gain = -2.2 dBi**<br>FCC: Peak ERP < 38.45 dBm (7W)<br>IC: Average EIRP < 40.60 dBm (11.5W) | | | | | |
|---|---|---|---|---|---|
| **Frequency** | **PEAK Conducted Output Power** | **Average Conducted Output Power** | **Calculated Peak EIRP** EIRP = Conducted + gain | **Calculated Peak ERP** (ERP = EIRP - 2.15 dB) | **Calculated Average EIRP** Avg EIRP = Conducted + gain |
| **(MHz)** | **(dBm)** | **(dBm)** | **(dBm)** | **(dBm)** | **(dBm)** |
| **824.2(128)** | 32.1 | 32 | 29.9 | 27.75 | 29.8 |
| **836.6(190)** | 32 | 31.9 | 29.8 | 27.65 | 29.7 |
| **848.8(251)** | 32 | 31.9 | 29.8 | 27.65 | 29.7 |

**EIRP 1900 MHz band**

| **GPRS 1900: GMSK Mode<br>Antenna Gain = 3.2 dBi**<br>FCC: Peak EIRP < 33 dBm (2W)<br>IC: Average EIRP < 33 dBm (2W) | | | | |
|---|---|---|---|---|
| **Frequency** | **PEAK Conducted Output Power** | **Average Conducted Output Power** | **Calculated Peak EIRP** | **Calculated Average EIRP** |
| **(MHz)** | **(dBm)** | **(dBm)** | **(dBm)** | **(dBm)** |
| **1850.2 (512)** | 29.8 | 29.7 | 33 | 32.9 |
| **1880 (660)** | 29.5 | 29.3 | 32.7 | 32.5 |
| **1909.8 (810)** | 29.4 | 29.2 | 32.6 | 32.4 |

note: peak EIRP results meet RSS-132 and RSS-133 average EIRP limits thus no peak to average power ratio (PAPR) values listed.

### 6.1.7 Measurement Verdict:

Pass

## 6.2 Spurious Emissions Radiated

### 6.2.1 References

FCC: CFR Part 2.1053, CFR Part 22.917, CFR Part 24.238.
IC: RSS-Gen Section 6.13; RSS-132 Section 5.5; RSS-133 Section 6.5.

### 6.2.2 Measurement requirements:

**FCC 2.1053: Field strength of spurious radiation.**

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.

**RSS-Gen 6.13: Transmitter unwanted spurious emissions**

The measurement method shall be described in the test report. When the applicable unwanted emissions limits are defined in relative terms, the same parameter, peak power or average power, used for the transmitter's output power measurement shall also be used for the unwanted emission measurements.

In measuring unwanted emissions, the spectrum shall be investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz, up to at least the frequency given below:

(a) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
(b) If the equipment operates at or above 10 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

### 6.2.3 Limits:

(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.
For all power levels +30dBm to 0dBm, this becomes a constant specification of -13dBm.

**FCC 22.917 Emission limitations for cellular equipment.**

The rules in this section govern the spectral characteristics of emissions in the Cellular Radiotelephone Service.
(b) *Measurement procedure.* Compliance with these provisions 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 of 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.

**FCC 24.238 Emission limitations for Broadband PCS equipment.**

The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.

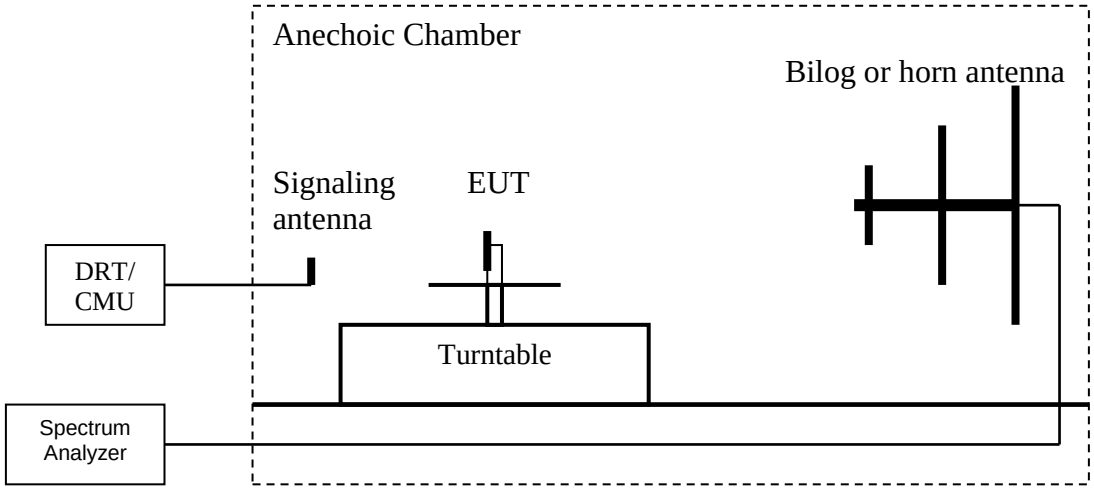
*(b) Measurement procedure.* Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of 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.* 100 kHz of 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.

**RSS-132 Section 5.5.1.1 and RSS-133 Section 6.5.1**

In the first 1.0 MHz band immediately outside and adjacent to the licensee's frequency block, the power of emissions per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in watts) by at least $43 + 10 \log_{10}(P)$, dB. After the first 1.0 MHz, the power of emissions shall be attenuated below the transmitter output power by at least $43 + 10 \log_{10}(P)$, dB, in any 100 kHz bandwidth.
After the first 1.5 MHz, the power of emissions shall be attenuated below the transmitter output power by at least $43 + 10 \log_{10}(P)$, dB, in any MHz of bandwidth.

### 6.2.4 Radiated out of band measurement procedure:

**Ref: TIA-603C 2004- 2.2.12 Unwanted emissions: Radiated Spurious**




Connect the equipment as shown in the above diagram with the EUT's antenna in a horizontal orientation.

Adjust the settings of the Digital Radio Communication Tester (DRT) to set the EUT to its maximum power at the required channel.

Set the spectrum analyzer to measure peak hold with the required settings.

Place the measurement antenna in a horizontal orientation. Rotate the EUT 360°. Raise the measurement antenna up to 4 meters in 0.5 meters increments and rotate the EUT 360° at each height to maximize all emissions. Measure and record all spurious emissions (**LVL**) up to the tenth harmonic of the carrier frequency.

Replace the EUT with a horizontally polarized half wave dipole or known gain antenna. The center of the antenna should be at the same location as the center of the EUT's antenna.

Connect the antenna to a signal generator with known output power and record the path loss in dB (**LOSS)**. **LOSS** = Generator Output Power (dBm) – Analyzer reading (dBm).

Determine the level of spurious emissions using the following equation:

**Spurious** (dBm) = **LVL** (dBm) + **LOSS** (dB):

Repeat steps 4, 5 and 6 with all antennas vertically polarized.

Determine the level of spurious emissions using the following equation:

**Spurious** (dBm) = **LVL** (dBm) + **LOSS** (dB):

Measurements are to be performed with the EUT set to the low, middle and high channel of each frequency band.

(N**ote:** Steps 5 and 6 above are performed prior to testing and **LOSS** is recorded by test software. Steps 3, 4 and 7 above are performed with test software.)

### 6.2.5 Sample Calculations for Radiated Measurements

**Power Measurements using Substitution Procedure:**

The measurement on the Spectrum Analyzer is used as a basis for the Substitution procedure.
The EUT is replaced with a Signal Generator and an antenna. The setting on the Signal Generator is varied until the Spectrum Analyzer displays the original reading. EIRP is calculated as-

EIRP (dBm)= Signal Generator setting (dBm)- Cable Loss (dB)+ Antenna Gain (dBi)

Example:

| Frequency (MHz) | Measured SA (dBµV) | Signal Generator setting (dBm) | Antenna Gain (dBi) | Dipole Gain (dBd) | Cable Loss (dB) | EIRP (dBm) |
|---|---|---|---|---|---|---|
| 1000 | 95.5 | 24.5 | 6.5 | 0 | 3.5 | 27.5 |

### 6.2.6 Measurement Survey:

The site is constructed in accordance with ANSI C63.4 requirements and is recognized by the FCC to be in compliance for a 3m site. The spectrum is scanned from 9 kHz to the 10$^{th}$ harmonic of the highest frequency generated by the EUT.
Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the 850 MHz, 1700 MHz and 1900 MHz bands of operation.
It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the GSM-850 MHz and the PCS-1900 MHz band into any of the other blocks respectively. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

Radiated emission measurements were made in GMSK (1 uplink slot) and UMTS RMC 12.2k modes. Additional spot checks in mid channel of operation for all modes were performed with the slimmer battery option of the device.

For radiated measurements, all data in this report shows the worst case emissions data between H/V antenna polarizations and for all 3 orthogonal orientations of the EUT.

Unless mentioned otherwise, the emission signals above the limit line in the plots are from the carrier.

### 6.2.7 Test Conditions:

Tnom: 21$^{o}$C; Vnom: 3.8 V

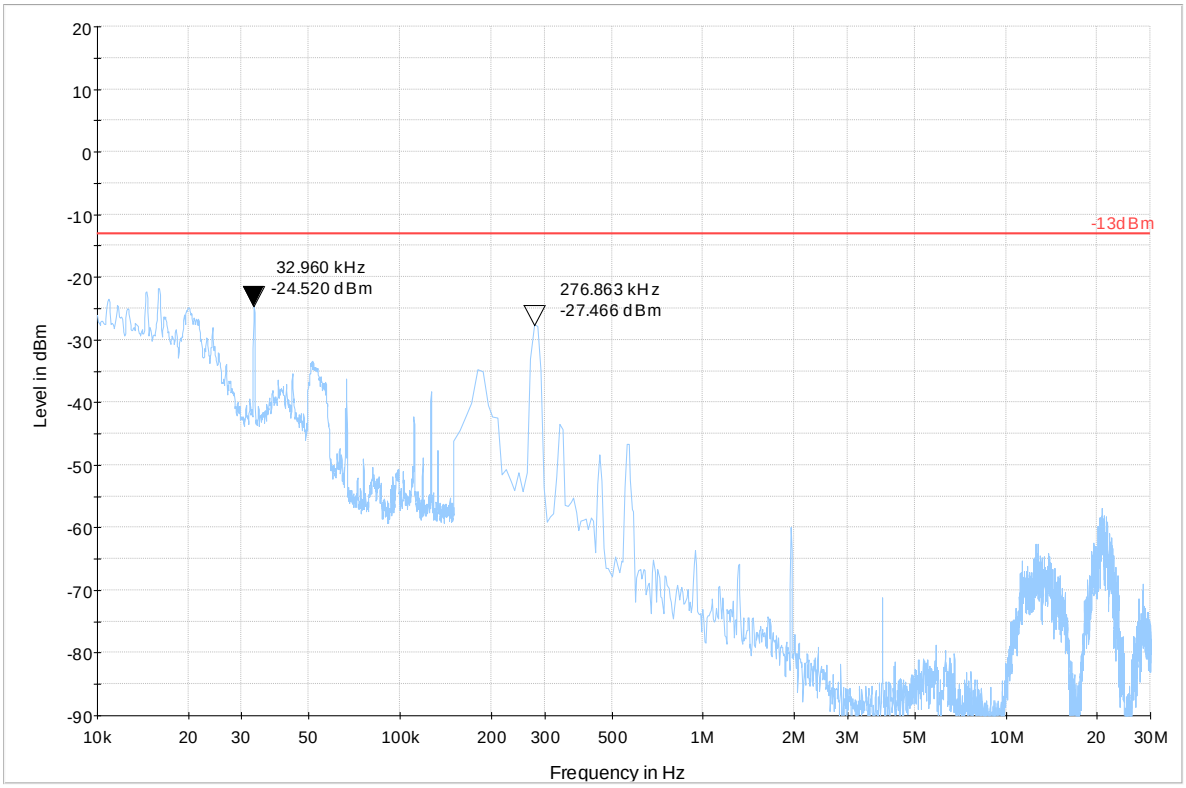
### 6.2.1 Measurement Verdict:

Pass (detailed results see following pages)

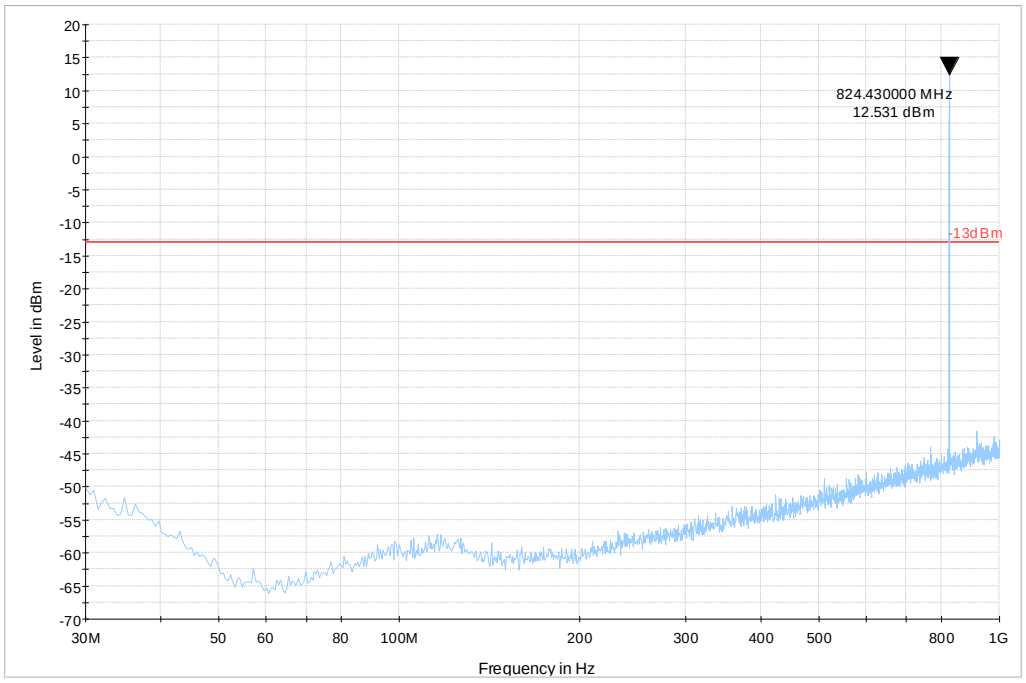
## 6.2.2 Detailed Test Results:

**Radiated Spurious Emissions (GSM850) Tx:**

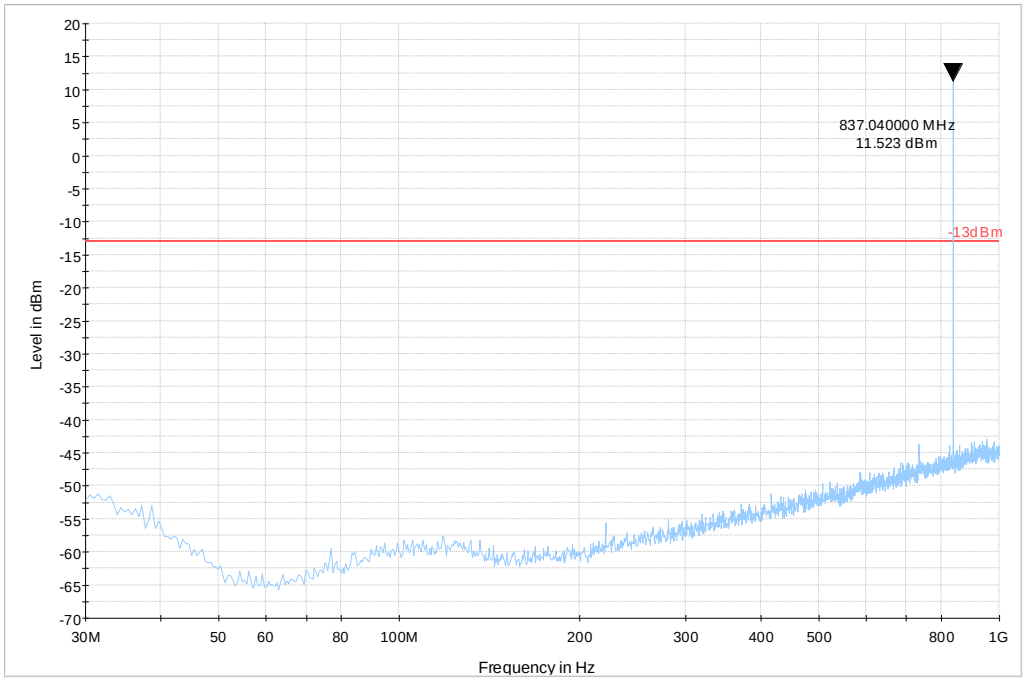
**Test results 10kHz - 30MHz – Mid Channel (GSM850)**



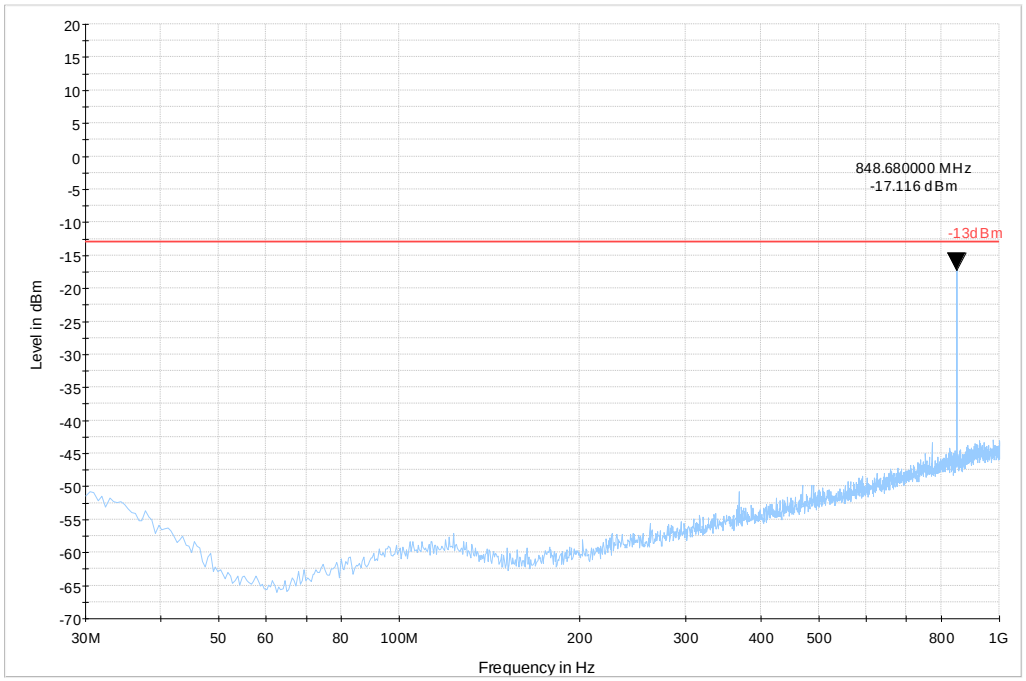
## Test results - 30MHz – 1GHz -Low Channel (GSM850)



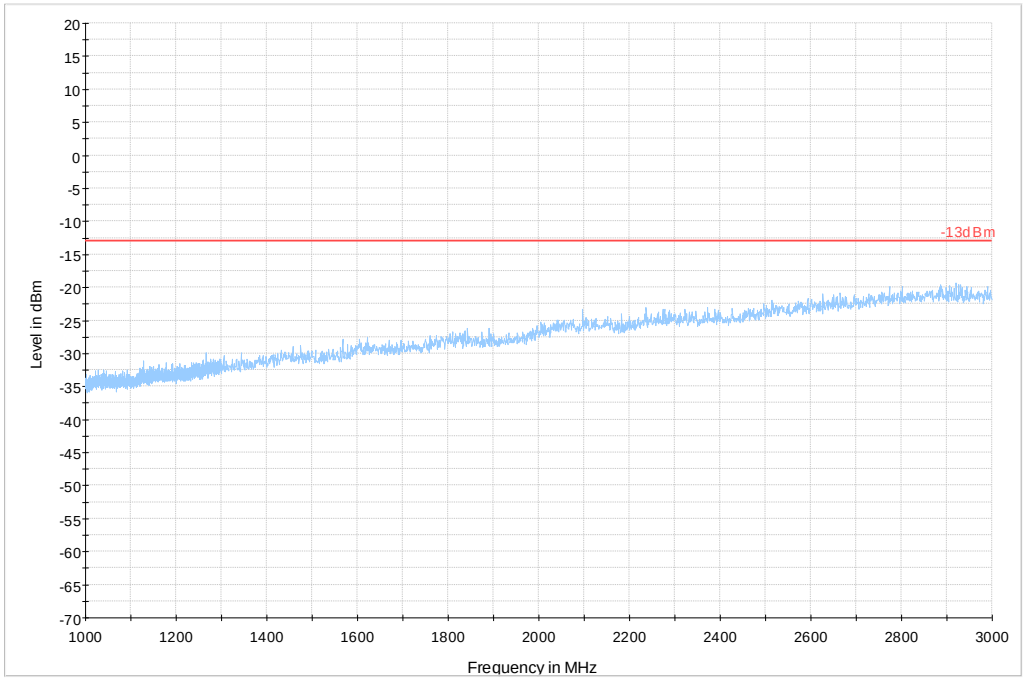

## Test results - 30MHz – 1GHz -Mid Channel (GSM850)



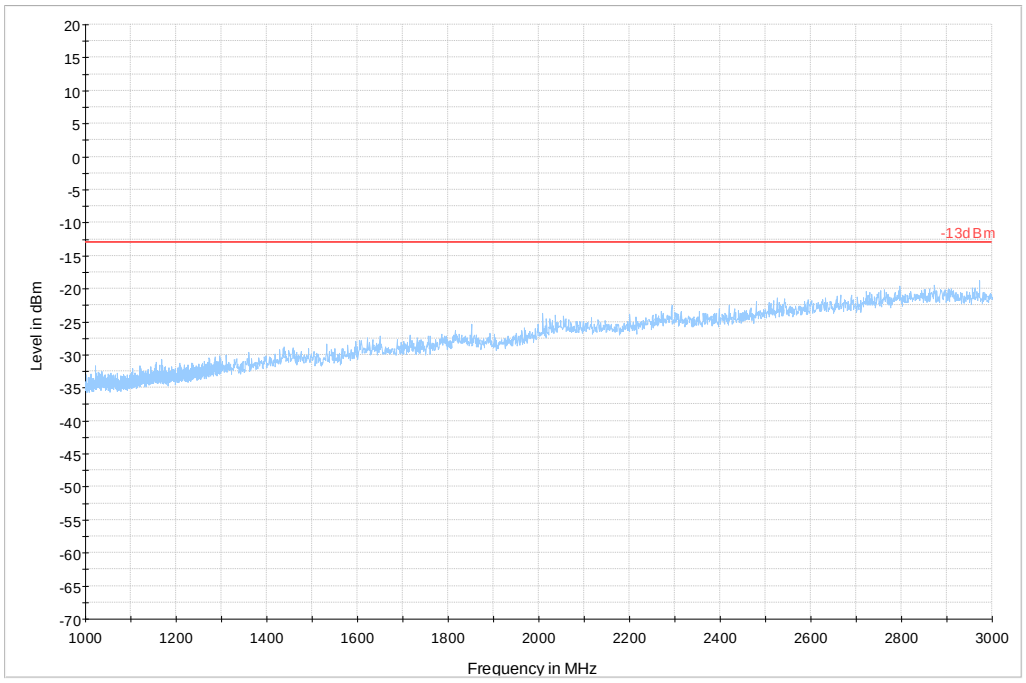
## Test results - 30MHz – 1GHz -High Channel (GSM850)



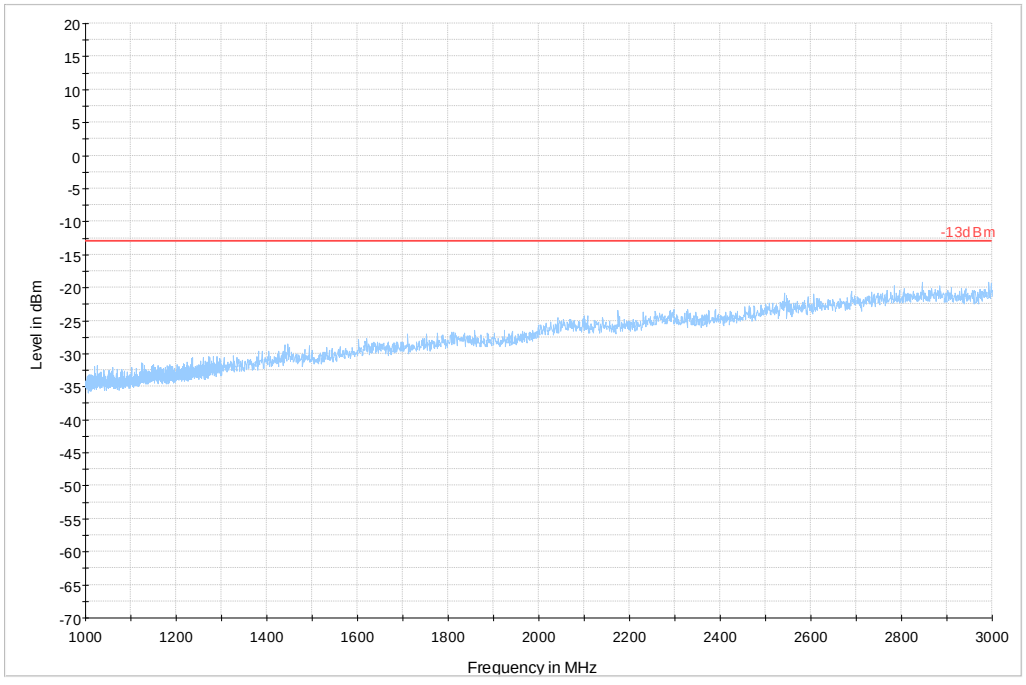

## Test results – 1GHz – 3GHz -Low Channel (GSM850)



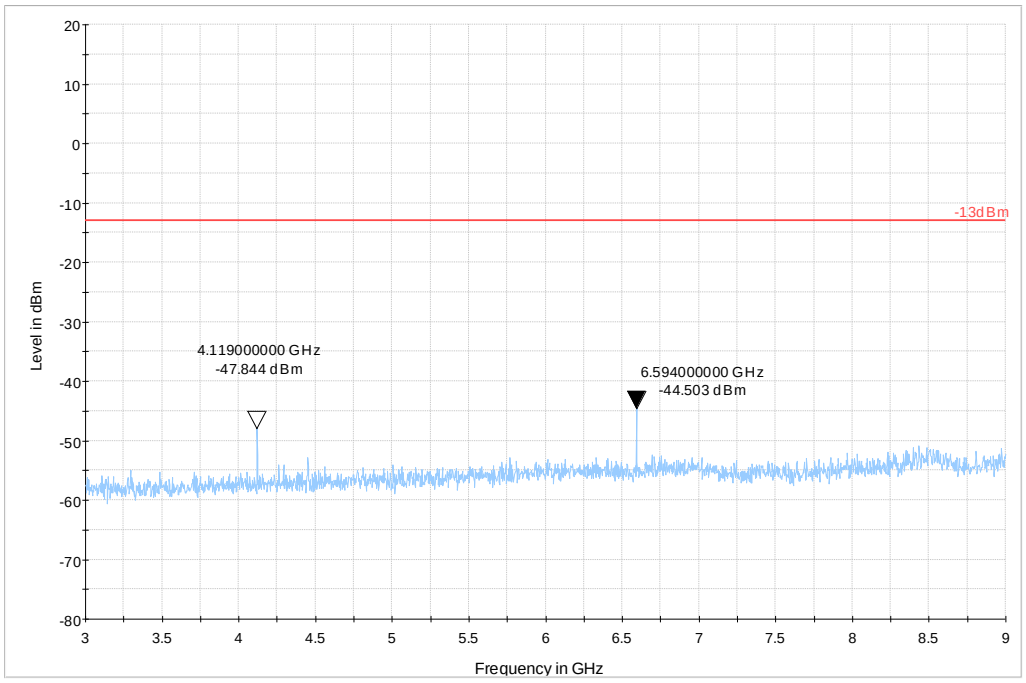
## Test results - 1GHz – 3GHz -Mid Channel (GSM850)



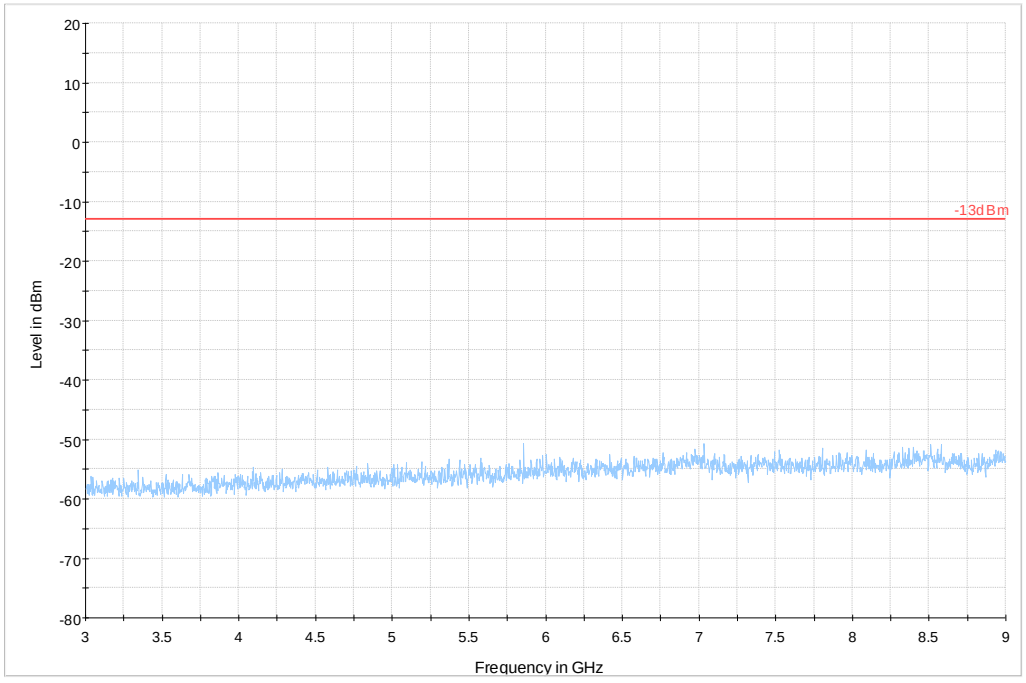

## Test results - 1GHz – 3GHz -High Channel (GSM850)



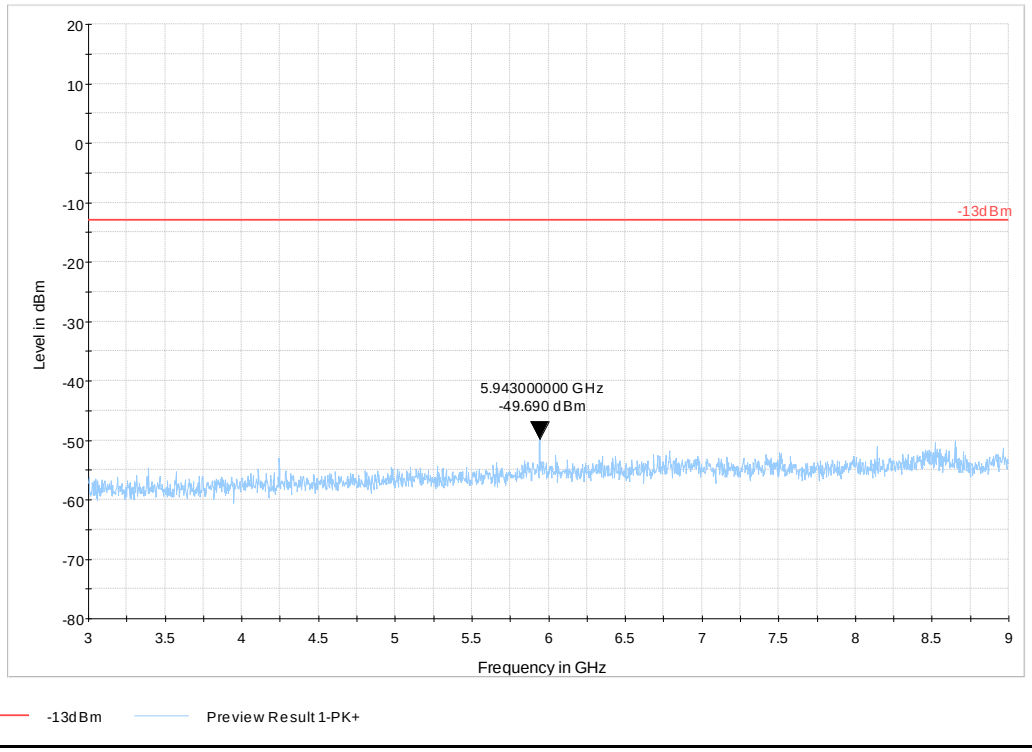
## Test results - 3GHz – 9GHz -Low Channel (GSM850)




## Test results - 3GHz – 9GHz -Mid Channel (GSM850)

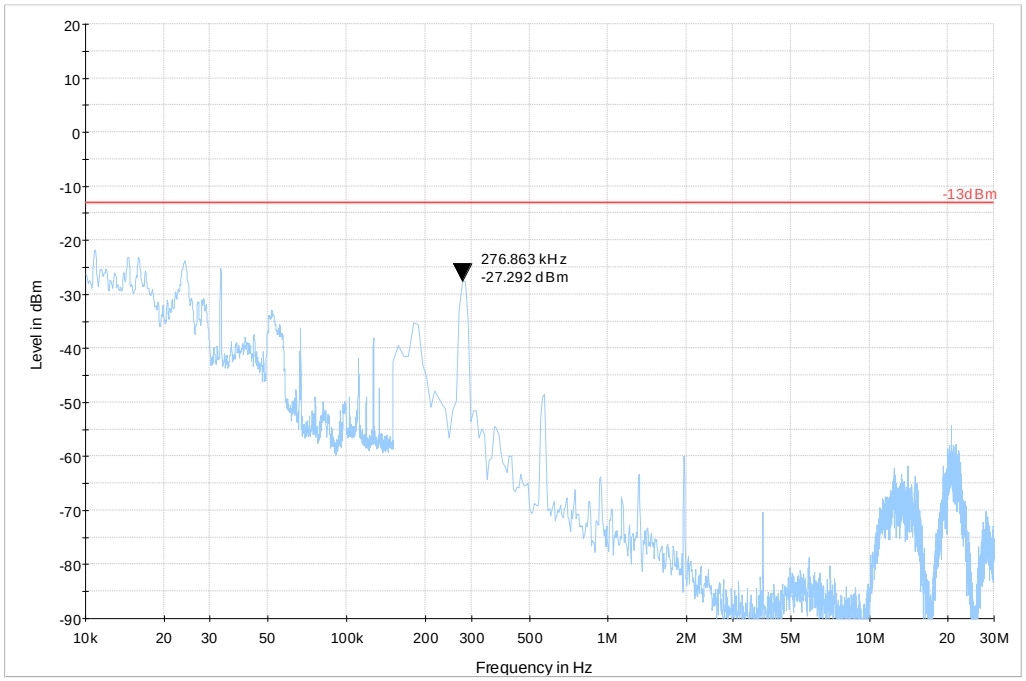


**Test results - 3GHz – 9GHz -High Channel (GSM850)**

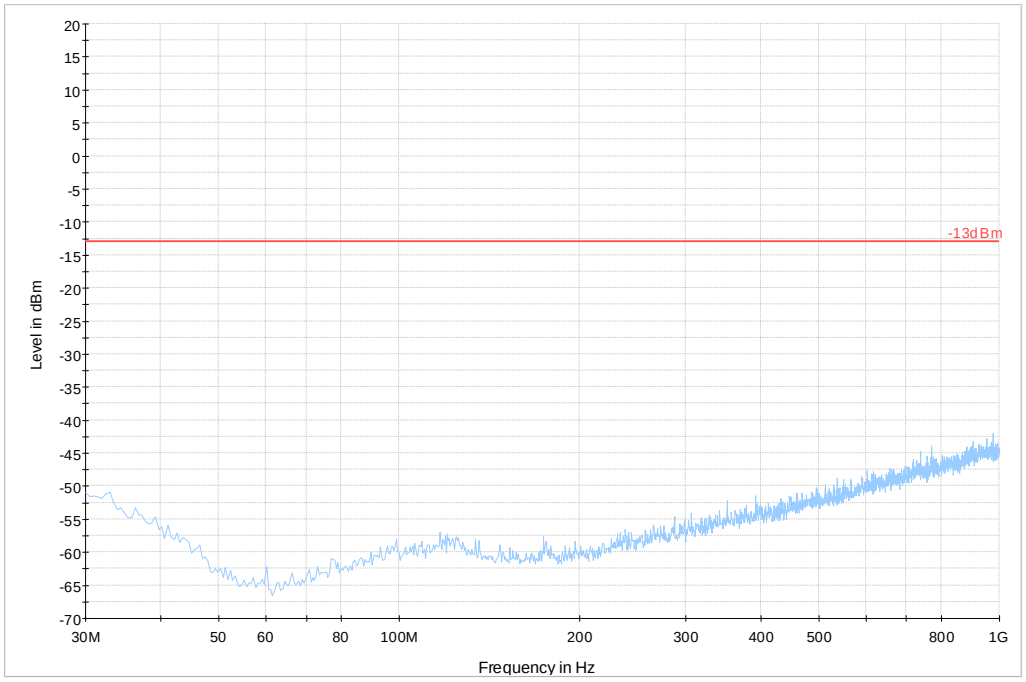


## Radiated Spurious Emissions (GSM-1900) Tx:

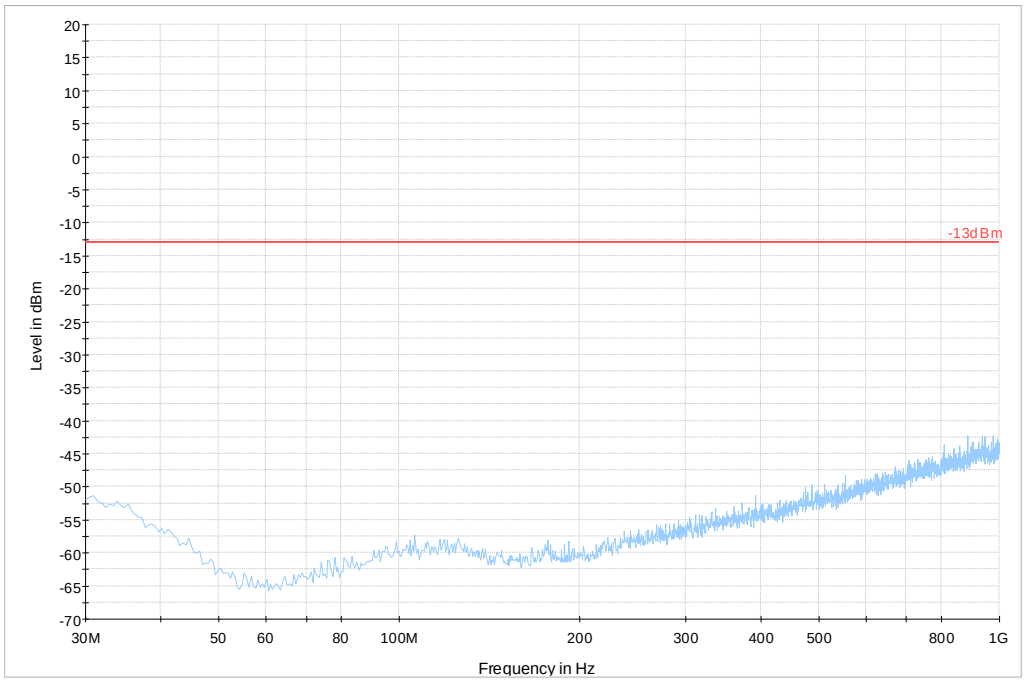
### Test results 10kHz - 30 MHz – Mid Channel (GSM-1900)



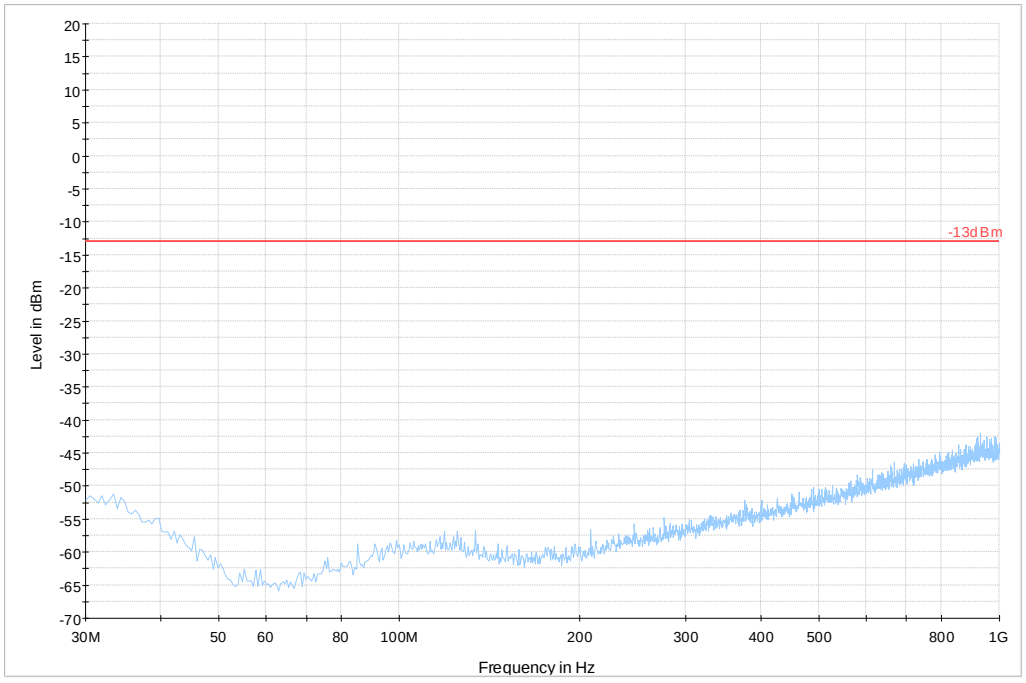

### Test results 30MHz - 1GHz – Low Channel (GSM-1900)



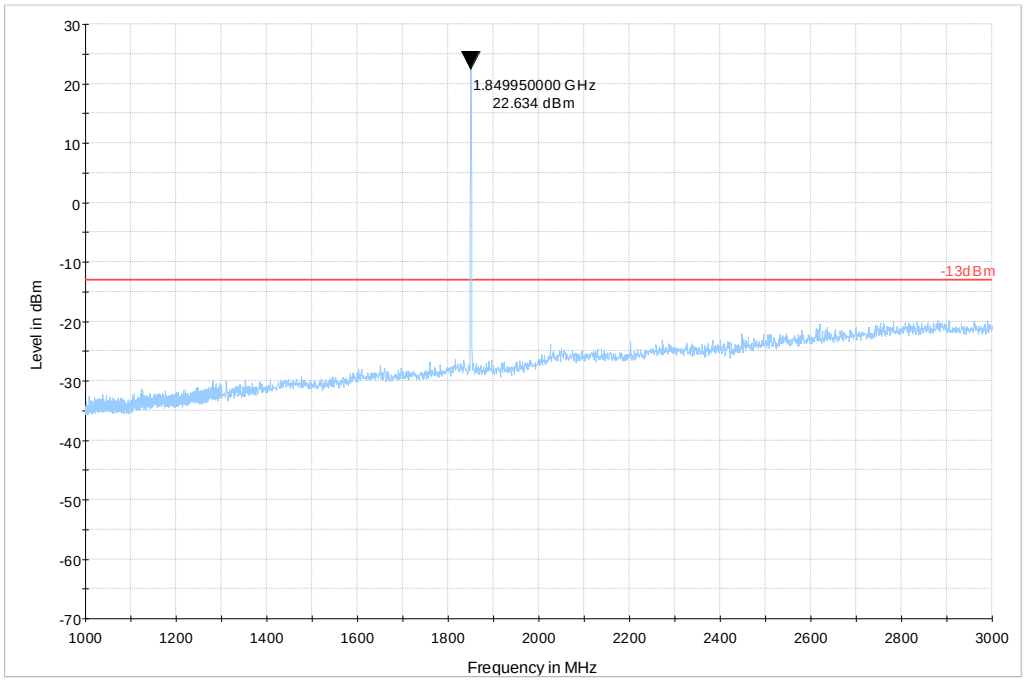
## Test results 30MHz - 1GHz – Mid Channel (GSM-1900)



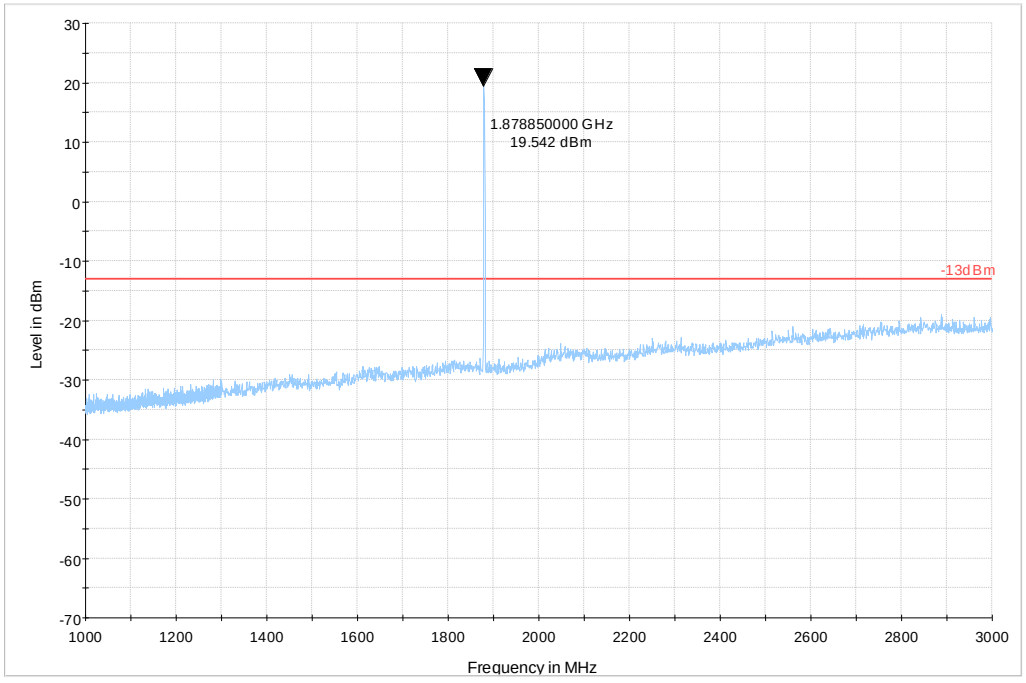

## Test results 30MHz - 1GHz – High Channel (GSM-1900)



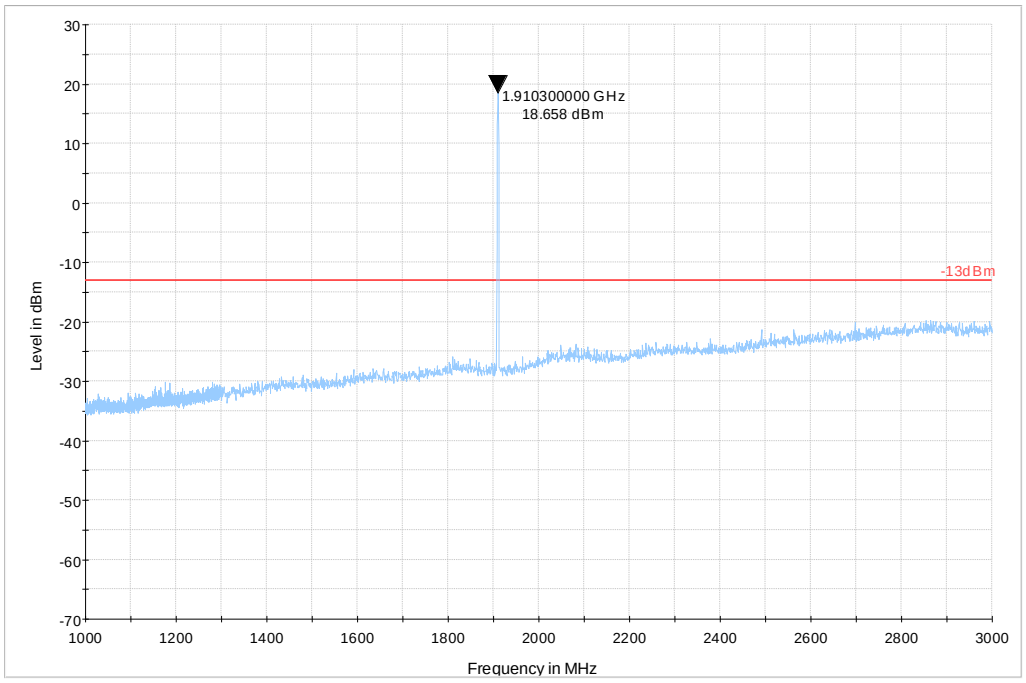
## Test results 1GHz - 3GHz – Low Channel (GSM-1900)



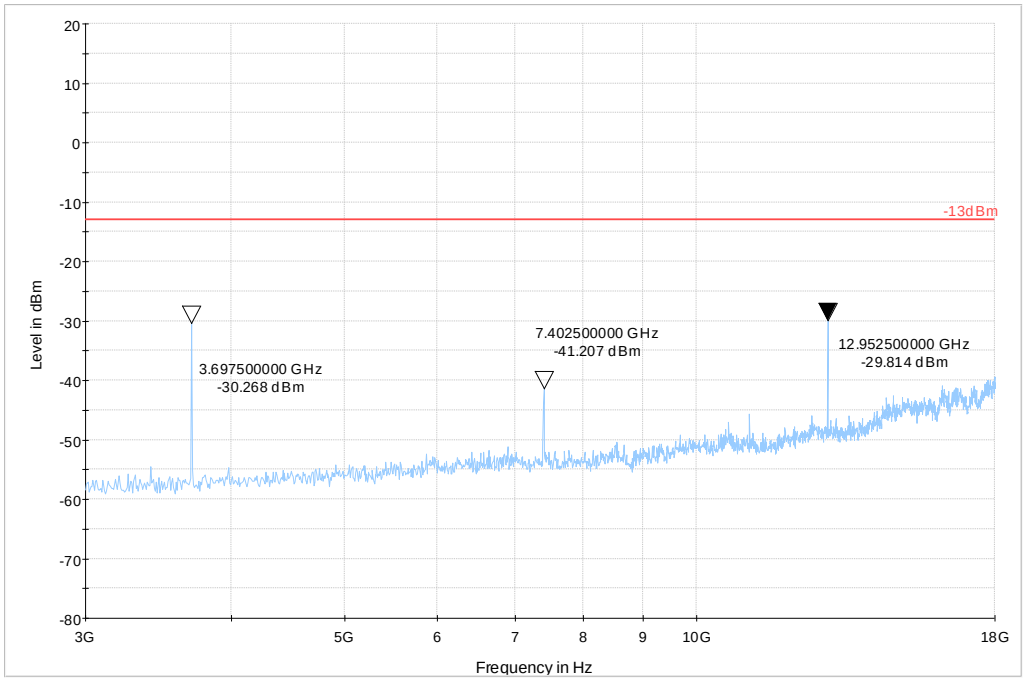

## Test results 1GHz - 3GHz – Mid Channel (GSM-1900)



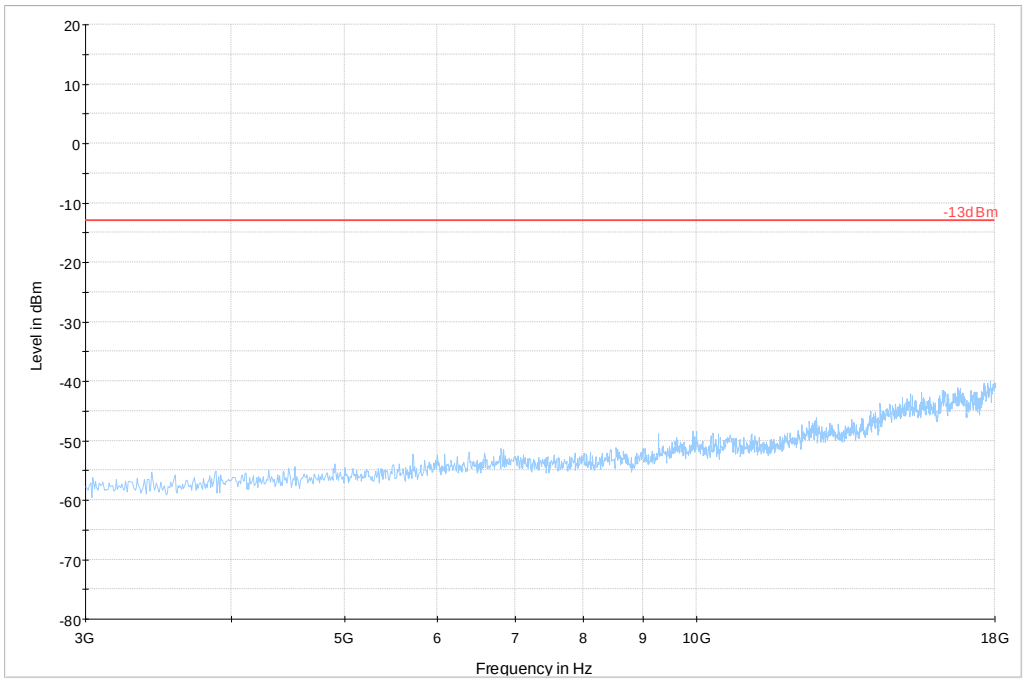
## Test results 1GHz - 3GHz – High Channel (GSM-1900)



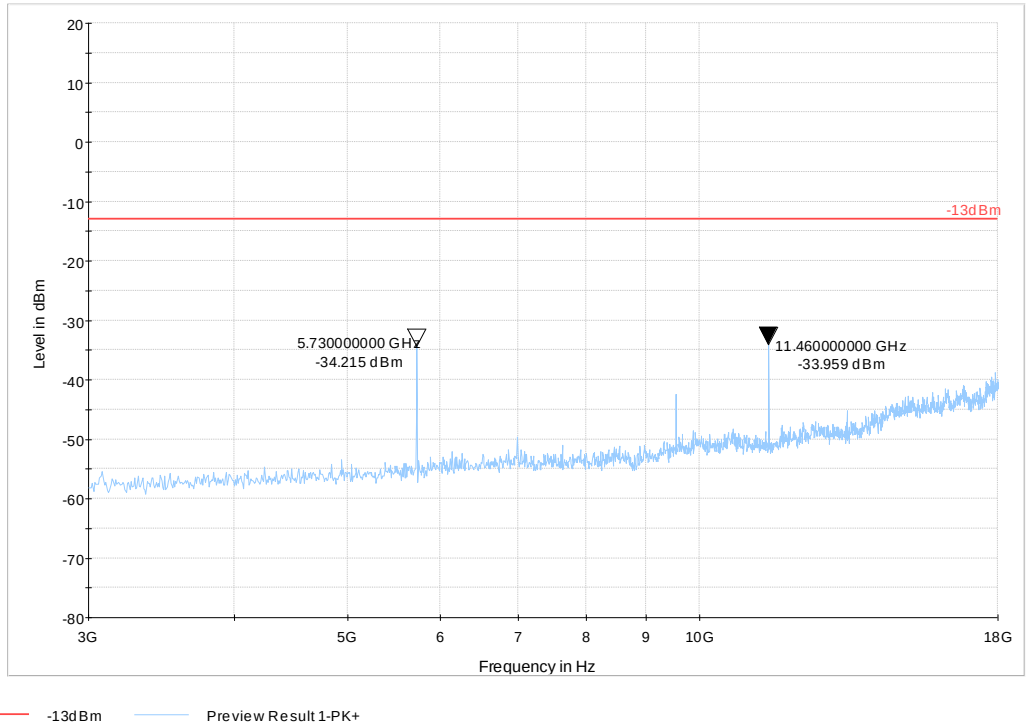

## Test results 3GHz - 18GHz – Low Channel (GSM-1900)



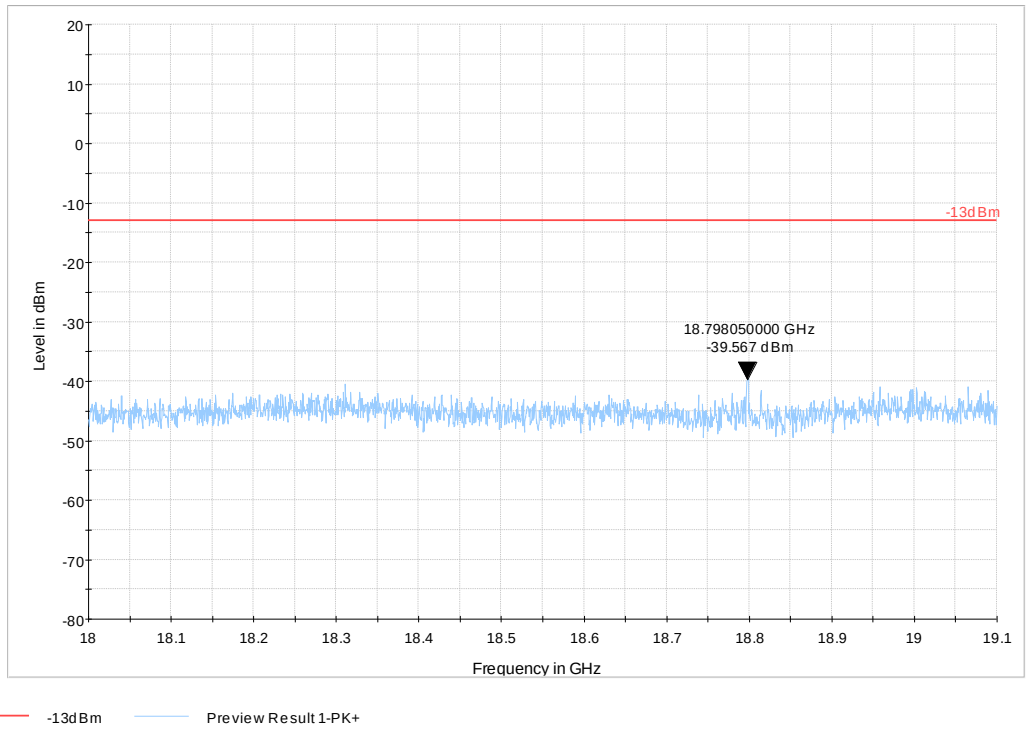
## Test results 3GHz - 18GHz – Mid Channel (GSM-1900)




## Test results 3GHz - 18 GHz – High Channel (GSM-1900)



## Test results 18GHz - 19.1GHz – Mid Channel (GSM-1900)

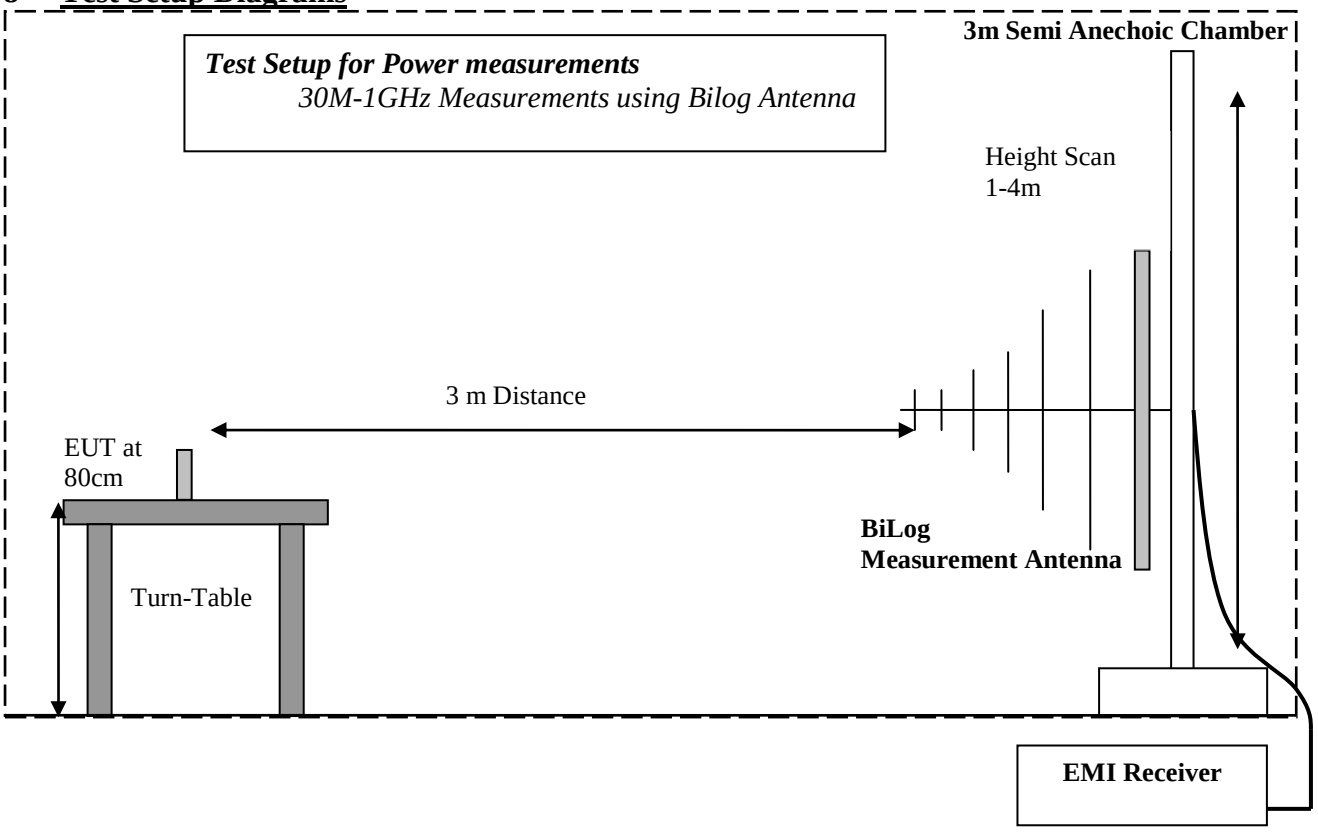


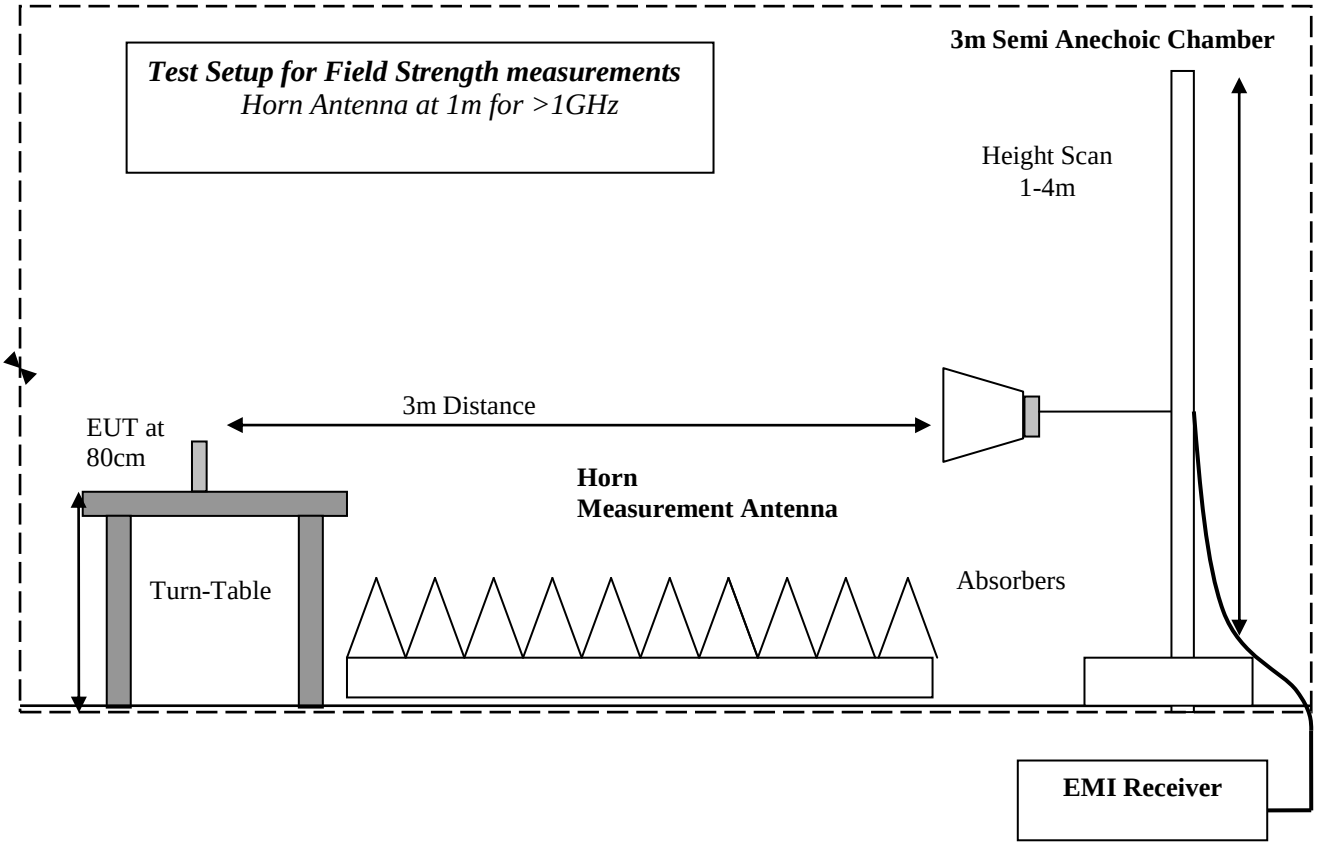
# 7 Test Equipment and Ancillaries used for tests

| Equipment Name | Manufacturer | Type/Model | Serial No. | Cal Date | Cal Interval | Next cal date |
|---|---|---|---|---|---|---|
| **3m Semi- Anechoic Chamber:** | | | | | | |
| Spectrum Analyzer | Rohde und Schwarz | FSU 26 | 200302 | 6/2013 | 2 years | 6/2015 |
| Spectrum Analyzer | Rohde und Schwarz | FSV 40 | 0547 | 7/2014 | 2 years | 7/2016 |
| Receiver | Rohde und Schwarz | ESR3 | 101663 | 2/2013 | 2 years | 2/2015 |
| LISN | Rohde und Schwarz | ESV 216 | 101129 | 1/2013 | 2 years | 1/2015 |
| Radio Communications Tester | Rohde and Schwarz | CMU 200 | 121672 | 7/2013 | 2 years | 7/2015 |
| Log Periodic Antenna | Rohde and Schwarz | HL 050 | 100515 | 4/2013 | 3 year | 4/2016 |
| Ultralog Antenna | Rohde and Schwarz | HL 562 | 100495 | 2/2012 | 3 year | 2/2015 |
| Double-ridge Horn Antenna (1G-18G) | ETS-Lindgren | 3117-PA | 00167061 | 7/2014 | 3 year | 7/2017 |
| Double-ridge Horn Antenna (18G-40G) | ETS-Lindgren | 3116C-PA | 00166821 | 7/2014 | 3 year | 7/2017 |
| Loop Antenna | ETS-Lindgren | 6512 | 00164698 | 7/2014 | 3 year | 7/2017 |
| Open Switch Control Unit | Rohde and Schwarz | OPS 130 | 10085 | n/a | | |
| Extention Unit Open Switch Control Unit | Rohde and Schwarz | OSP 150 | 10086 | n/a | | |
| Turn Table TT | Maturo | 1.5 SI | TT 1.5SI/204/6070910 | n/a | | |
| Compact antenna Mast | Maturo | CAM 4.0-P | CAM4.0-P/067/6000910 | n/a | | |
| Multiple Control Unit | Maturo | MCU | 2140910 | n/a | | |
| Pre-Amplifier | Rohde and Schwarz | TS-PR 18 | 100072 | Part of the system calibration | | |
| High Pass Filter | Mini-Circuits | SHP-1200+ | RUU11201224 | | | |
| High Pass Filter | Wainwright Instr. | WHKX 3.0/18 | 109 | | | |

Calibration status valid at the time of testing.
Equipment used meets the measurement uncertainty requirements as required per applicable standards for 95% confidence levels.
Calibration due dates, unless defined specifically, falls on the last day of the month.
Items indicated “N/A” for cal status either do not specifically require calibration or is internally characterized before use.

## 8 Test Setup Diagrams



# 9 Revision History

| Date | Report Name | Changes to report | Report prepared by |
|---|---|---|---|
| 2015-1-20 | EMC_GTXCO_001_14001_FCC22_24_WWAN | V1 | M.Anees |
| 2015-5-26 | EMC_GTXCO_001_14001_FCC22_24_WWAN | V1.1 | MPDL |
| 2015-6-18 | EMC_GTXCO_001_14001_FCC22_24_WWAN | V1.2 | AMP |