



# **FCC RF Test Report**

**Product Name: UMTS/GPRS/GSM/EDGE Mobile Phone with  
Bluetooth**

**Model Number: U2801-5**

**Report No: SYBH(Z-RF)010032012-2002  
FCC ID: QISU2801-5**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

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## Notice

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2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
3. The laboratory has been listed by industry Canada to perform electromagnetic emission measurement. The site recognition number is 6369A-2.
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# 1 General Information

## 1.1 Applied Standard

Applied Rules: 47 CFR FCC Part 2:2010, Subpart J  
47 CFR FCC Part 24:2010, Subpart E  
ANSI/TIA 603C:2004

## 1.2 Test Location

Test Location 1: Reliability Laboratory of Huawei Technologies Co., Ltd.  
Address: Huawei Base, Bantian, Longgang District, Shenzhen 518129, P.R.  
China

## 1.3 Test Environment Condition

Ambient Temperature: 20 – 25 °C  
Ambient Relative Humidity: 45 – 55 %  
Atmospheric Pressure: 101 kPa

## 2 Test Summary

| PCS Band                               |                 |                                                                                                                                               |        |
|----------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Test Case                              | FCC Part No.    | Requirements                                                                                                                                  | Result |
| Transmitter Output Power               | 2.1046 & 24.232 | Peak EIRP not exceed 2 W                                                                                                                      | Pass   |
| Modulation Characteristics             | 2.1047          | Digital modulation                                                                                                                            | Pass   |
| Occupied Bandwidth                     | 2.1049          | (Not specified)                                                                                                                               | Pass   |
| Band Edges Compliance                  | 2.1051 & 24.238 | Below -13 dBm/1%*EBW, in 1 MHz range                                                                                                          | Pass   |
| Spurious Emission at Antenna Terminals | 2.1051 & 24.238 | Below -13 dBm/1 kHz, 9 kHz to 150 kHz<br>Below -13 dBm/10 kHz, 150 kHz to 30 MHz<br>Below -13 dBm/1 MHz, 30 MHz to 10 <sup>th</sup> harmonics | Pass   |
| Field Strength of Spurious Radiation   | 2.1053 & 24.238 | Below -13 dBm/1 MHz                                                                                                                           | Pass   |
| Frequency Stability                    | 2.1055 & 24.235 | Stay within the authorized frequency block                                                                                                    | Pass   |

## 3 Product Description

### 3.1 Production Information

#### 3.1.1 General Description

UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth U2801-5 is subscriber equipment in the WCDMA/GSM system. The UMTS frequency band is Band V and Band II. The GSM/GPRS/EDGE frequency band includes GSM850 and DCS1800 and PCS1900, but only BAND II and PCS1900 test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, UMTS and GSM/GPRS/EDGE protocol processing, voice, MMS service, GPS etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and USIM card interface. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

#### 3.1.2 Board

Board Information

| UMTS/GPRS/GSM/EDGE Mobile Phone with Bluetooth |                  |                  |
|------------------------------------------------|------------------|------------------|
| U2801-5                                        |                  |                  |
| Hardware Version                               | Software Version | Serial Number    |
| Ver.C                                          | U2801C32B102     | N6S2A11162500008 |

#### 3.1.3 Sub-Assembly

|                      |                       |                                     |
|----------------------|-----------------------|-------------------------------------|
| AC/DC Adapter Model: | HS-050040U6(02130875) | HS-050040U6(02130875)               |
| Manufacturer:        | BYD (HUIZHOU) CO.,LTD | SHENZHEN HUNTKEY ELECTRIC CO., LTD. |
| Input Voltage:       | ~ 100-240V 50/60Hz    | ~ 100-240V 50/60Hz                  |
| Output Voltage;      | == 5.0 V              | == 5.0 V                            |
| Rated Power:         | 2W                    | 2W                                  |

#### 3.1.4 Battery Technical Data

| Name                | Manufacture                   | Description                                                                                                          |
|---------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Rechargeable Li-ion | Huawei Technologies Co., Ltd. | Battery Model: HB5A2(24020752)<br>Rated capacity: 1000mAh<br>Nominal Voltage: == +3.7V<br>Charging Voltage: == +4.2V |

## 3.2 Test Description

### 3.2.1 Supported Frequency Range

| Characteristics | Description      |
|-----------------|------------------|
| Downlink        | 1930 to 1990 MHz |
| Uplink          | 1850 to 1910MHz  |

### 3.2.2 Transmitter / Receiver Characteristics

| Characteristics                    | Description                                                                                  |
|------------------------------------|----------------------------------------------------------------------------------------------|
| System Type                        | GSM<br>UMTS                                                                                  |
| TX Output Power (per Antenna Port) | GSM system: 33dBm<br>UMTS system: 24dBm;                                                     |
| Channel Spacing(s) / Bandwidth(s)  | GSM system: 200 kHz<br>UMTS system: 5 MHz                                                    |
| Designation of Emissions           | GSM system: 247KGXW (GMSK modulation),<br>246KG7W (8PSK modulation))<br>UMTS system: 4M17F9W |

### 3.2.3 Antenna Gain

|                    |     |
|--------------------|-----|
| Antenna Gain(dBi): | 1.5 |
|--------------------|-----|

### 3.2.4 Power Supply

|                             | Description                                                                |
|-----------------------------|----------------------------------------------------------------------------|
| Power Supply Type           | Directly Connected to DC /AC Power Supply                                  |
| Input to Adapter (DC power) | DC Voltage Nominal: $\pm$ +3.7V<br>DC Voltage Range: $\pm$ +3.6 V to +4.2V |

## 4 General Test Conditions / Configurations

### 4.1 RF Channels under Test

| Test Mode | TX / RX | RF Channel   |              |              |
|-----------|---------|--------------|--------------|--------------|
|           |         | Bottom (B)   | Middle (M)   | Top (T)      |
| TM1/TM2   | TX      | Channel 512  | Channel 661  | Channel 810  |
|           |         | 1850.2MHz    | 1880.0MHz    | 1909.8MHz    |
|           | RX      | Channel 512  | Channel 661  | Channel 810  |
|           |         | 1930.2 MHz   | 1960.0 MHz   | 1989.8 MHz   |
| TM3       | TX      | Channel 9262 | Channel 9400 | Channel 9538 |
|           |         | 1852.4MHz    | 1880.0MHz    | 1907.6MHz    |
|           | RX      | Channel 9662 | Channel 9800 | Channel 9938 |
|           |         | 1932.4 MHz   | 1960.0 MHz   | 1987.6 MHz   |

### 4.2 Test Modes

| Test Mode | Test Modes Description    |
|-----------|---------------------------|
| TM1       | GSM/GPRS, GMSK modulation |
| TM2       | EDGE, 8PSK modulation     |
| TM3       | WCDMA QPSK modulation     |

### 4.3 Test Environments

| Environment Parameter | Selected Values During Tests |         |
|-----------------------|------------------------------|---------|
| Relative Humidity     | Ambient                      |         |
| Temperature           | TN                           | Ambient |
| Voltage               | VL                           | 3.6V    |
|                       | VN                           | 3.7V    |
|                       | VH                           | 4.2V    |

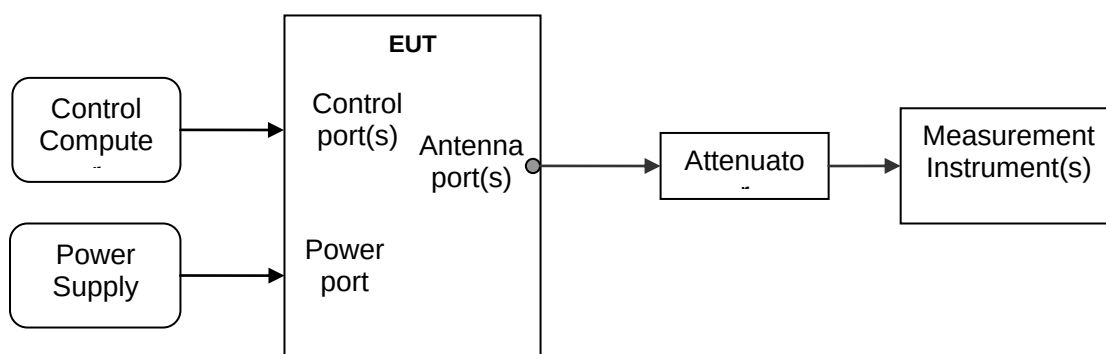
NOTE: VL= lower extreme test voltages  
VN= nominal voltage  
VH= upper extreme test voltage  
TN= nominal temperature

## 4.4 Test Setups

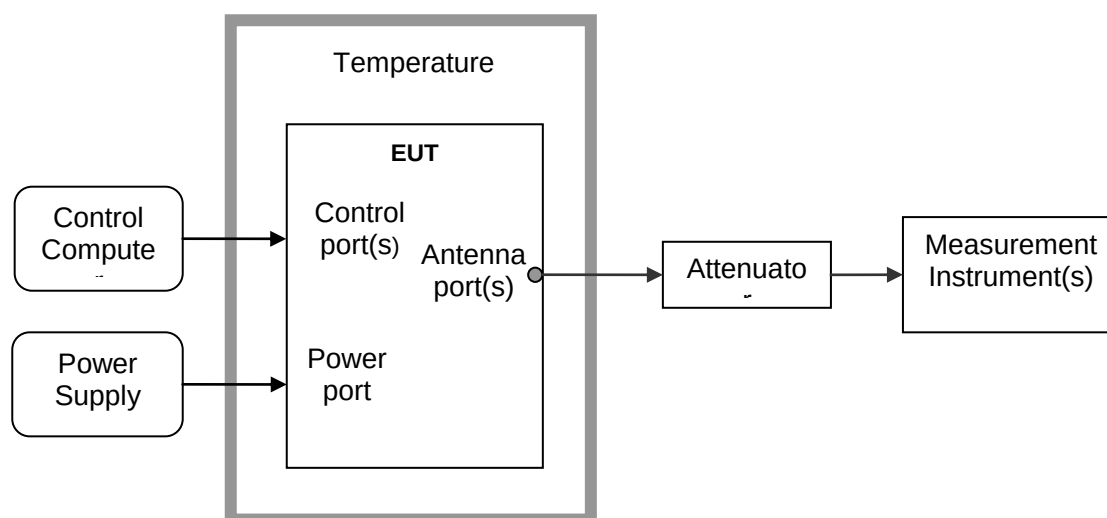
### 4.4.1 General Test Setup Configurations

| Configuration       | Description                                                                                                                                                                                                                                        |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Antenna Ports  | Until otherwise declared, all TX tests are ONLY performed at the main Transmitter antenna port (e.g. TRXA, TXA and so on) of the EUT, and all RX tests are ONLY performed at the main Receiver antenna port (e.g. TRXA, RXA and so on) of the EUT. |
| Multiple RF Sources | Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.                                                                                                                                       |

### 4.4.2 Test Setup 1



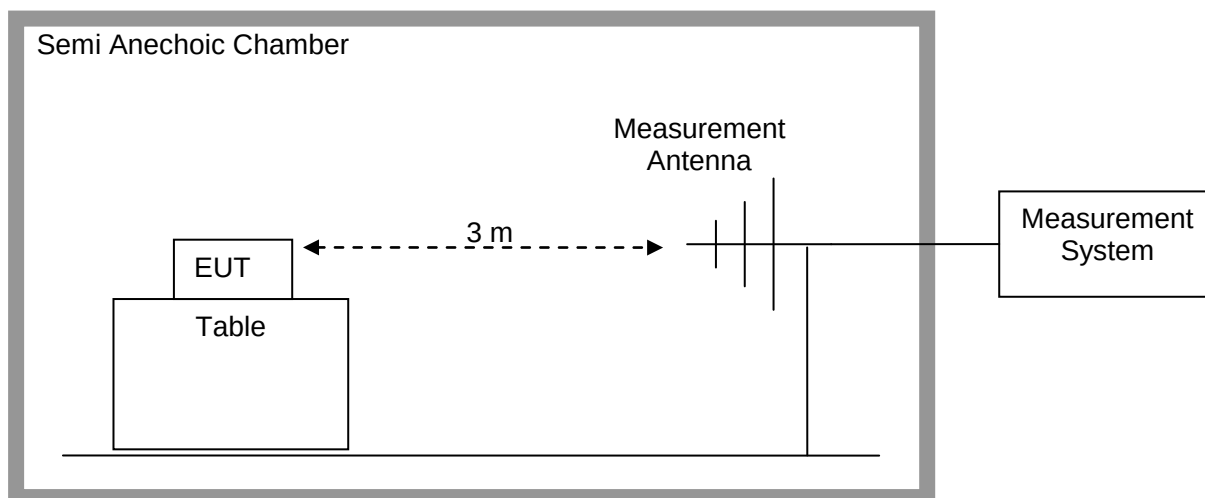
### 4.4.3 Test Setup 2



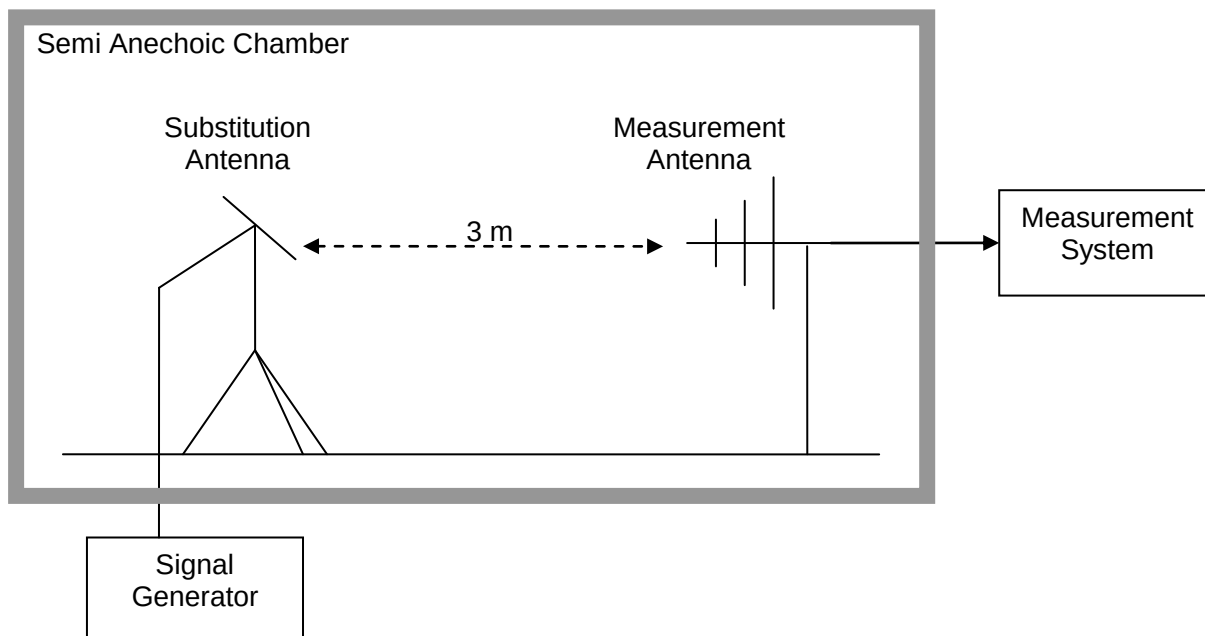
#### 4.4.4 Test Setup 3

NOTE: Effective Isotropic radiated power (EIRP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

##### Step 1: Pre-test



##### Step 2: Substitution method to verify the maximum EIRP



## 4.5 Test Conditions

| Test Case                              | Test Conditions    |                                                                                                                           |
|----------------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------|
| Transmitter Output Power               | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 1/ Setup 3                                                                                                     |
|                                        | Detector           | RMS                                                                                                                       |
|                                        | RF Channels (TX)   | B, M, T                                                                                                                   |
|                                        | Test Mode          | TM1/TM2/TM3                                                                                                               |
| Modulation Characteristics             | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 1                                                                                                              |
|                                        | RF Channels (TX)   | M                                                                                                                         |
|                                        | Test Mode          | TM1/TM2/TM3                                                                                                               |
| Occupied Bandwidth                     | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 1                                                                                                              |
|                                        | Detector           | PK                                                                                                                        |
|                                        | RF Channels (TX)   | B, M, T                                                                                                                   |
|                                        | Test Mode          | TM1/TM2/TM3                                                                                                               |
| Band Edges Compliance                  | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 1                                                                                                              |
|                                        | Detector           | RMS                                                                                                                       |
|                                        | RF Channels (TX)   | B, T                                                                                                                      |
|                                        | Test Mode          | TM1/TM2/TM3                                                                                                               |
| Spurious Emission at Antenna Terminals | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 1                                                                                                              |
|                                        | Detector           | PK                                                                                                                        |
|                                        | RF Channels (TX)   | B, M, T                                                                                                                   |
|                                        | Test Mode          | TM1/TM2/TM3                                                                                                               |
| Field Strength of Spurious Radiation   | Test Configuration | Ambient Temperature & Rated Voltage                                                                                       |
|                                        | Test Setup         | Test Setup 3                                                                                                              |
|                                        | Detector           | PK                                                                                                                        |
|                                        | RF Channels (TX)   | M                                                                                                                         |
|                                        | Test Mode          | TM1/TM2/TM3                                                                                                               |
| Frequency Stability                    | Test Configuration | (1) -30 °C to +50 °C with step 10 °C at Rated Voltage;<br>(2) 85%, 100% and 115% of Rated Voltage at Ambient Temperature. |
|                                        | Test Setup         | Test Setup 2                                                                                                              |
|                                        | RF Channels (TX)   | M                                                                                                                         |



|           |                 |             |
|-----------|-----------------|-------------|
| Test Case | Test Conditions |             |
|           | Test Mode       | TM1/TM2/TM3 |

## 5 Main Test Instruments

Table 1 Main Test Equipments

| Equipment Description                | Manufacturer | Model                   | Serial Number | Calibrated until |
|--------------------------------------|--------------|-------------------------|---------------|------------------|
| Power supply                         | KEITHLEY     | 2303                    | 1288003       | Sep.27,2012      |
| Universal Radio Communication Tester | R&S          | CMU200                  | 117341        | Jan.12.2013      |
| Universal Radio Communication Tester | Agilent      | E5515C                  | MY50260239    | Aug.31,2012      |
| Spectrum Analyzer                    | Agilent      | E4440A                  | MY49420179    | Apr.20,2012      |
| Signal Analyzer                      | R&S          | FSQ31                   | 200021        | Sep.27,2012      |
| Temperature Chamber                  | WEISS        | WKL64                   | 24600294      | Jan.03,2013      |
| Signal generator                     | Agilent      | E8257D                  | MY49281095    | Jul.9.2012       |
| Test receiver                        | R&S          | ESU26                   | 100150        | May.29.2012      |
| Tunable Dipole                       | Schwarzbeck  | D69250-UHAP/D69250-VHAP | 919/1009      | Jan.29.2013      |
| Tunable Dipole                       | Schwarzbeck  | D69250-UHAP/D69250-VHAP | 979/917       | Jan.29.2013      |
| Horn Antenna                         | R & S        | HF906                   | 100683        | May.15, 2012     |
| Horn Antenna                         | R & S        | HF906                   | 100684        | Jul.01, 2012     |
| Broadband Antenna                    | Schwarzbeck  | VULB 9163               | 9163-357      | May.15, 2012     |
| Broadband Antenna                    | Schwarzbeck  | VULB 9163               | 9163-356      | May.15, 2012     |

## 6 Test Results

| No. | Test Item                              | Test Result |
|-----|----------------------------------------|-------------|
| 1   | Transmitter Output Power               | Appendix A  |
| 2   | Modulation Characteristics             | Appendix B  |
| 3   | Occupied Bandwidth                     | Appendix C  |
| 4   | Band Edges Compliance                  | Appendix D  |
| 5   | Spurious Emission at Antenna Terminals | Appendix E  |
| 6   | Field Strength of Spurious Radiation   | Appendix F  |
| 7   | Frequency Stability                    | Appendix G  |
| 8   | Photos of Radiated Spurious Emissions  | Appendix H  |

NOTE: The Appendix H only photos of Radiated Spurious Emissions, no test data.

## 7 Measurement Uncertainty

For a 95% confidence level ( $k=2$ ), the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

| Test Item                            |                          | Extended Uncertainty                               |
|--------------------------------------|--------------------------|----------------------------------------------------|
| Transmitter Output Power             | Power (dBm)              | U =0.39 dB                                         |
| Occupied Bandwidth                   | Magnitude (%)            | U=0.2%                                             |
| Band Edge Compliance                 | Disturbance Power (dBm)  | U=2.0 dB                                           |
| Conducted Spurious Emissions         | Disturbance Power (dBm)  | U=2.0 dB                                           |
| Field Strength of Spurious Radiation | ERP (dBm)                | U=4.6 dB (30 MHz – 1GHz)<br>U=3.0 dB (above 1 GHz) |
| Frequency Stability                  | Frequency Accuracy (ppm) | U=0.21 ppm                                         |

The END



## Appendix A

### Transmitter Output Power According to FCC Part 2.1046 & Part 24 Subpart E



## Conducted Power of Transmitter

Table 1 Measurement Results

| TEST CONDITIONS     | RF Output Power (Conducted) |       |                |       |                |       |
|---------------------|-----------------------------|-------|----------------|-------|----------------|-------|
|                     | Channel512(B)               |       | Channel661(M)  |       | Channel810(T)  |       |
|                     | 1850.2MHz                   |       | 1880.0MHz      |       | 1909.8MHz      |       |
|                     | dBm                         |       | dBm            |       | dBm            |       |
| $T_{nom} / V_{nom}$ | Measured                    | Limit | Measured       | Limit | Measured       | Limit |
| TM1                 | 30.18                       | 33    | 30.32          | 33    | 30.24          | 33    |
| TM2                 | 26.31                       | 33    | 26.44          | 33    | 26.35          | 33    |
|                     |                             |       |                |       |                |       |
| TEST CONDITIONS     | Channel9262(B)              |       | Channel9400(M) |       | Channel9538(T) |       |
|                     | 1852.4MHz                   |       | 1880.0MHz      |       | 1907.6MHz      |       |
|                     | dBm                         |       | dBm            |       | dBm            |       |
| $T_{nom} / V_{nom}$ | Measured                    | Limit | Measured       | Limit | Measured       | Limit |
| TM3                 | 21.78                       | 33    | 21.78          | 33    | 22.14          | 33    |



## Efficient Isotropic Radiated Power(EIRP)

Table 2 Substitution Results

| Test Mode | Freq. [MHz] | Meas. Level [dBm] | Substitution Antenna Type | SGP   | Substitution Gain [dBi] | Cable Loss [dB] | Substitution Level (EIRP) | FCC limit [dBm] | Result |
|-----------|-------------|-------------------|---------------------------|-------|-------------------------|-----------------|---------------------------|-----------------|--------|
|           |             |                   |                           | [dBm] |                         |                 | [dBm]                     |                 |        |
| TM1       | 1850.2      | 31.68             | Horn Ant.                 | 28.12 | 4.5                     | 1               | 31.62                     | 33              | Pass   |
| TM1       | 1880.0      | 31.82             | Horn Ant.                 | 28.30 | 4.5                     | 1               | 31.80                     | 33              | Pass   |
| TM1       | 1909.8      | 31.74             | Horn Ant.                 | 27.97 | 4.8                     | 1               | 31.77                     | 33              | Pass   |
| TM2       | 1850.2      | 27.81             | Horn Ant.                 | 24.38 | 4.5                     | 1               | 27.88                     | 33              | Pass   |
| TM2       | 1880.0      | 27.94             | Horn Ant.                 | 24.44 | 4.5                     | 1               | 27.94                     | 33              | Pass   |
| TM2       | 1909.8      | 27.85             | Horn Ant.                 | 24.05 | 4.8                     | 1               | 27.85                     | 33              | Pass   |
| TM3       | 1852.4      | 23.28             | Horn Ant.                 | 19.72 | 4.5                     | 1               | 23.22                     | 33              | Pass   |
| TM3       | 1880.0      | 23.28             | Horn Ant.                 | 19.71 | 4.5                     | 1               | 23.21                     | 33              | Pass   |
| TM3       | 1907.6      | 23.64             | Horn Ant.                 | 19.80 | 4.8                     | 1               | 23.60                     | 33              | Pass   |

Note: a, For getting the EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should take to calculate it,

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b, SGP=Signal Generator Level

The END



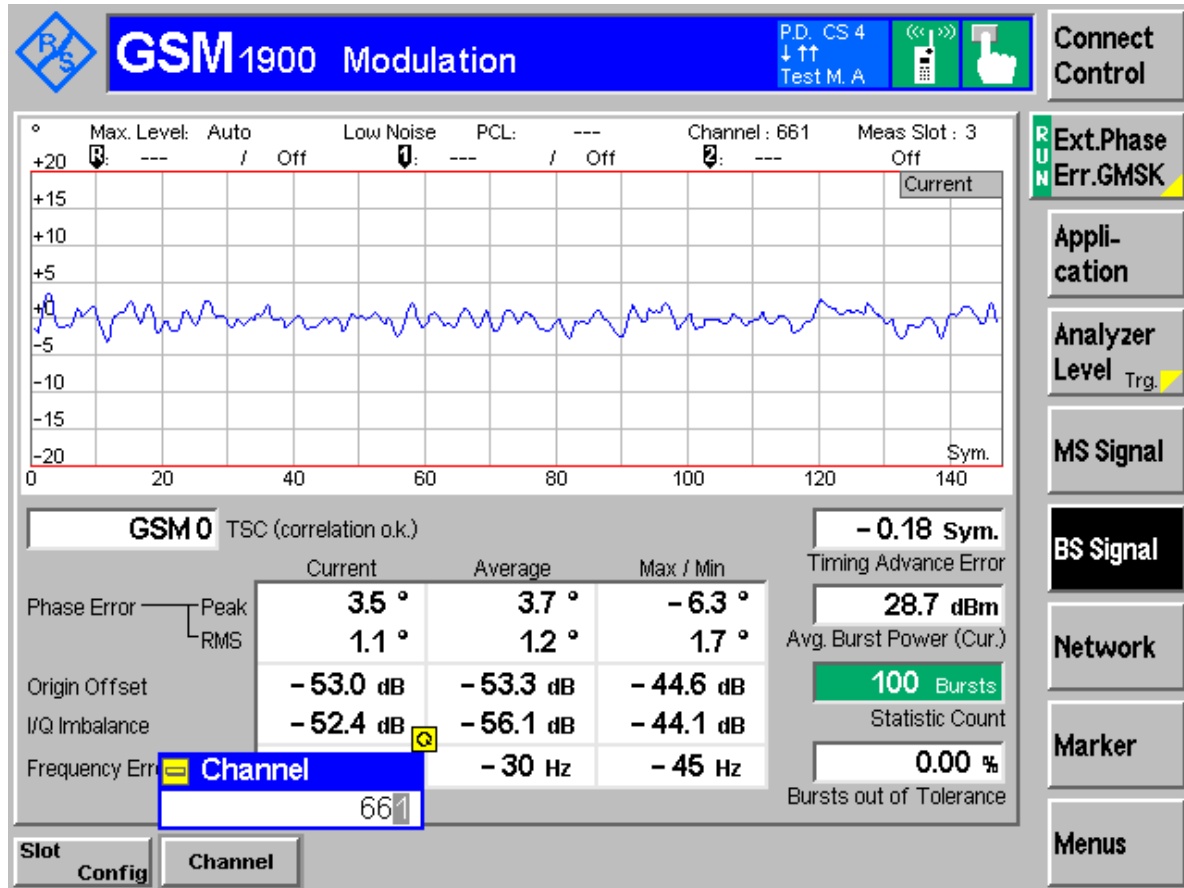
## **Appendix B**

### **Modulation Characteristics**

According to FCC Part 2.1047 & Part24 Subpart E

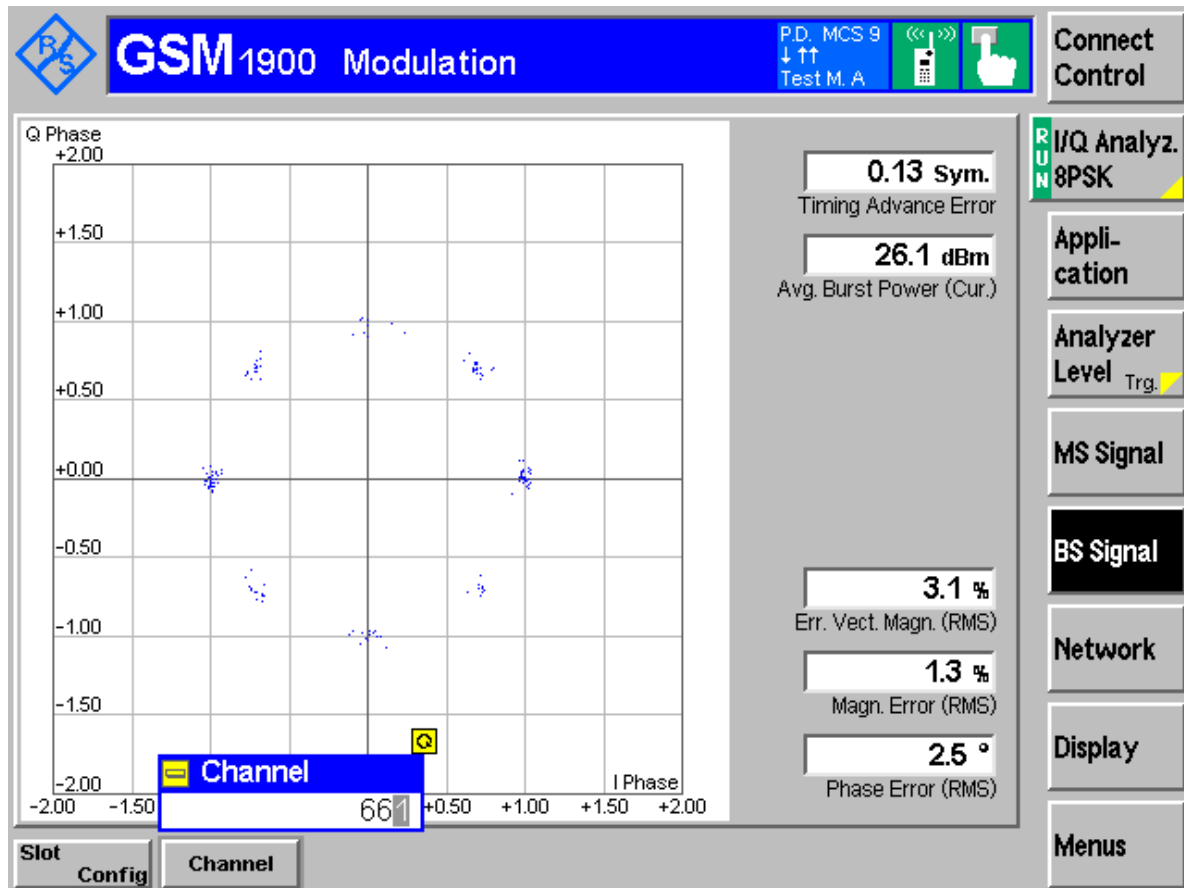


## TM1:GPRS/GSM Channel 661



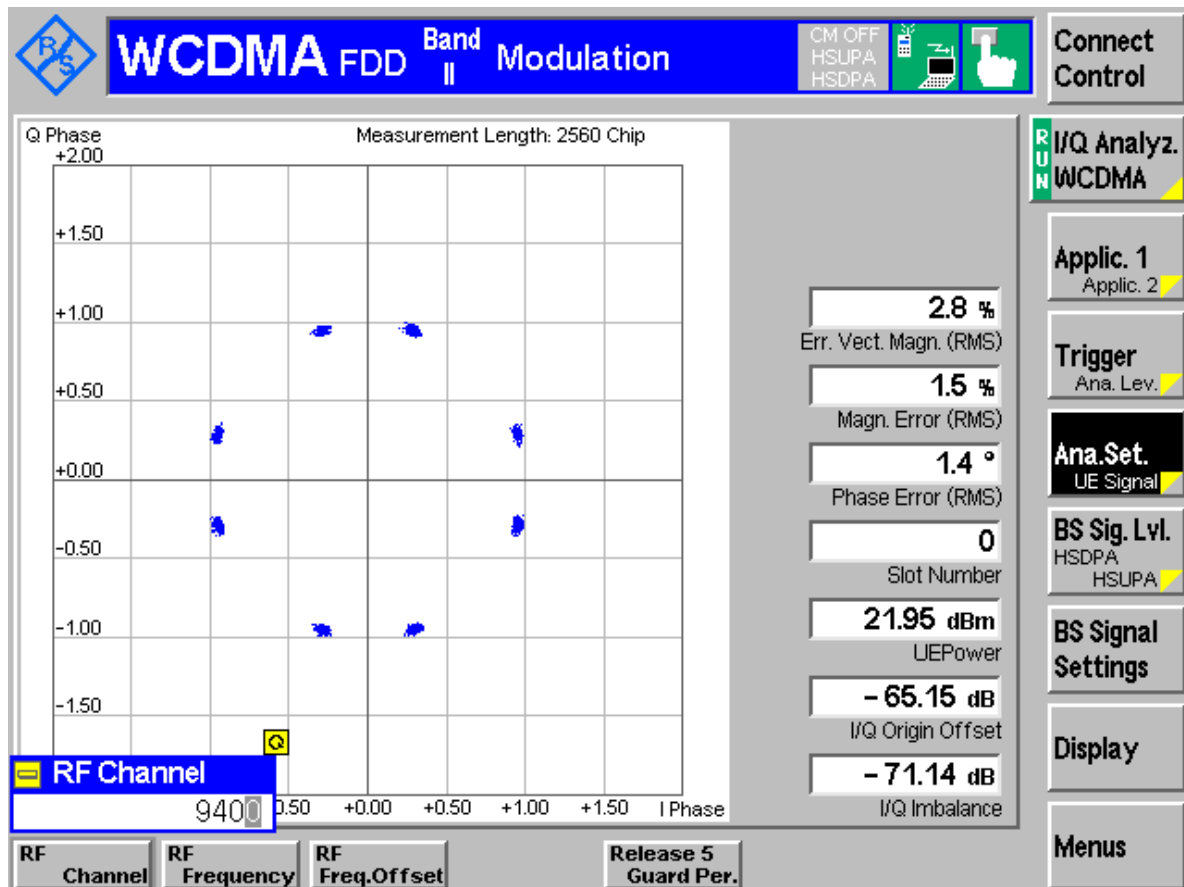


## TM2:EDGE Channel 661





## TM3: WCDMA Channel 9400



-----The END-----



## **Appendix C**

### **Occupied Bandwidth** According to FCC Part 2.1049 & Part 24 Subpart E

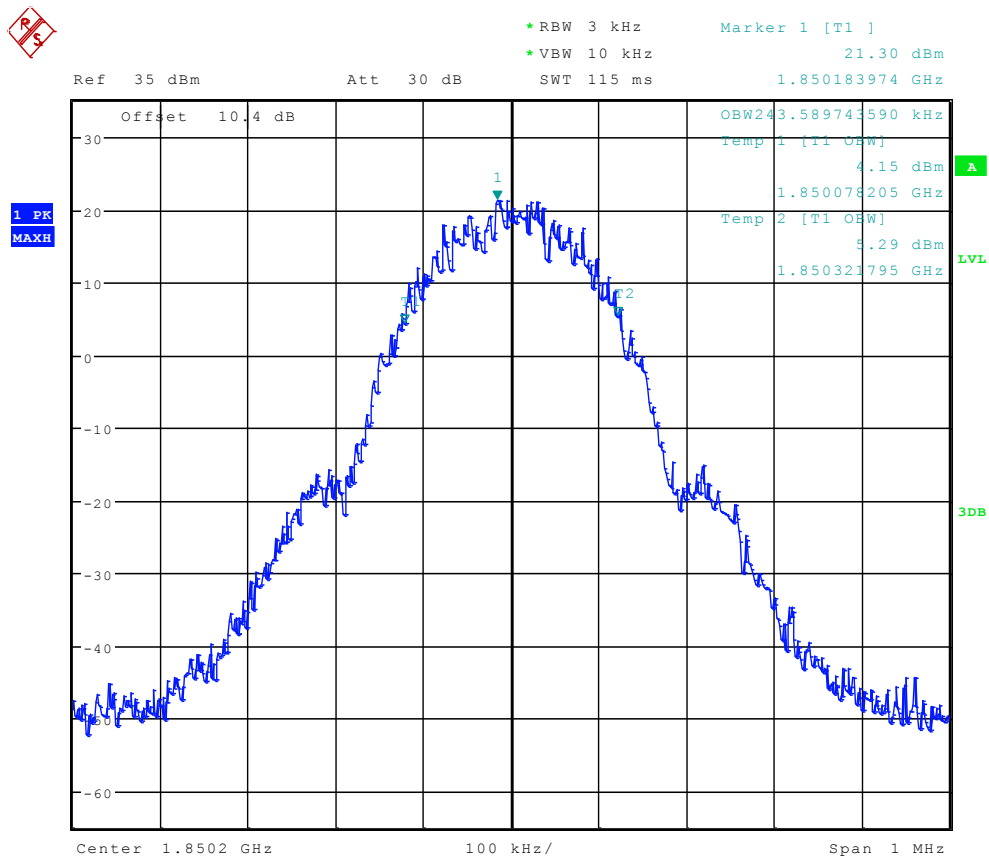


Table 1 Measurement Results

| Test Mode | RF Channel | Occupied Bandwidth [kHz] | Verdict |
|-----------|------------|--------------------------|---------|
| TM1       | 512        | 243.6                    | Pass    |
|           | 661        | 245.2                    | Pass    |
|           | 810        | 245.2                    | Pass    |
| TM2       | 512        | 245.2                    | Pass    |
|           | 661        | 243.6                    | Pass    |
|           | 810        | 240.4                    | Pass    |
| Test Mode | RF Channel | Occupied Bandwidth [MHz] | Verdict |
| TM3       | 9262       | 4.170                    | Pass    |
|           | 9400       | 4.170                    | Pass    |
|           | 9538       | 4.170                    | Pass    |



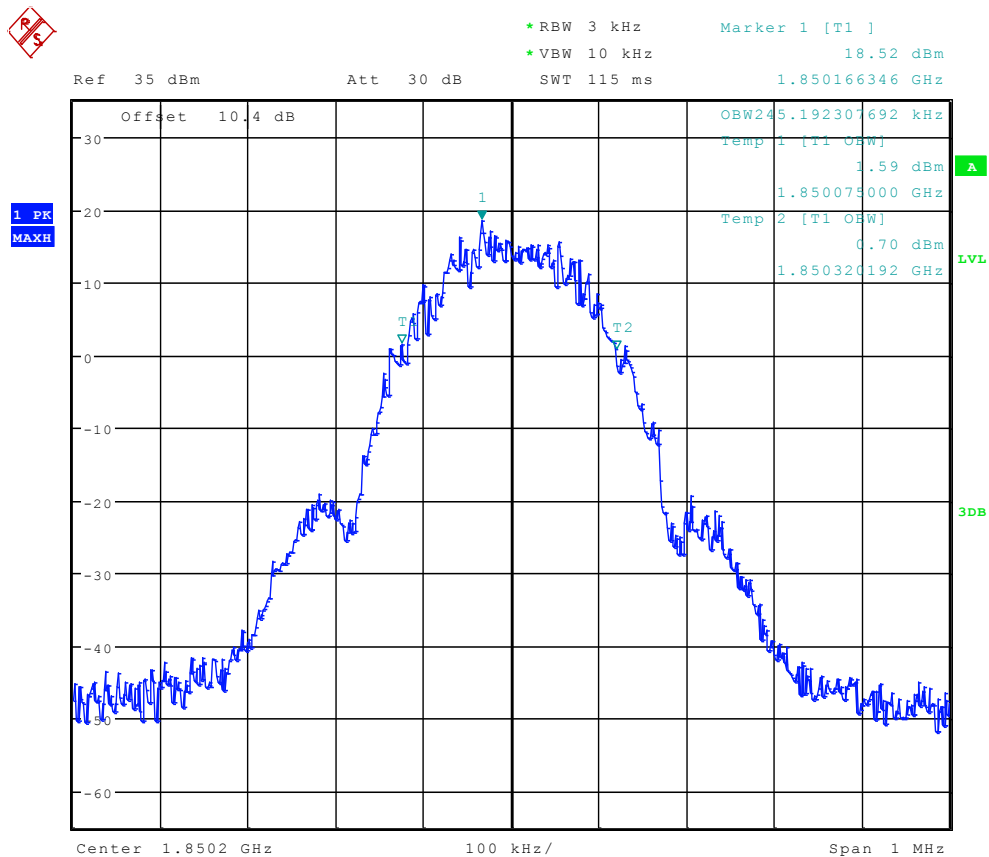
## TM1:GPRS/GSM Channel 512



Date: 5.MAR.2012 10:22:21



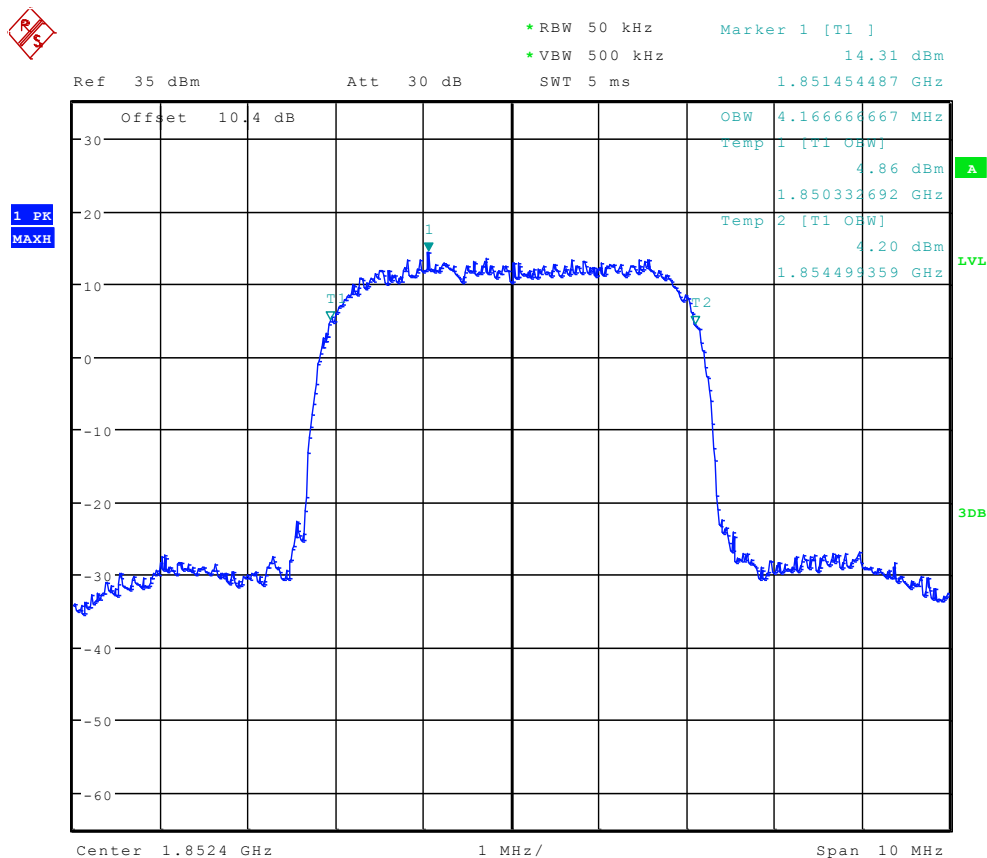
## TM2:EDGE Channel 512



Date: 5.MAR.2012 10:30:00



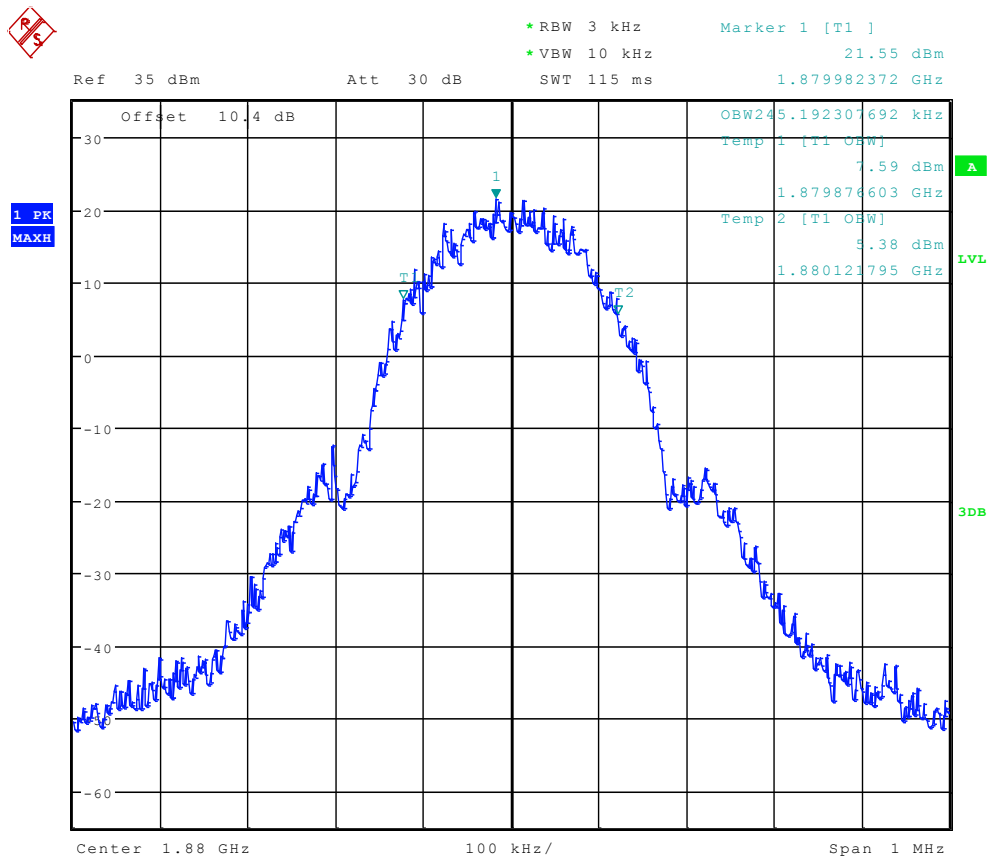
## TM3: WCDMA Channel 9262



Date: 5.MAR.2012 10:35:32



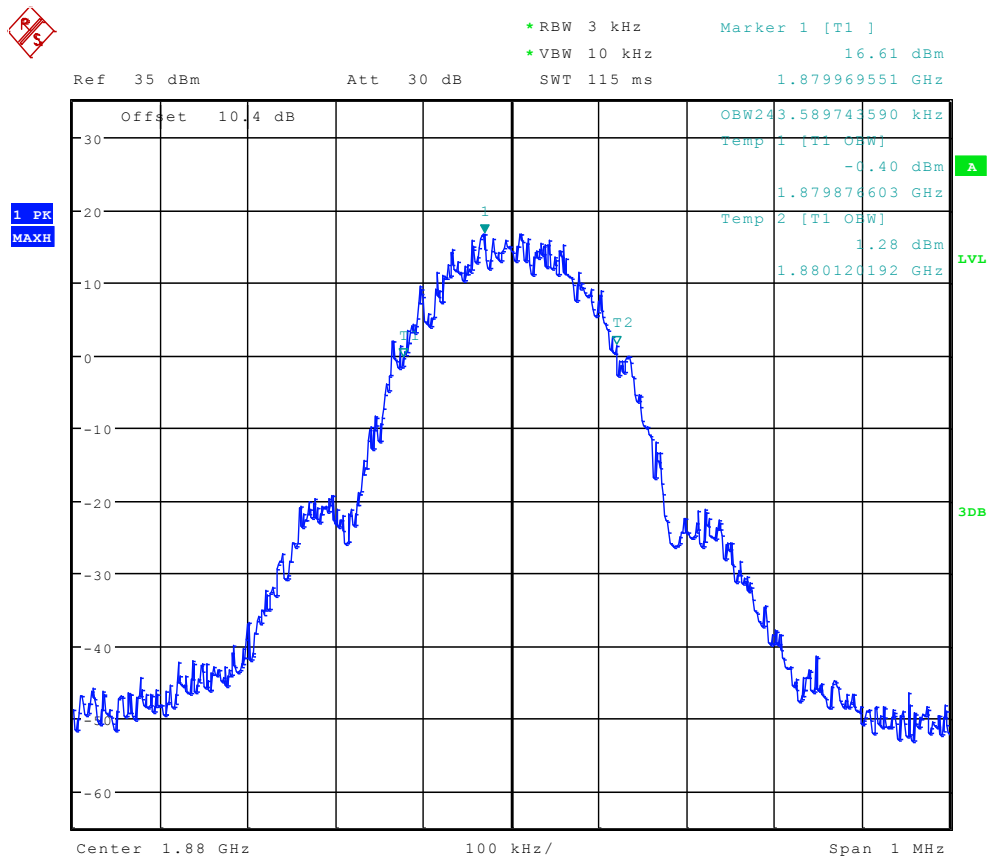
## TM1:GPRS/GSM Channel 661



Date: 5.MAR.2012 10:22:35



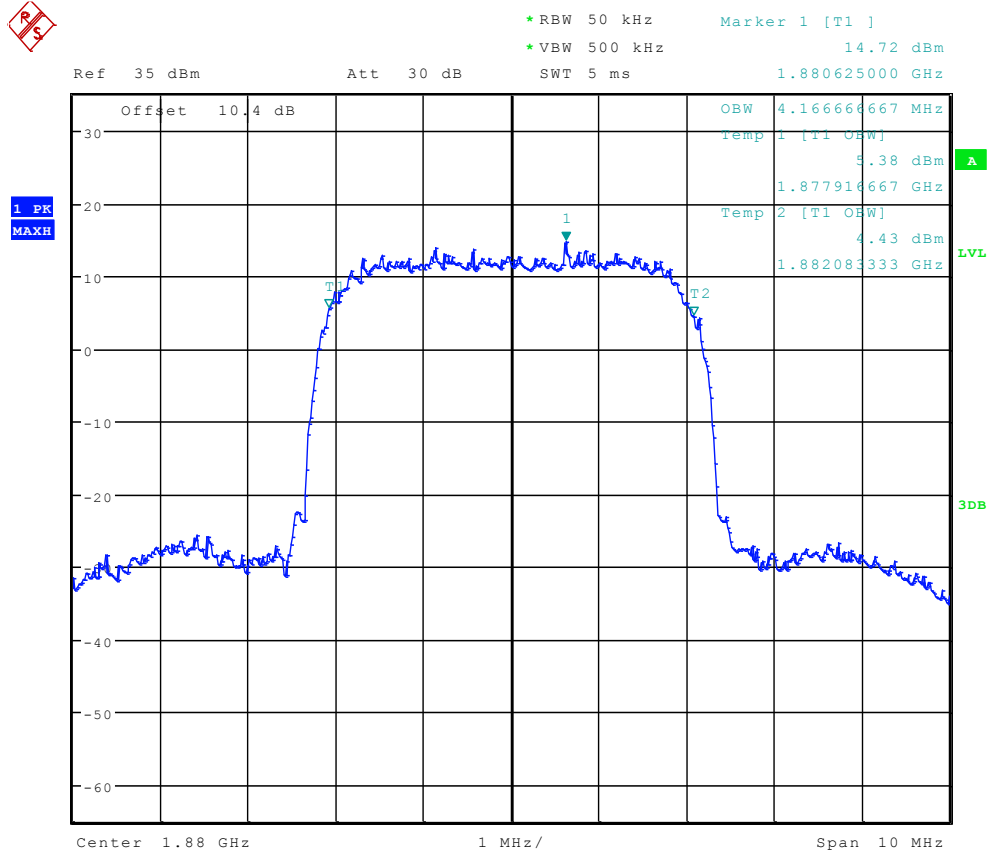
## TM2:EDGE Channel 661



Date: 5.MAR.2012 10:30:14



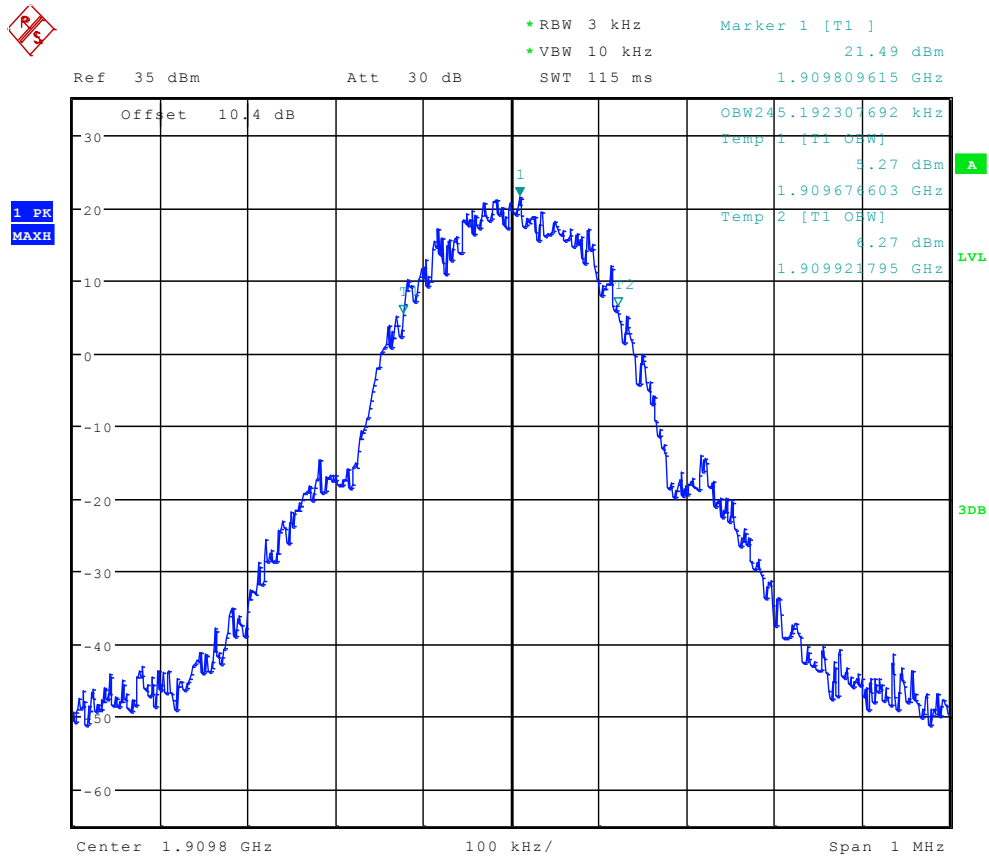
## TM3: WCDMA Channel 9400



Date: 5.MAR.2012 10:35:46



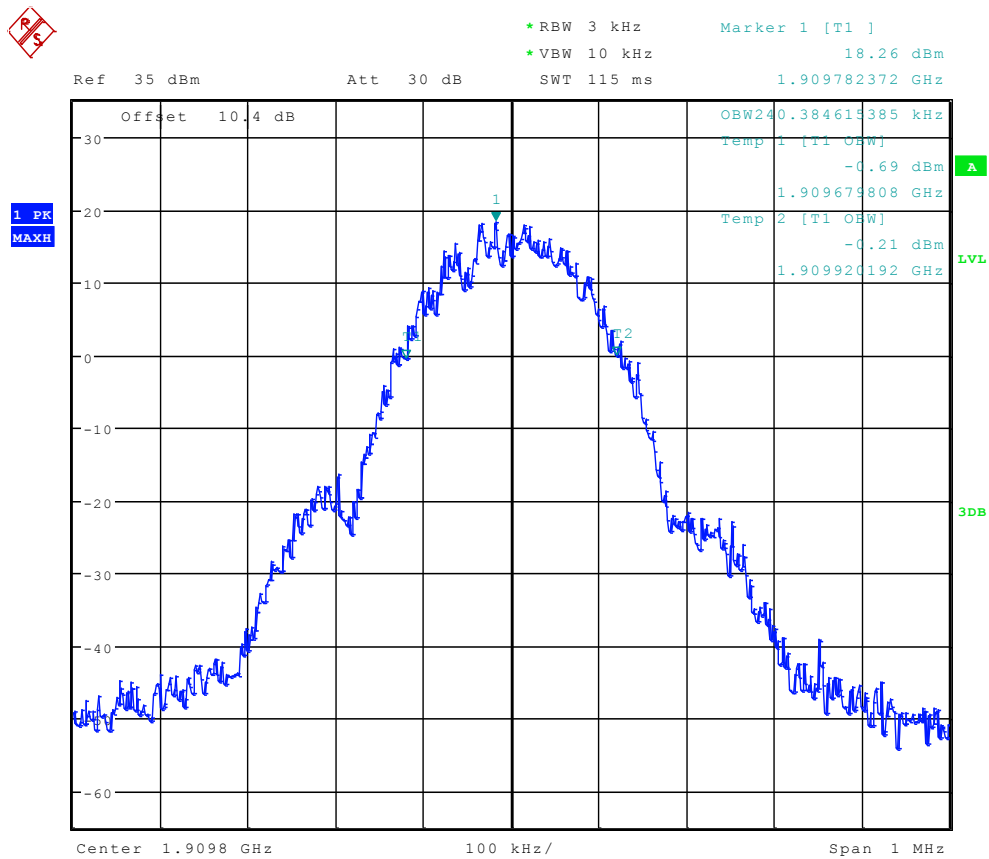
## TM1:GPRS/GSM Channel 810



Date: 5.MAR.2012 10:22:48



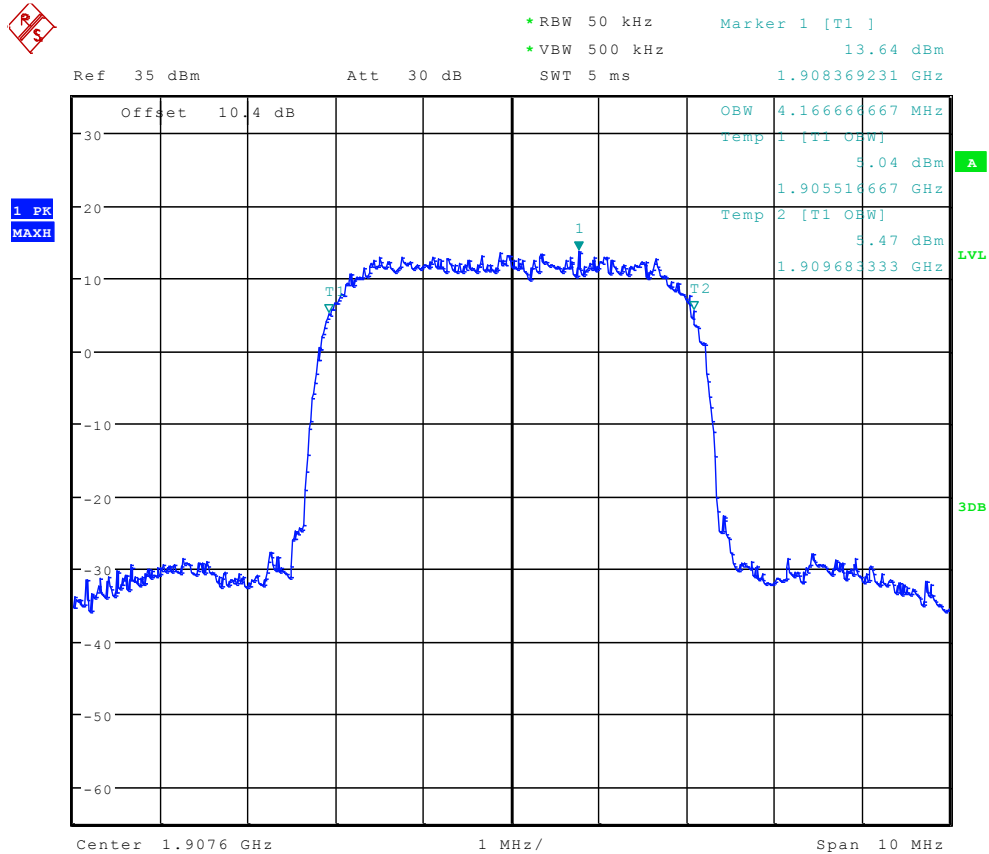
## TM2:EDGE Channel 810



Date: 5.MAR.2012 10:30:28



## TM3: WCDMA Channel 9538



Date: 5.MAR.2012 10:35:59

The END



## **Appendix D**

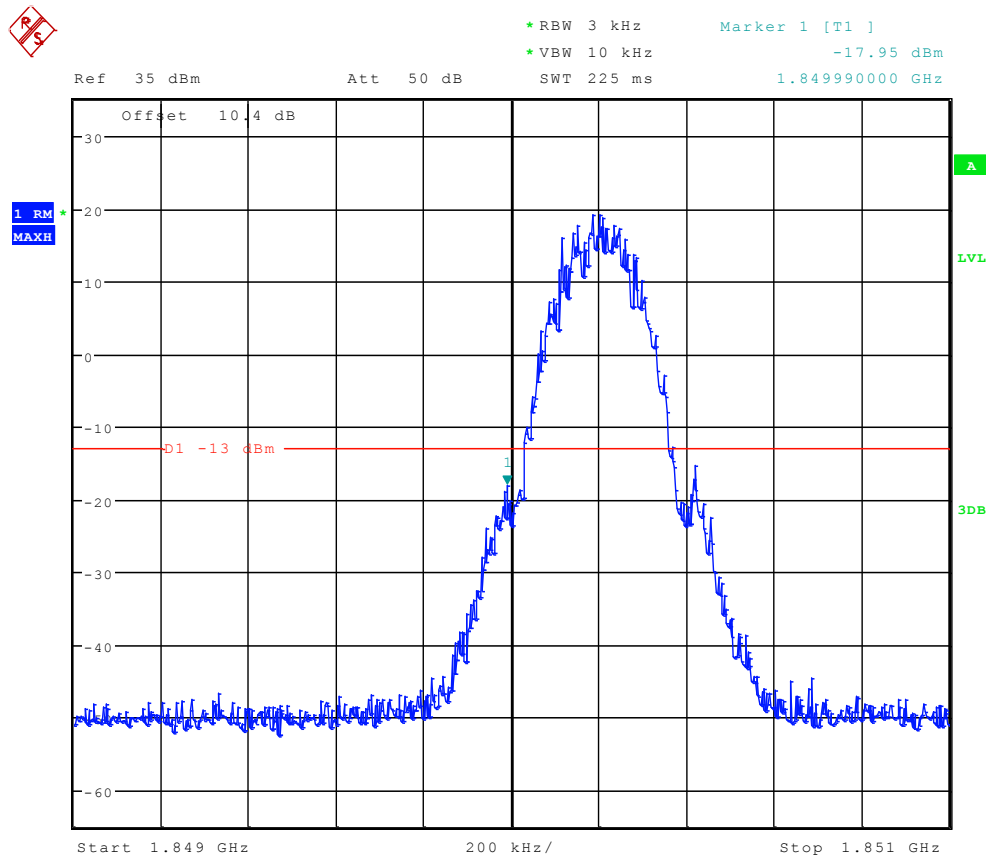
### **Band Edges Compliance** According to FCC Part 2.1051 & 24.238



# TM1:GPRS/GSM

## Left Edge

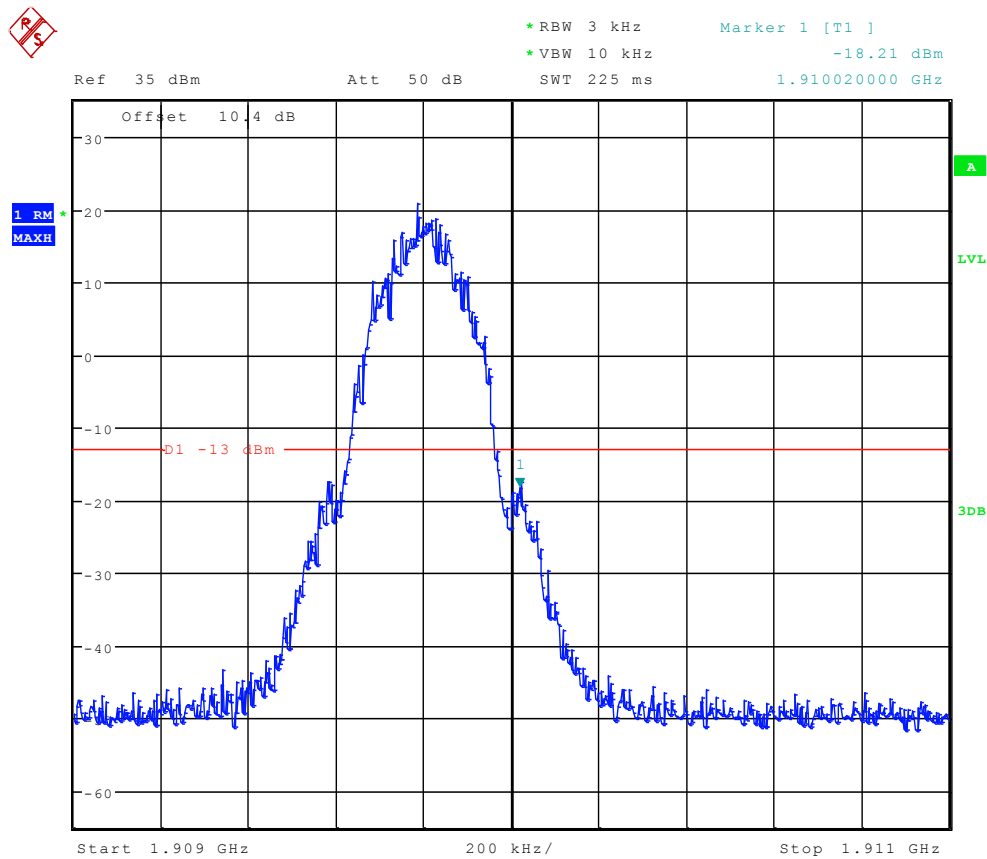
### Channel 512



Date: 5.MAR.2012 10:25:20



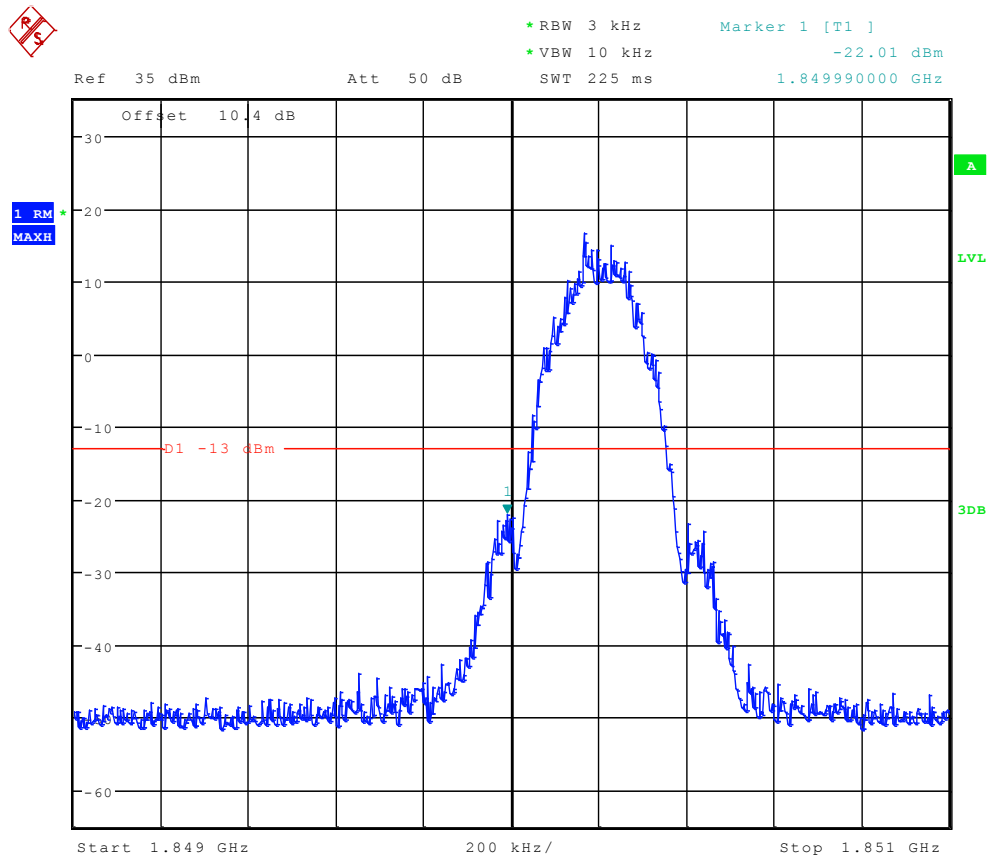
## Right Edge Channel 810



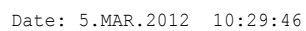
Date: 5.MAR.2012 10:25:41



## TM2:EDGE Left Edge Channel 512



Date: 5.MAR.2012 10:29:31

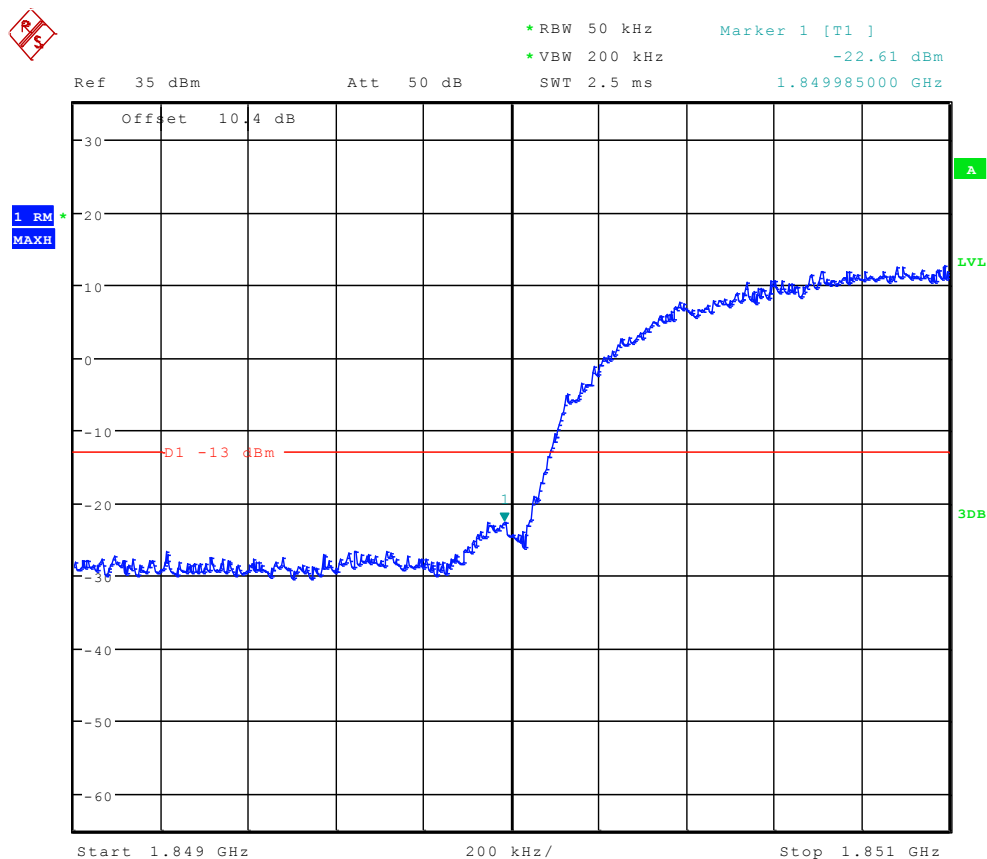




## TM3: WCDMA

### Left Edge

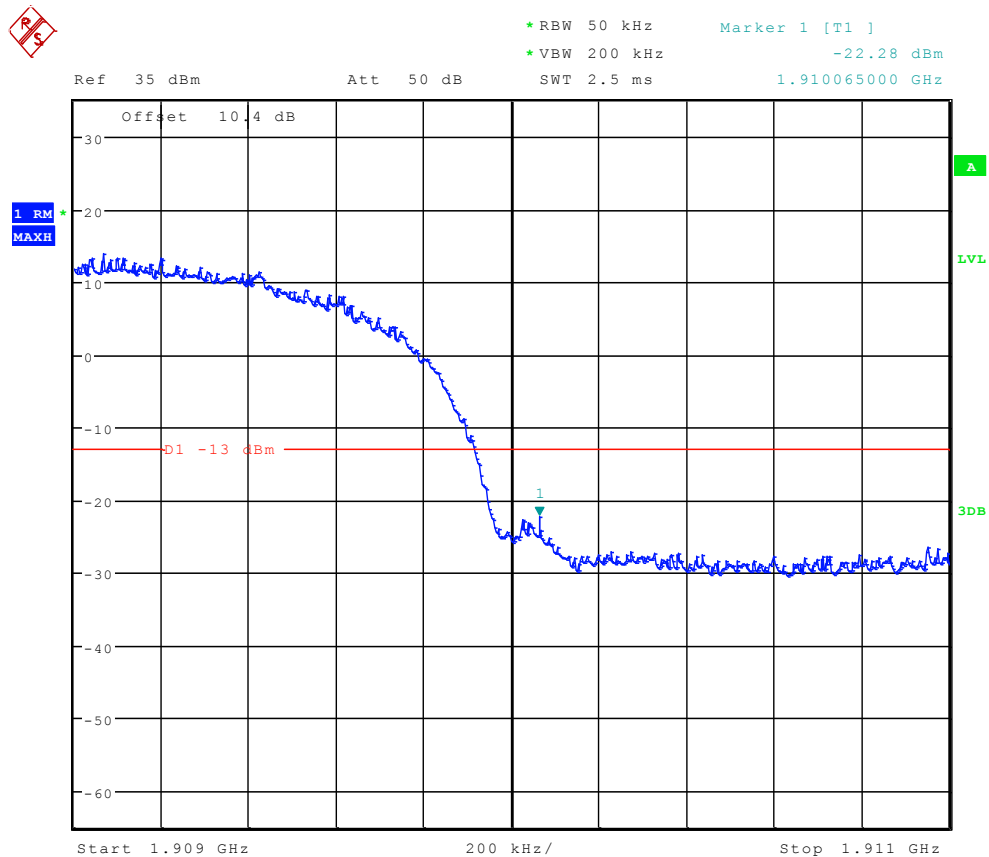
### Channel 9262



Date: 5.MAR.2012 10:36:14



## Right Edge Channel 9538



Date: 5.MAR.2012 10:36:28

The END



## **Appendix E**

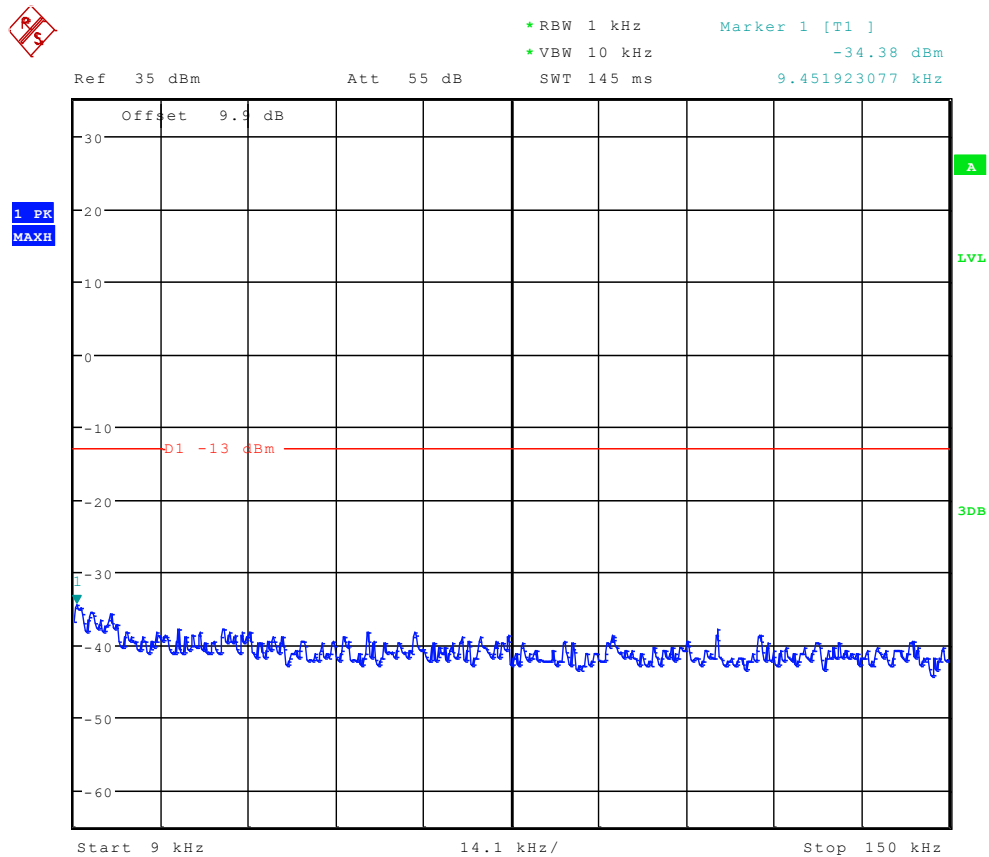
# Spurious Emission at Antenna Terminal

According to FCC Part 2.1051 & 24.238

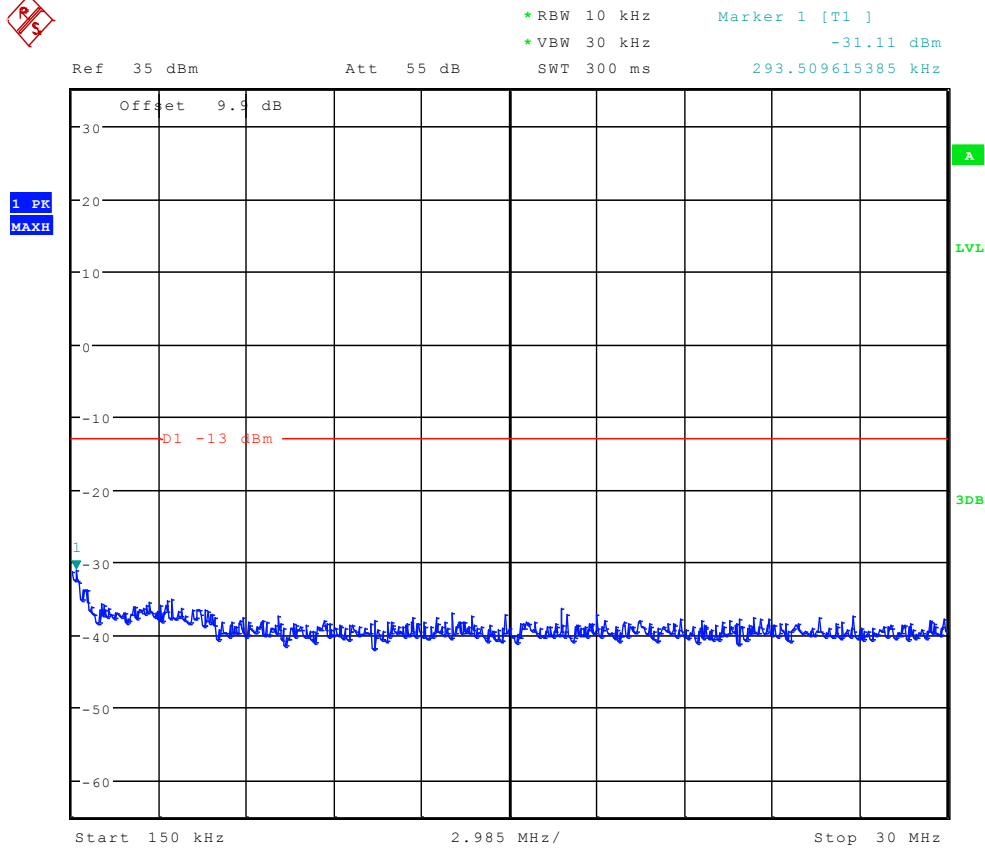


## TM1:GPRS/GSM

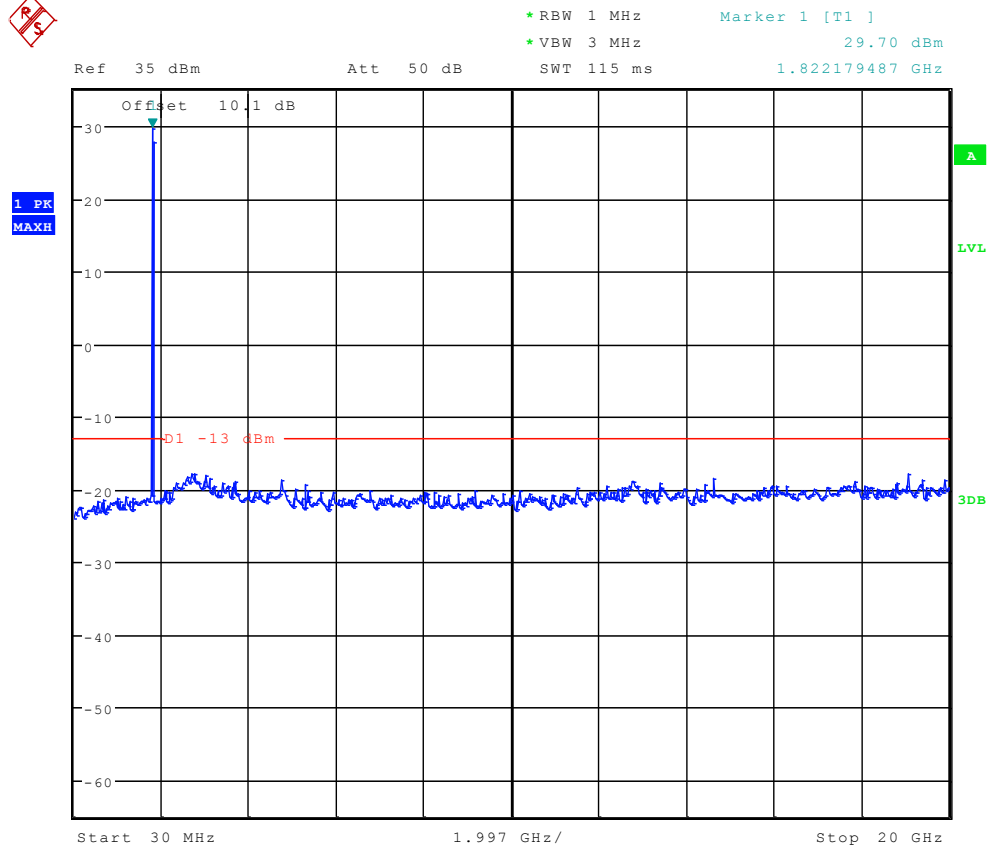
### Channel 512



Date: 5.MAR.2012 10:23:03



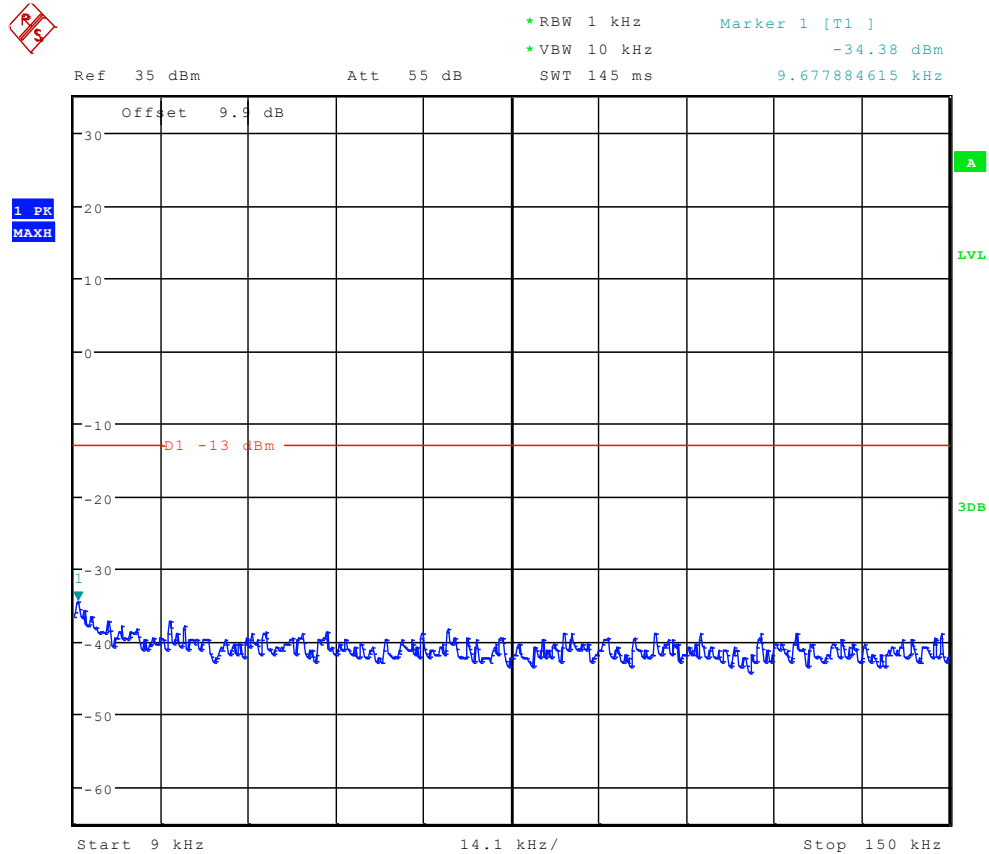
Date: 5.MAR.2012 10:23:53



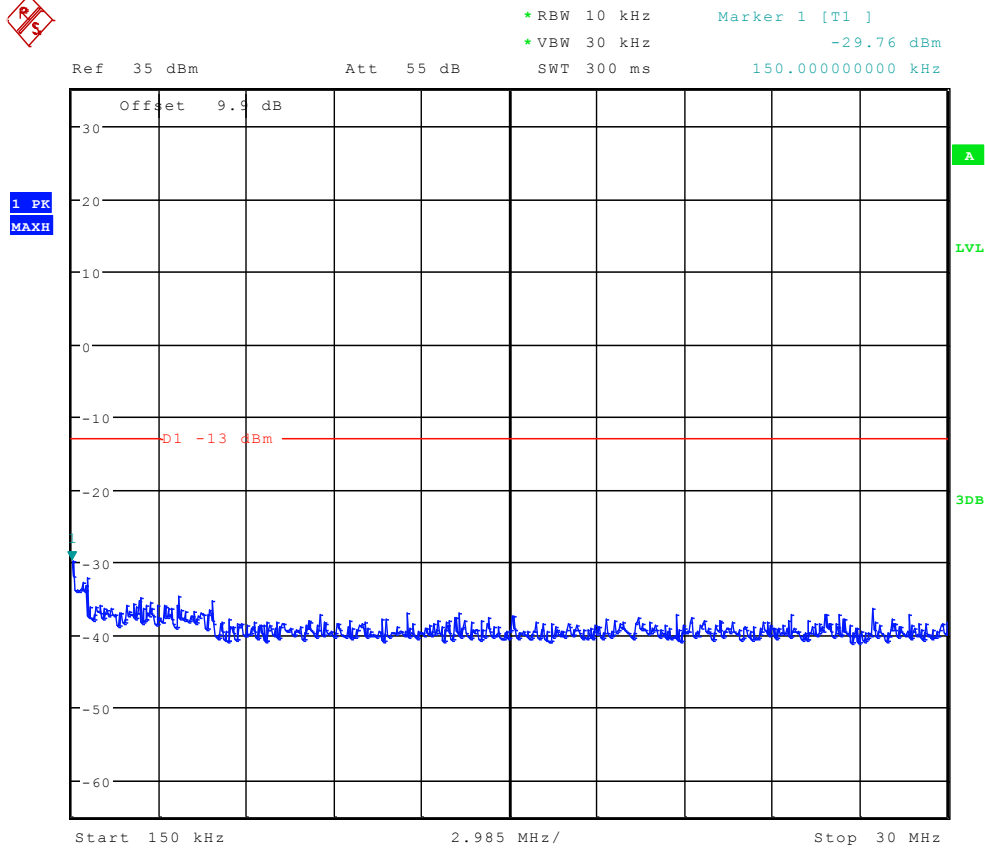
Date: 5.MAR.2012 10:24:37



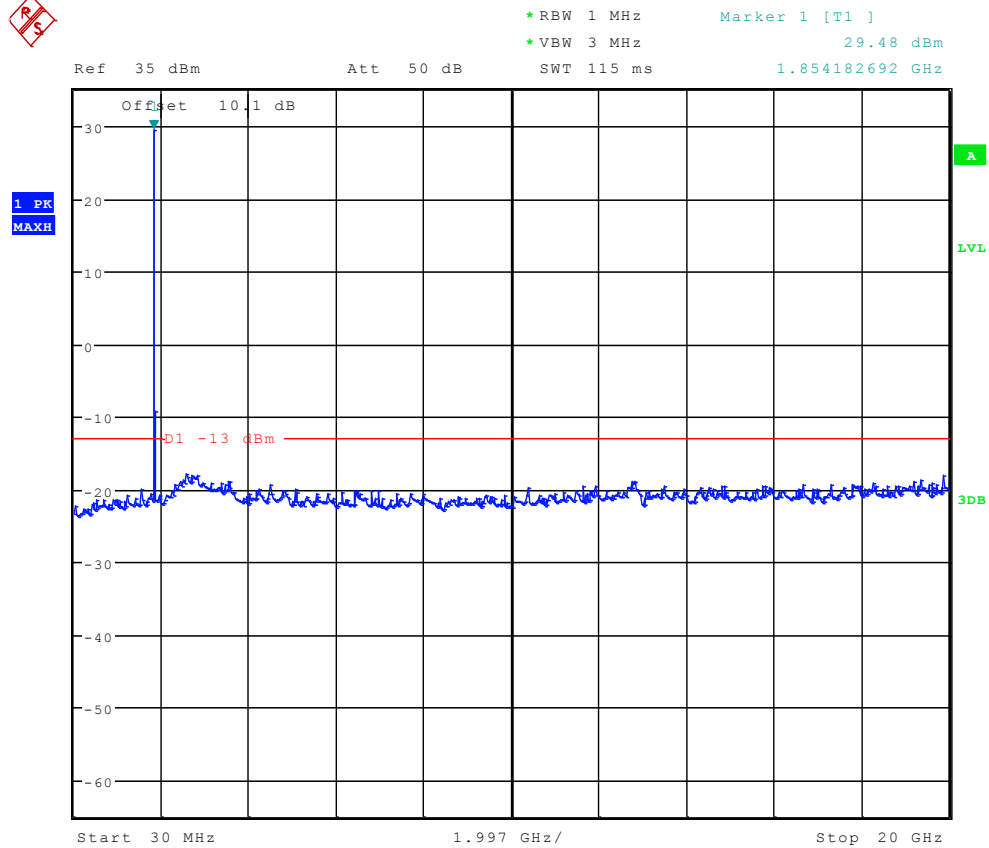
## Channel 661



Date: 5.MAR.2012 10:23:18



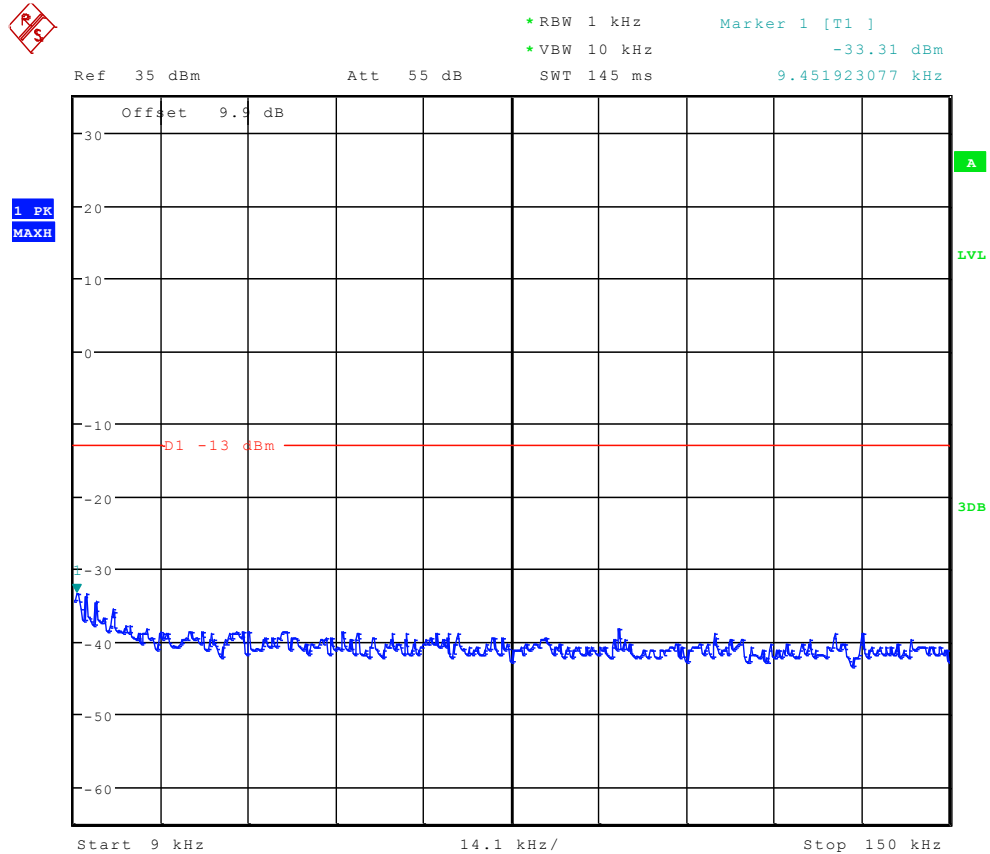
Date: 5.MAR.2012 10:24:07



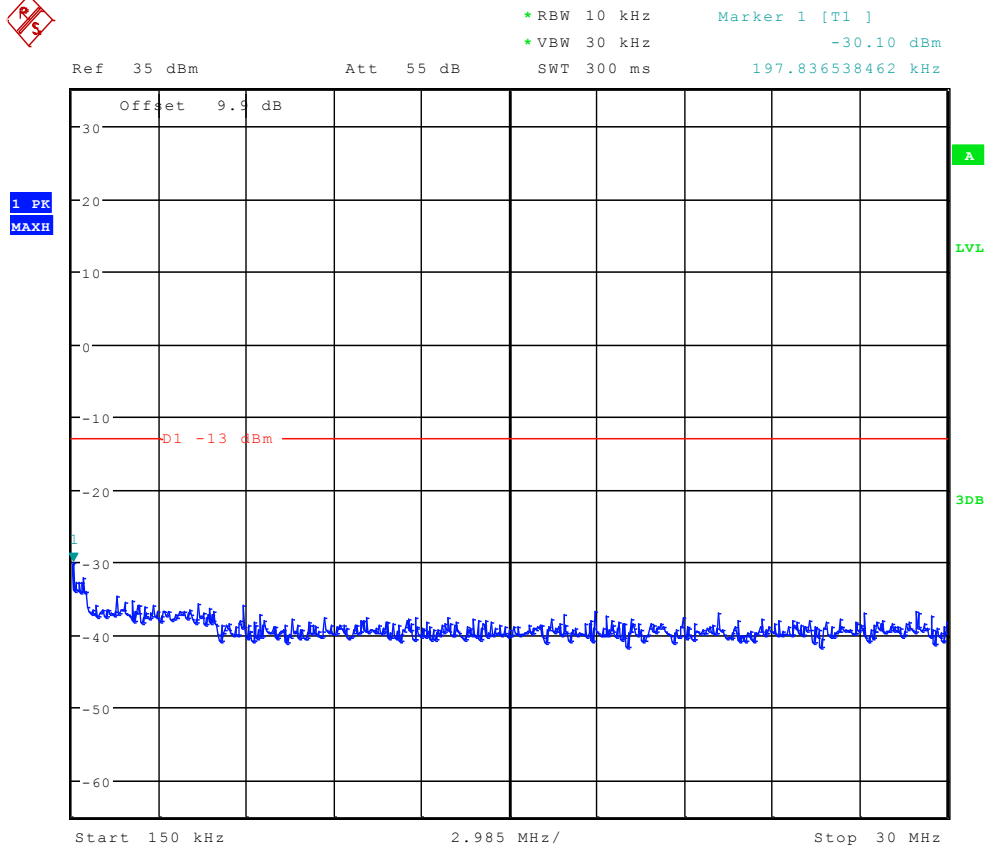
Date: 5.MAR.2012 10:24:51



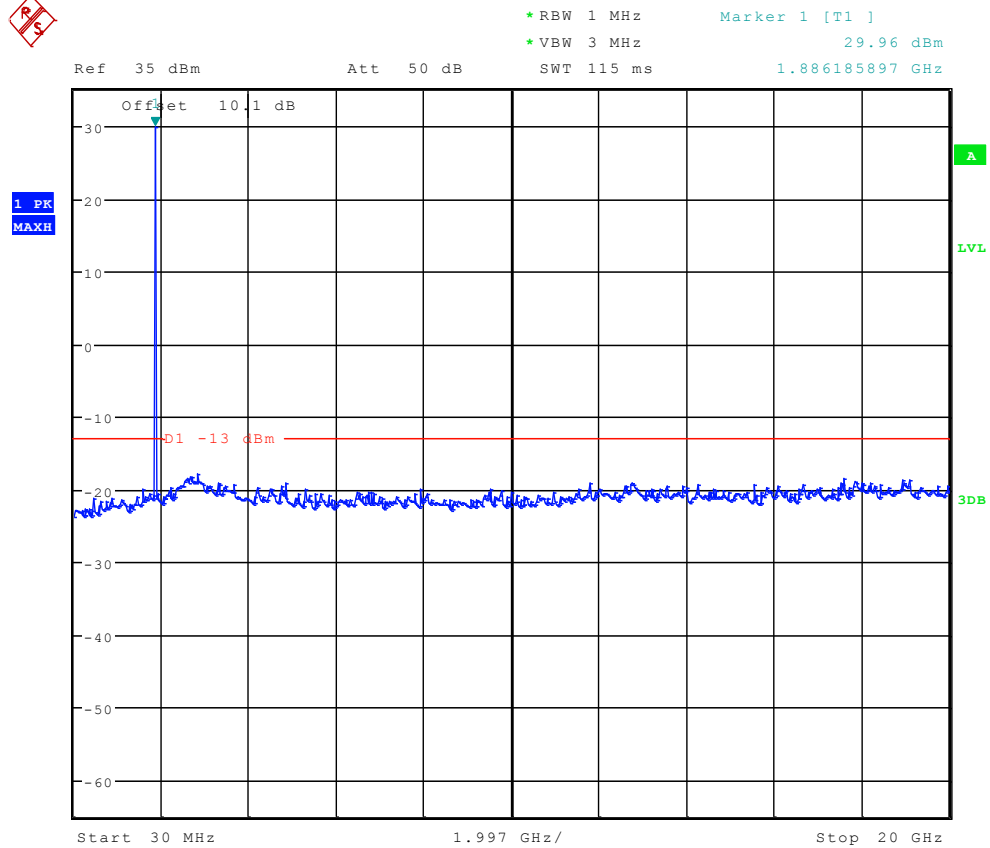
## Channel 810



Date: 5.MAR.2012 10:23:38



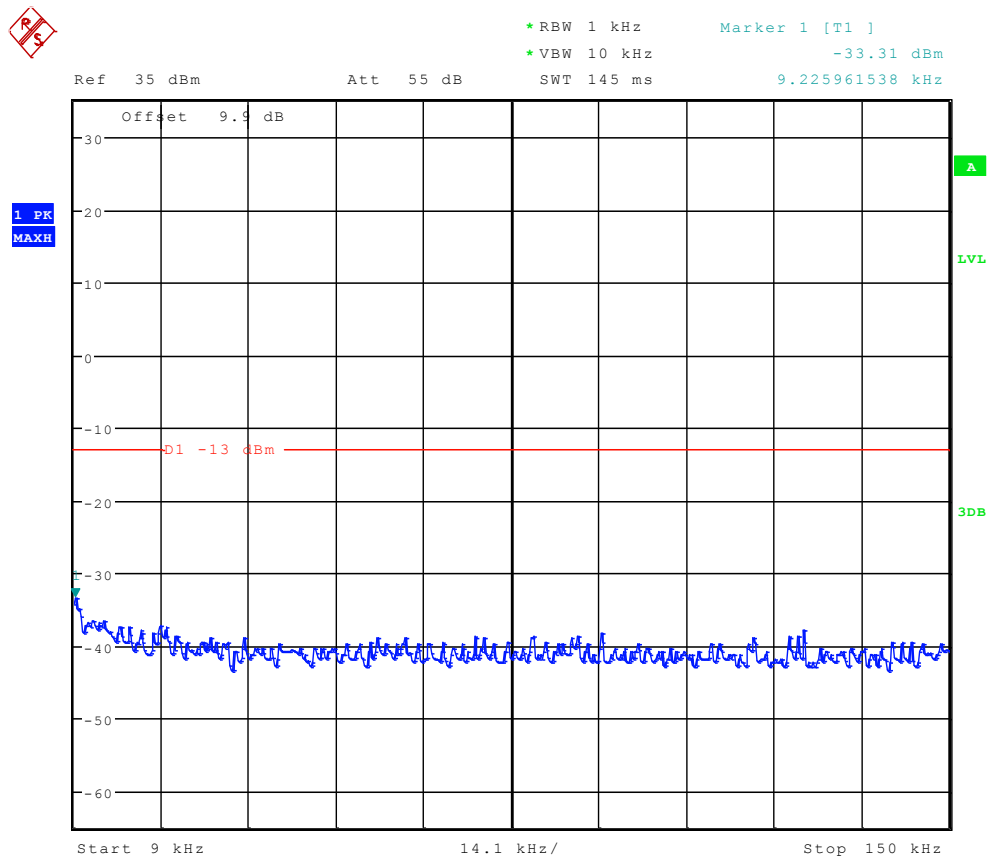
Date: 5.MAR.2012 10:24:22



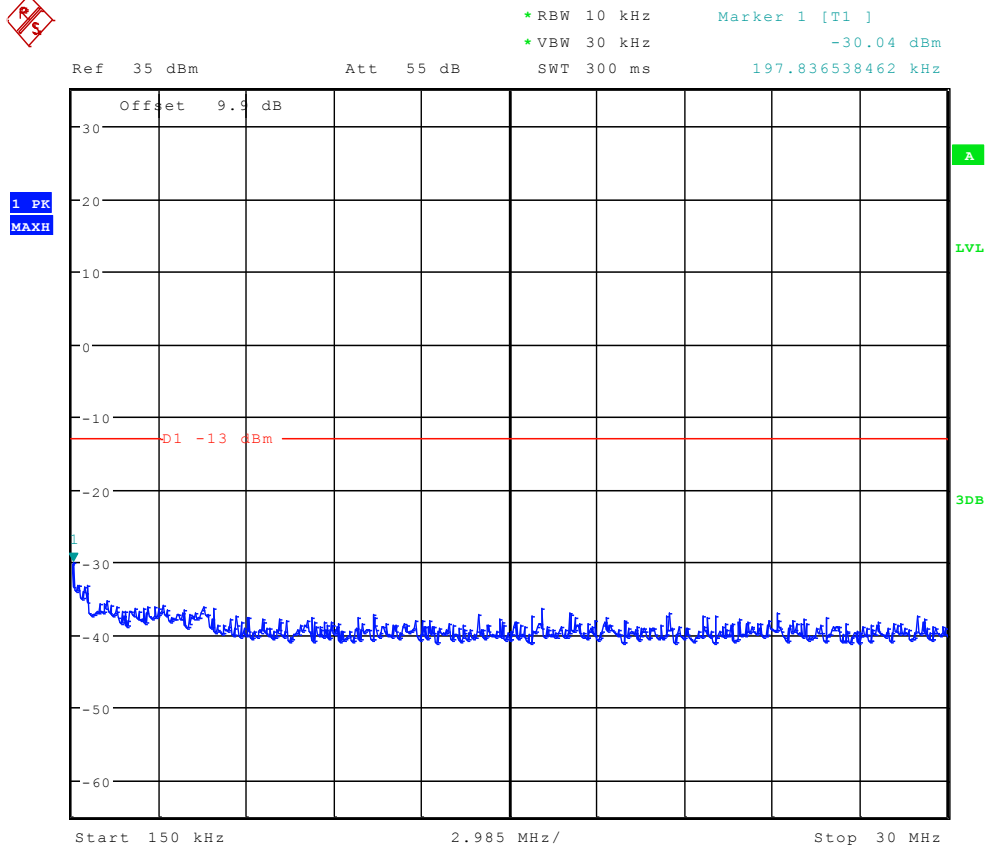
Date: 5.MAR.2012 10:25:06



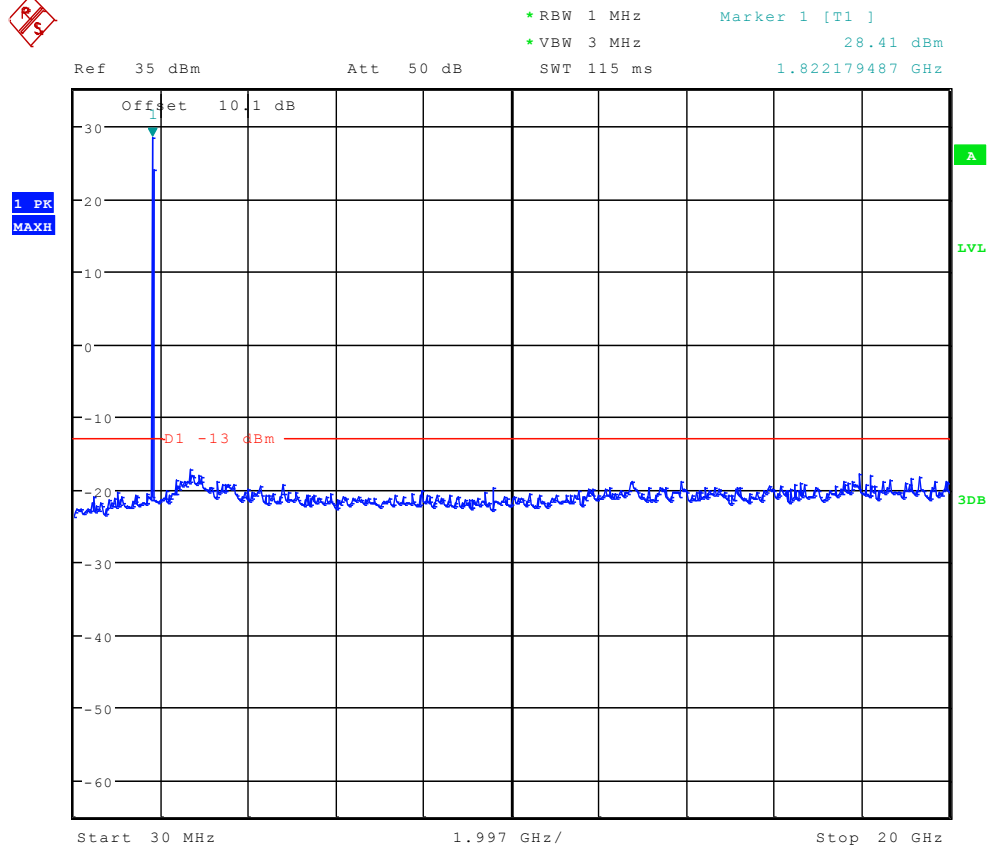
## TM2:EDGE Channel 512



Date: 5.MAR.2012 10:30:43



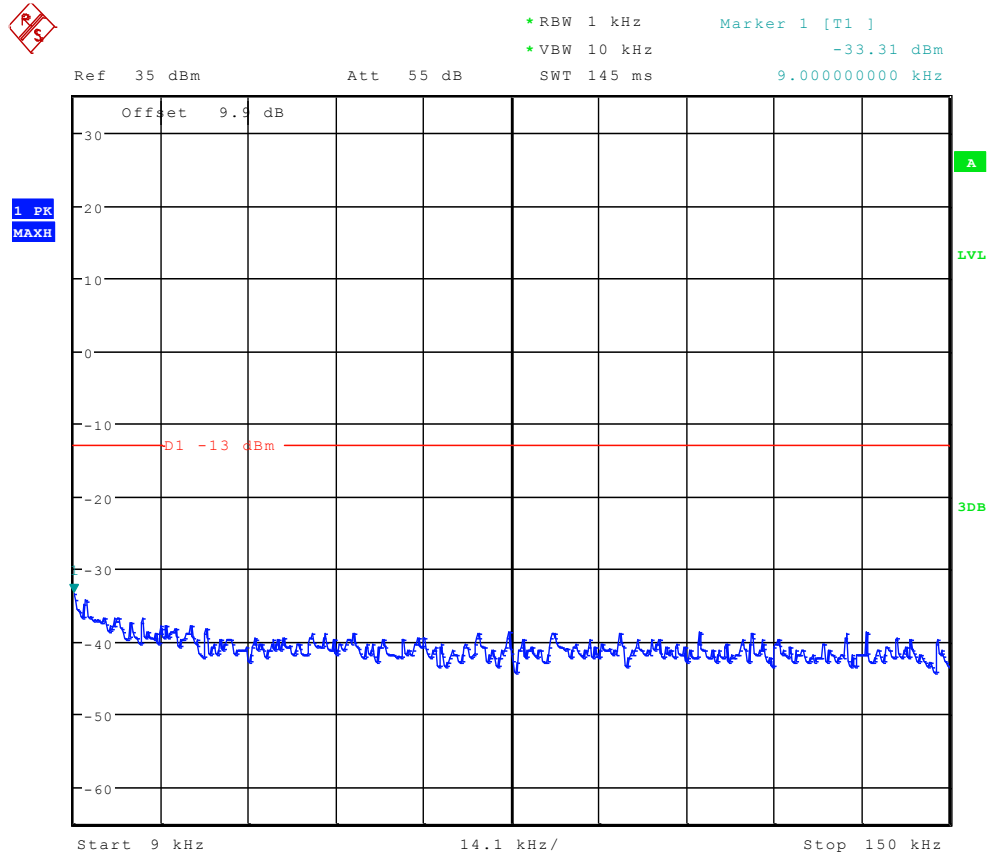
Date: 5.MAR.2012 10:31:26



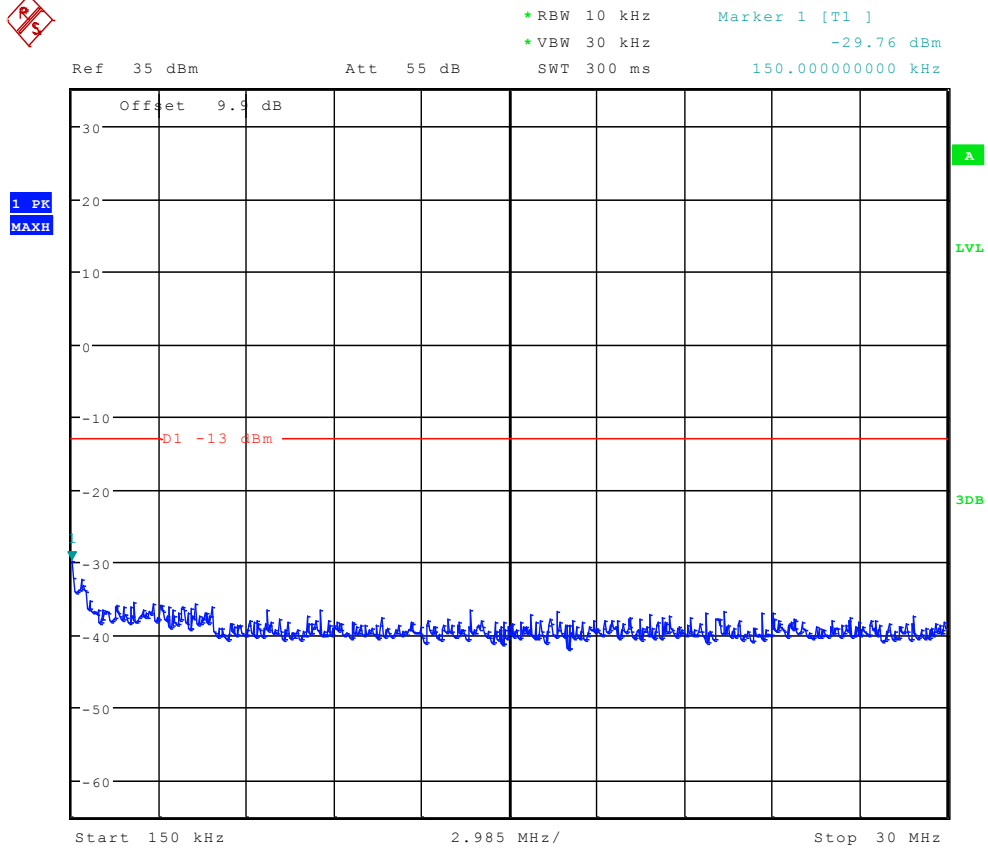
Date: 5.MAR.2012 10:32:10



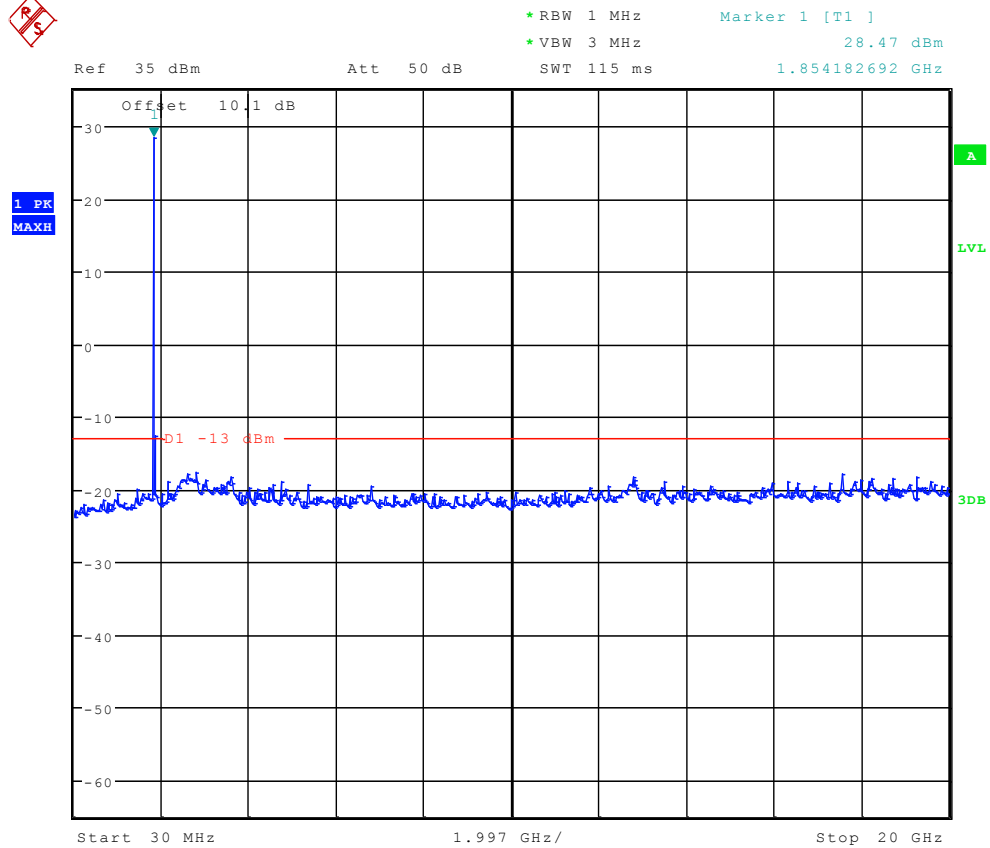
## Channel 661



Date: 5.MAR.2012 10:30:57



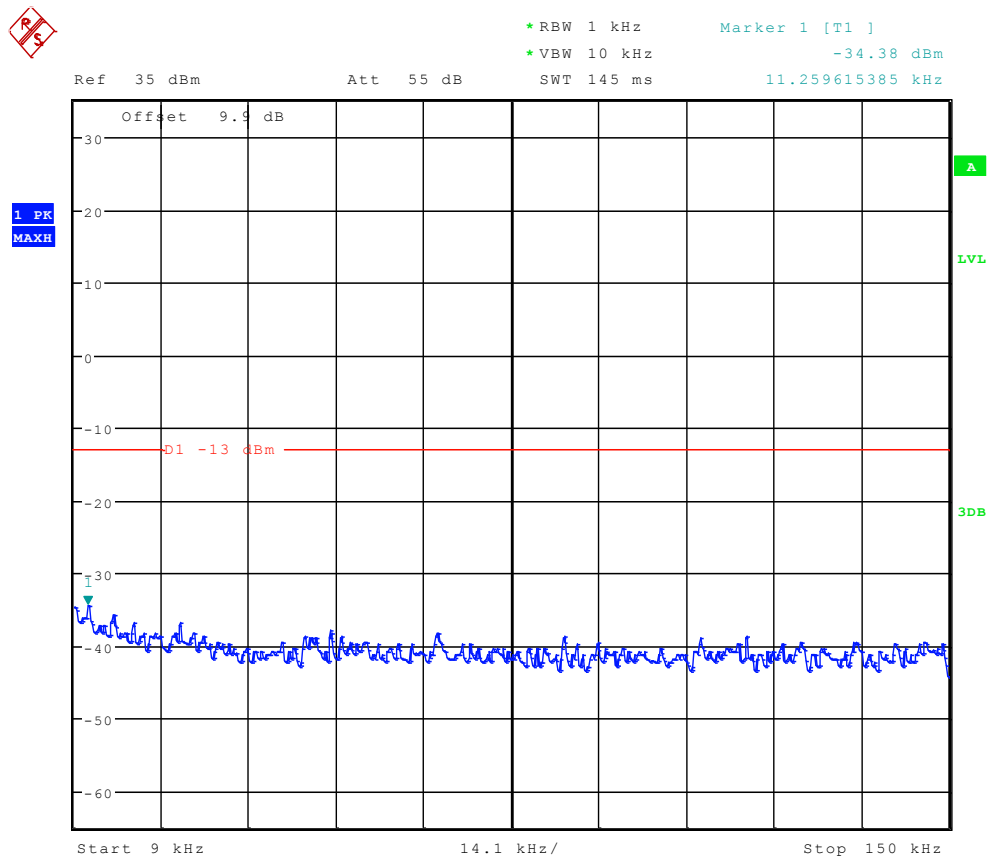
Date: 5.MAR.2012 10:31:41



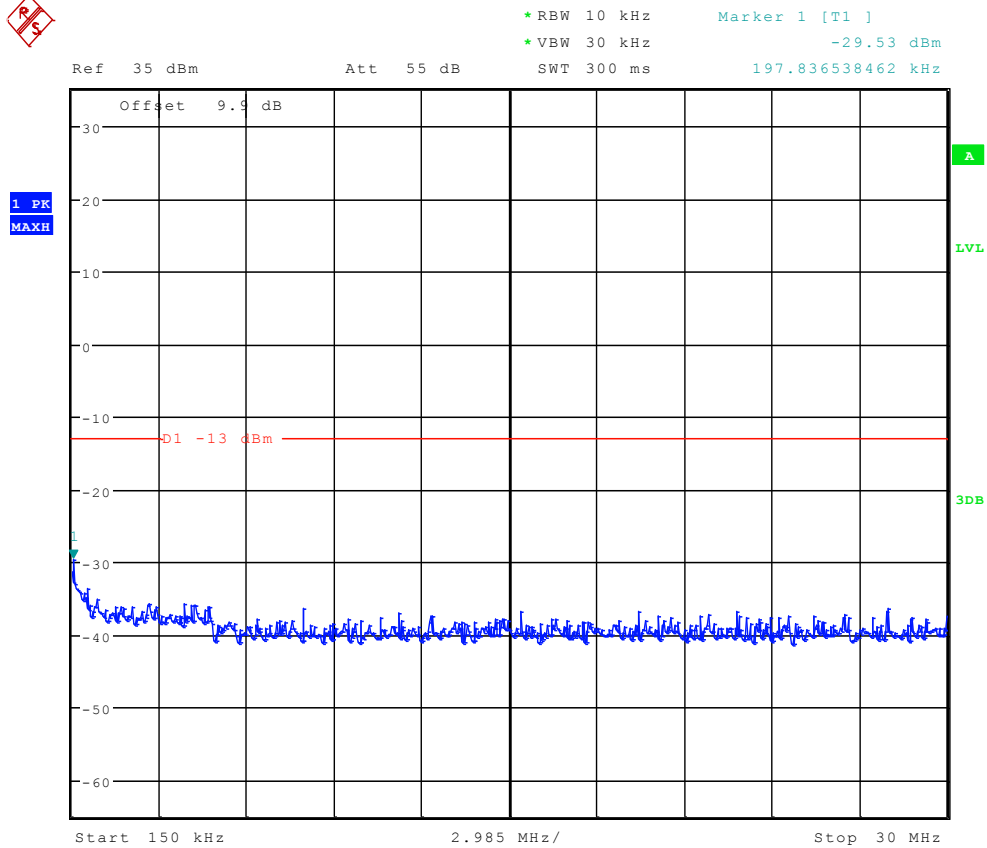
Date: 5.MAR.2012 10:32:25



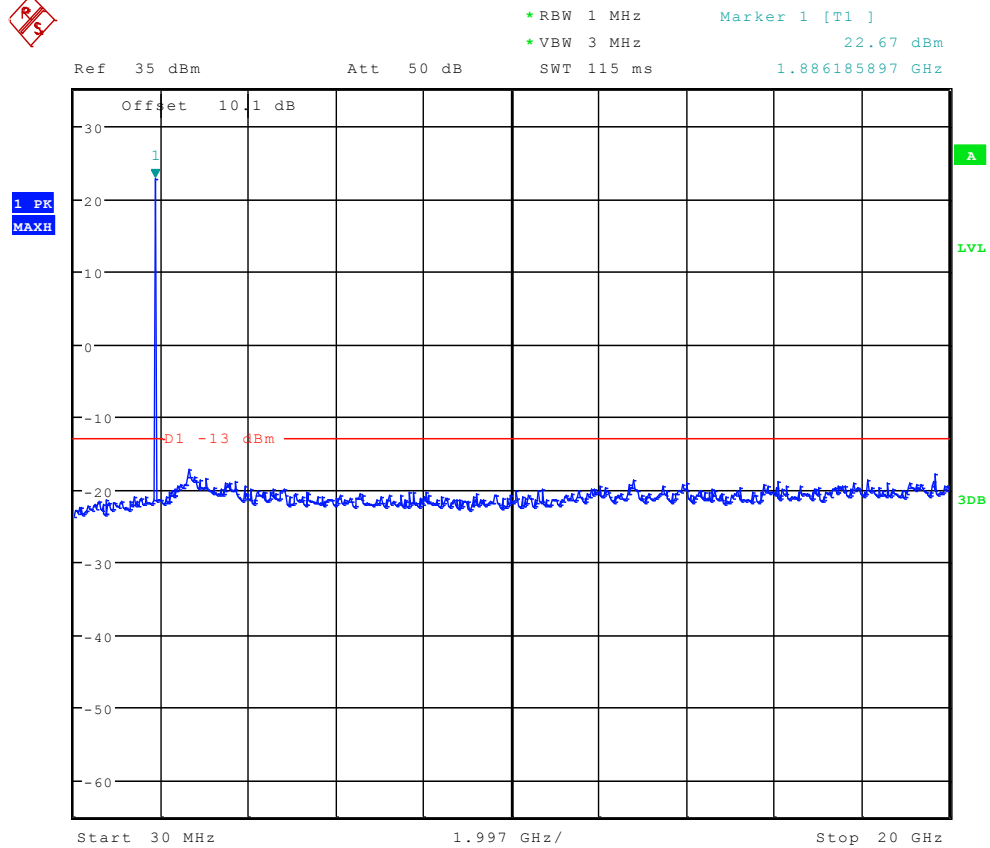
## Channel 810



Date: 5.MAR.2012 10:31:11



Date: 5.MAR.2012 10:31:55

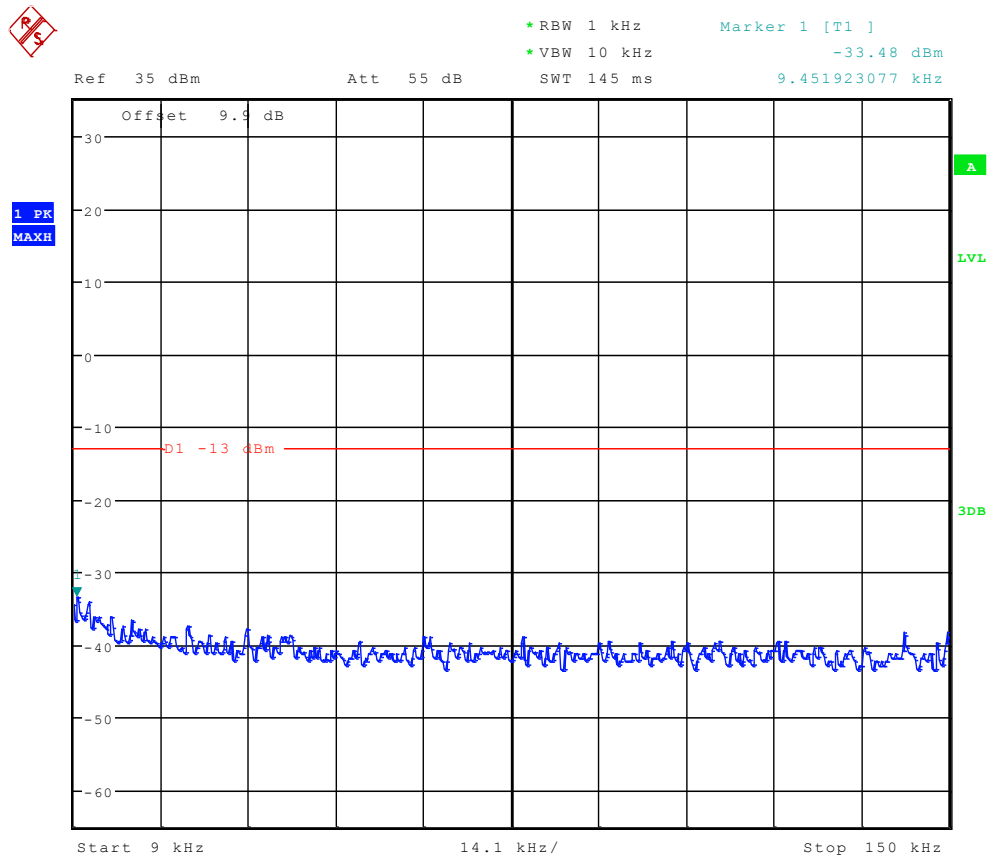


Date: 5.MAR.2012 10:32:39

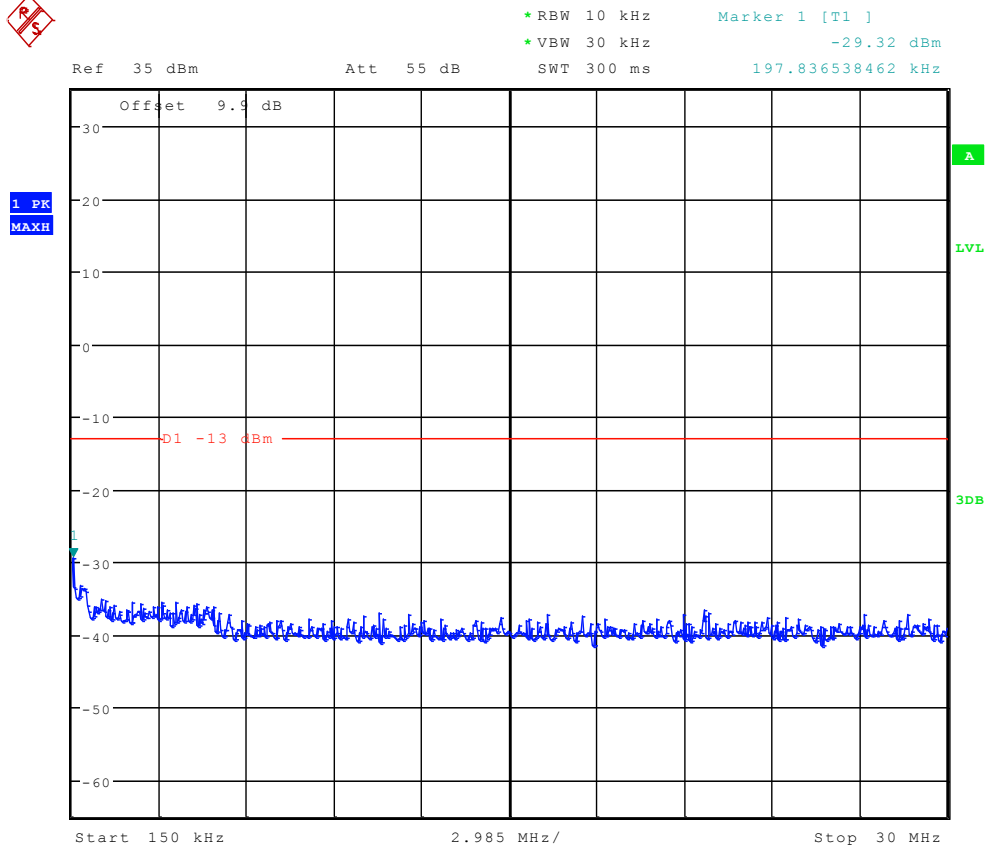


## TM3: WCDMA

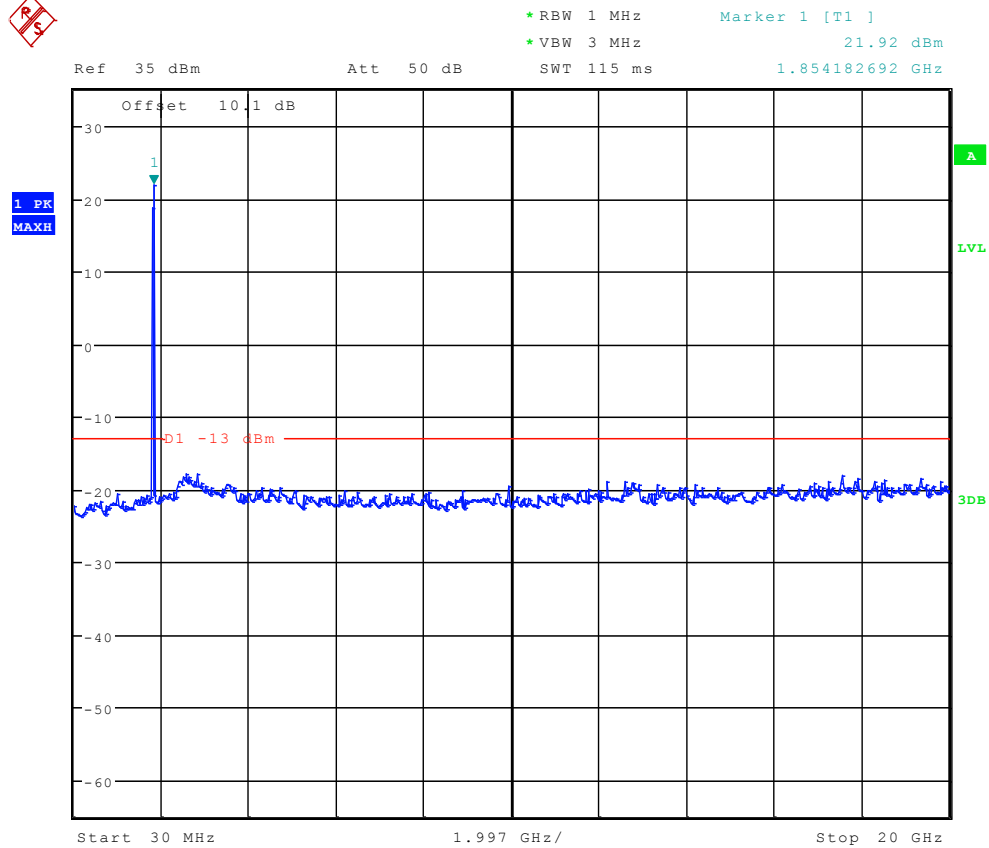
### Channel 9262



Date: 5.MAR.2012 10:36:42



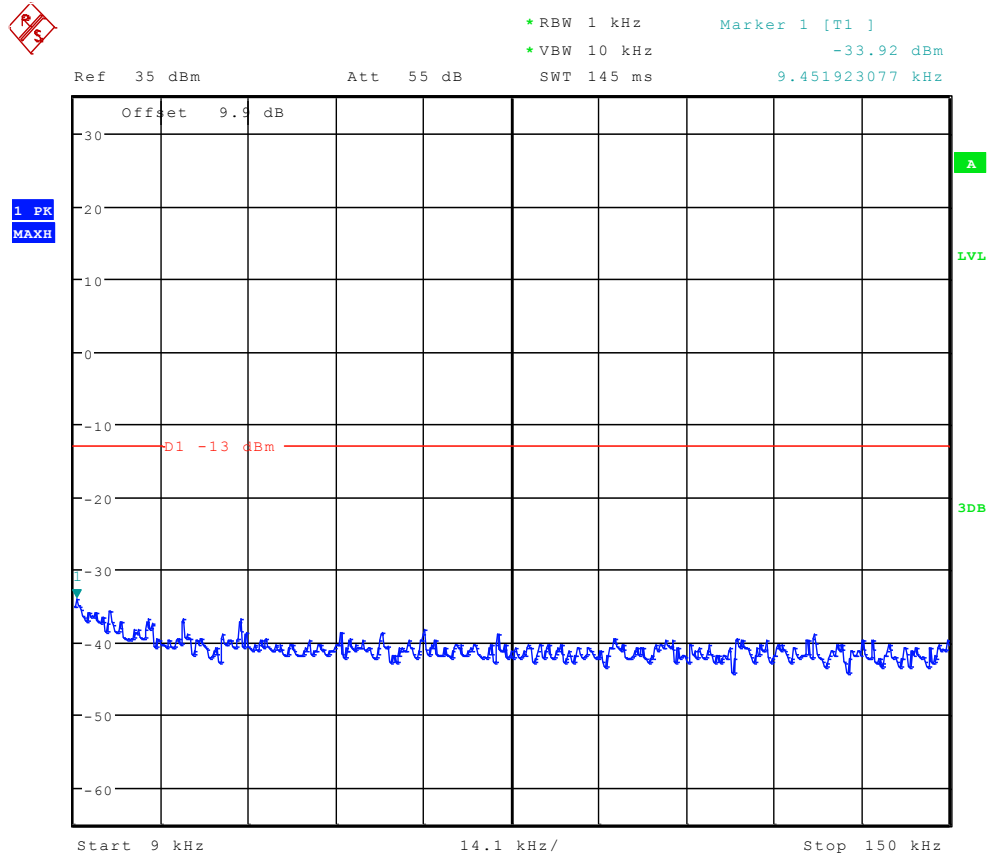
Date: 5.MAR.2012 10:37:26



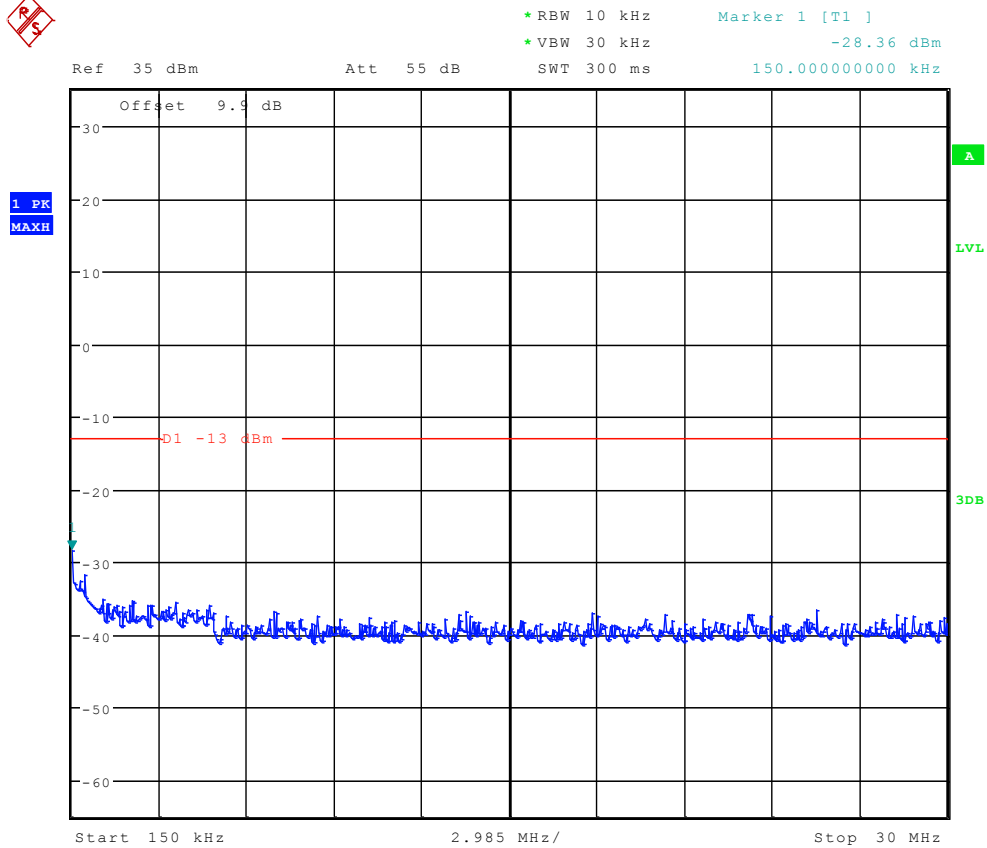
Date: 5.MAR.2012 10:38:10



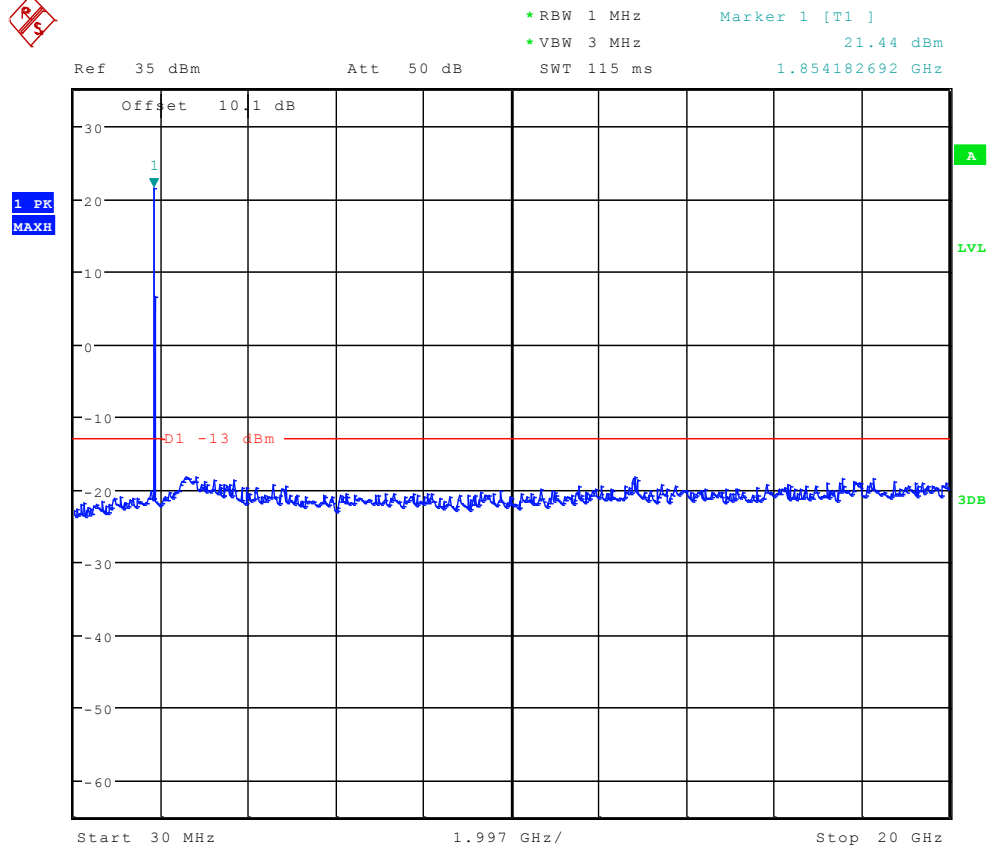
## Channel 9400



Date: 5.MAR.2012 10:36:57



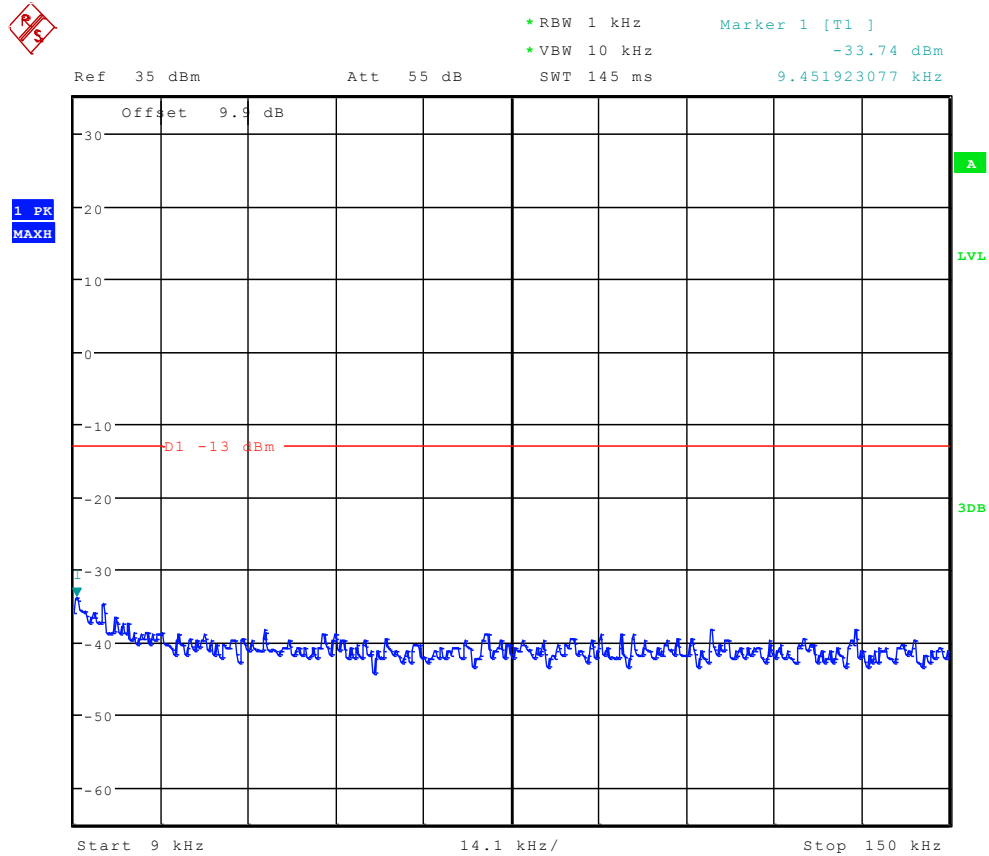
Date: 5.MAR.2012 10:37:40



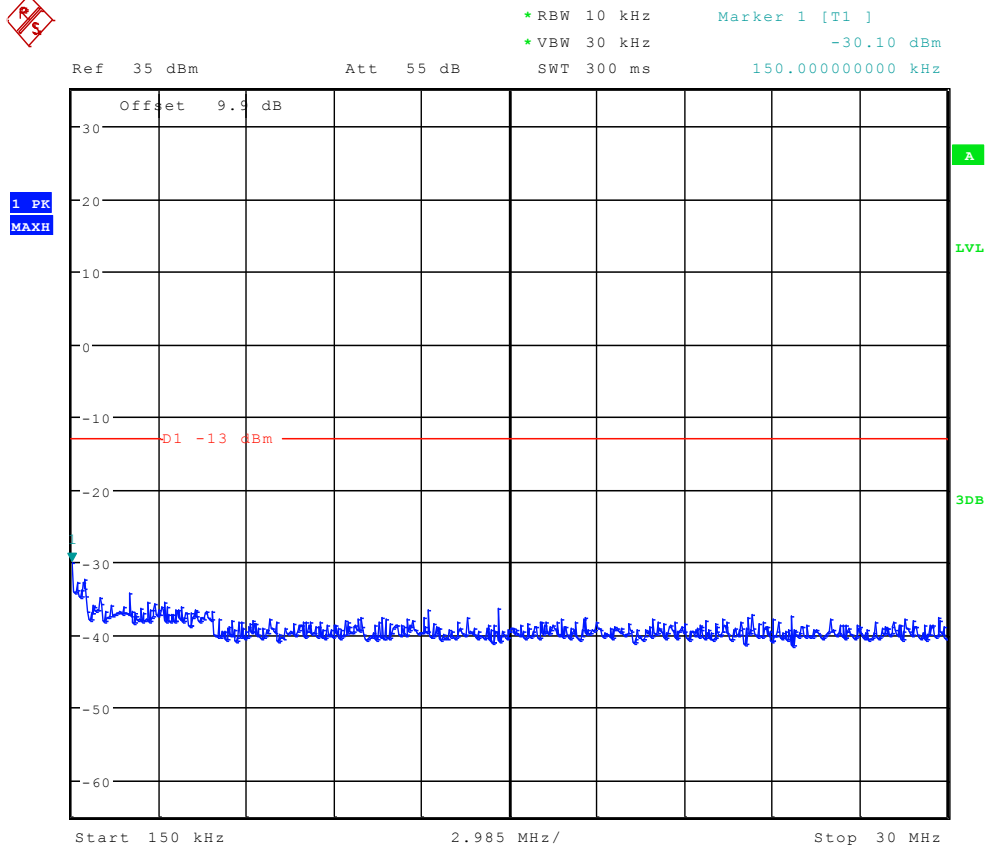
Date: 5.MAR.2012 10:38:25



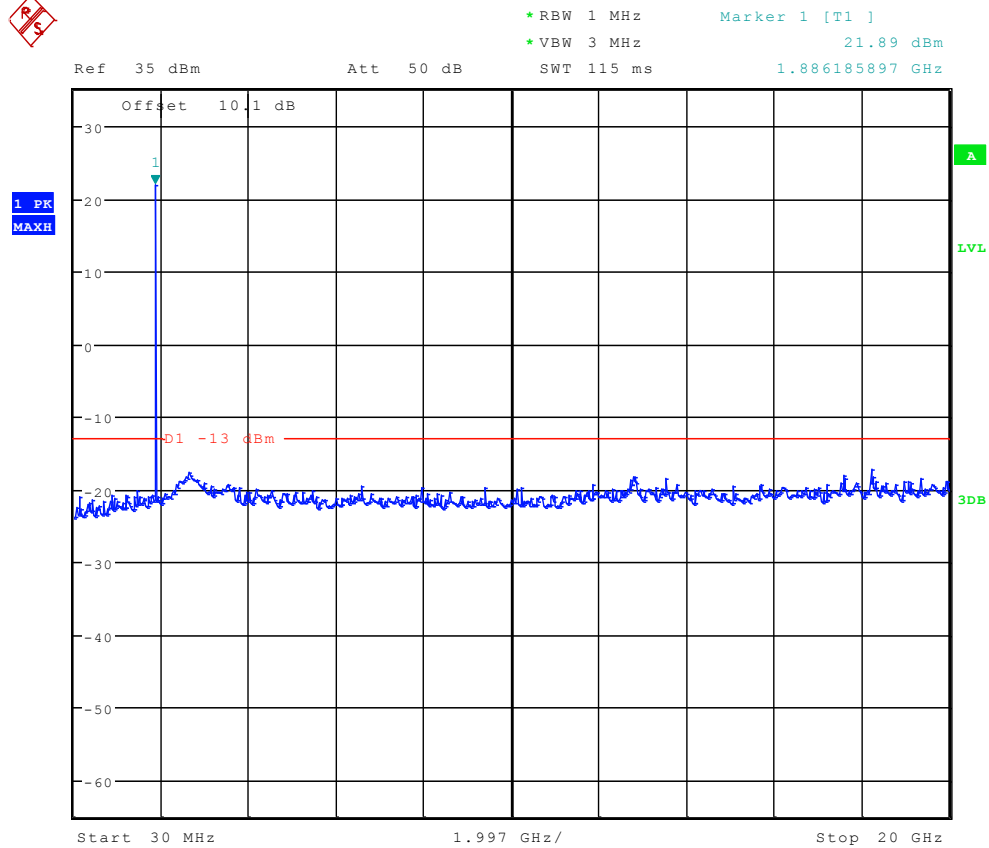
## Channel 9538



Date: 5.MAR.2012 10:37:11



Date: 5.MAR.2012 10:37:55



Date: 5.MAR.2012 10:38:39

The END



## **Appendix F**

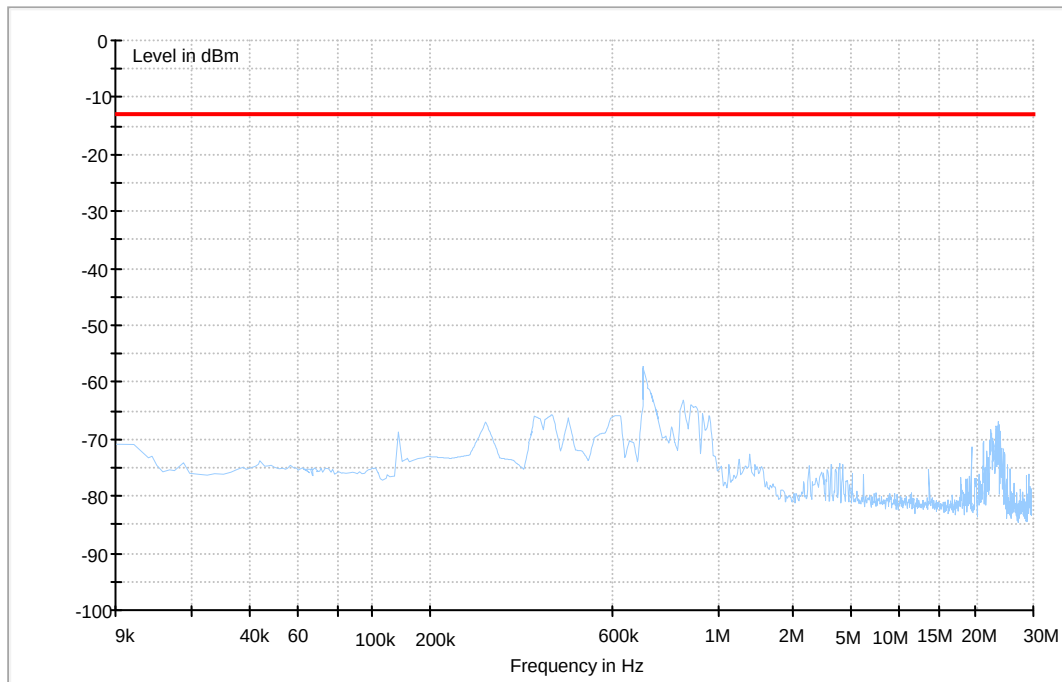
# **Field Strength of Spurious Emissions**

According to FCC Part 2.1053 & Part24.238



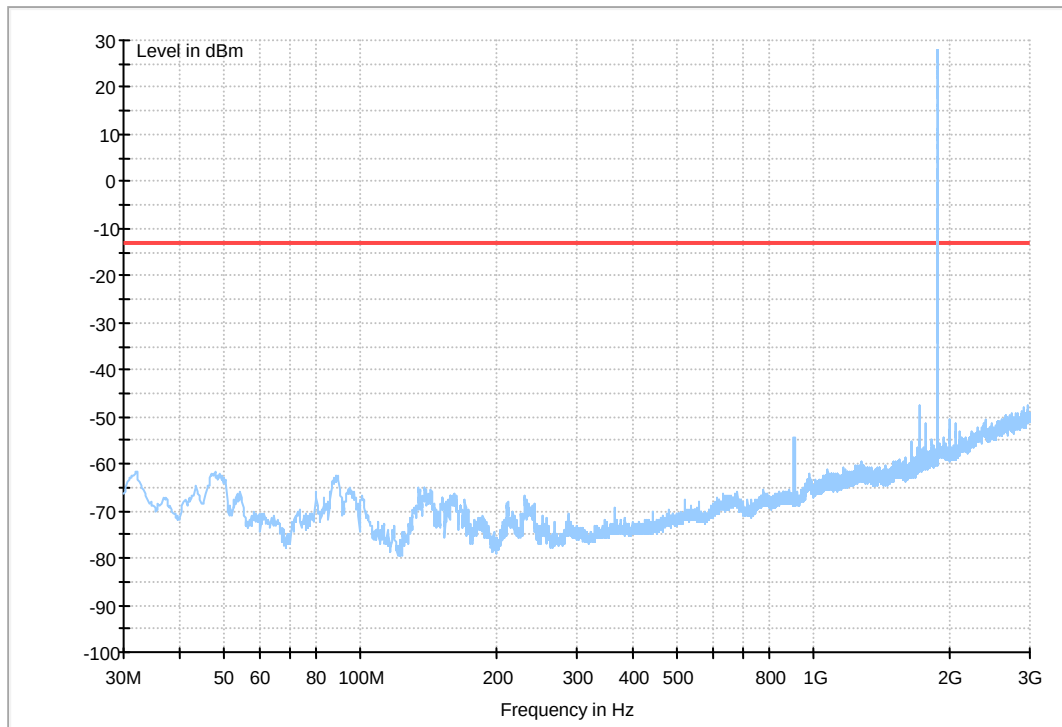
## GSM 1900

Traffic Mode (9kHz-30MHz)



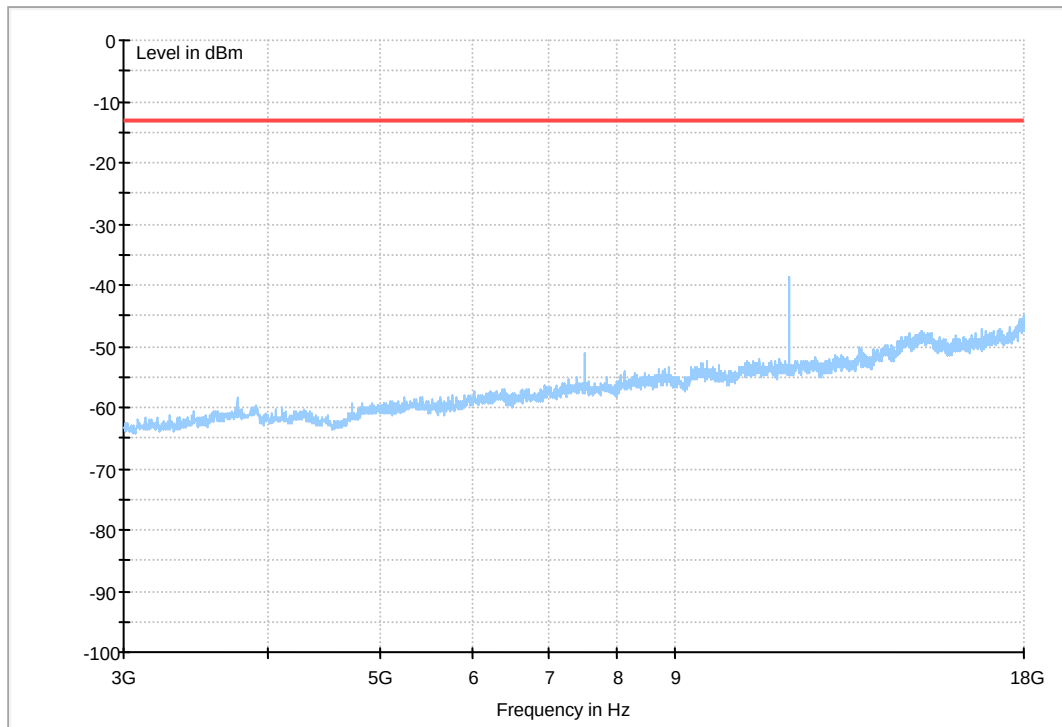


## Traffic Mode (30MHz-3GHz)



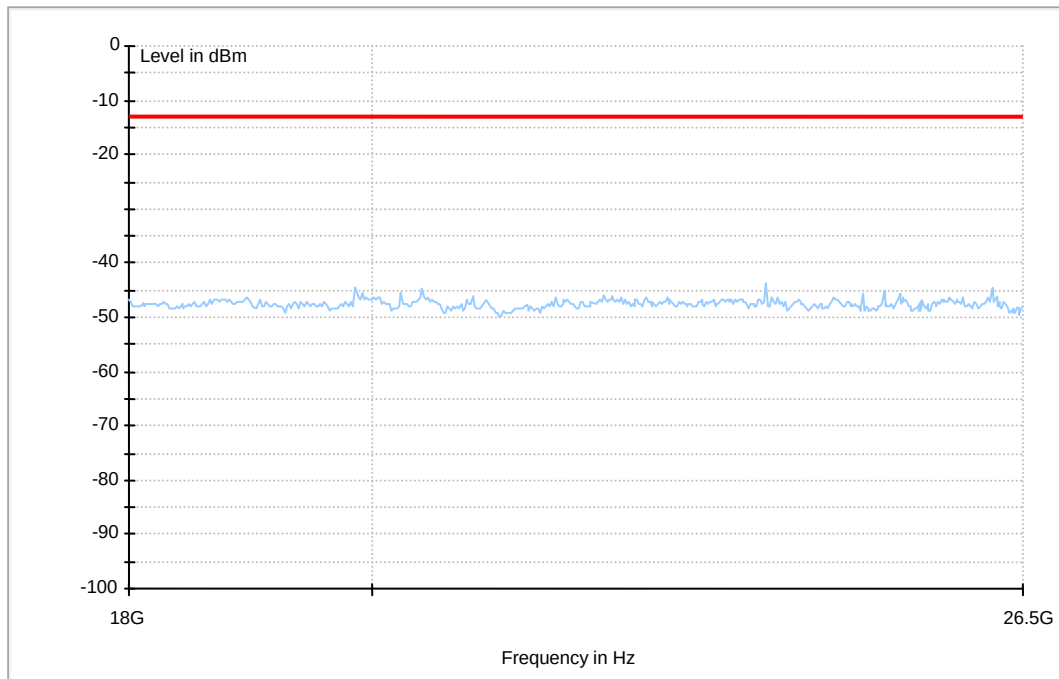


## Traffic Mode (3GHz-18GHz)





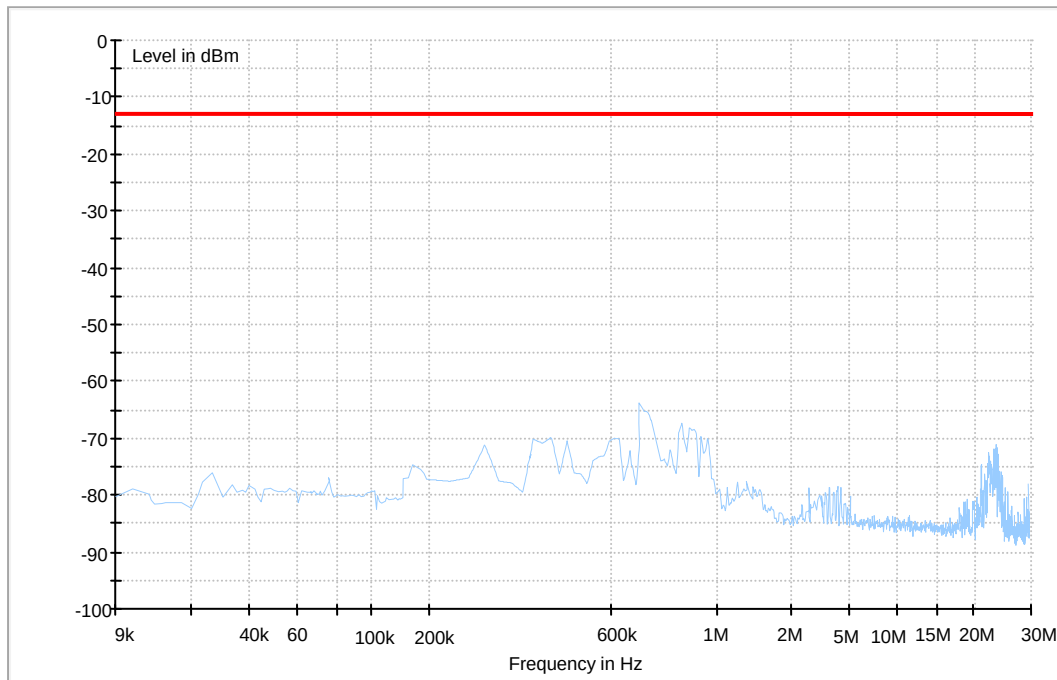
### Traffic Mode (18GHz-26.5GHz)





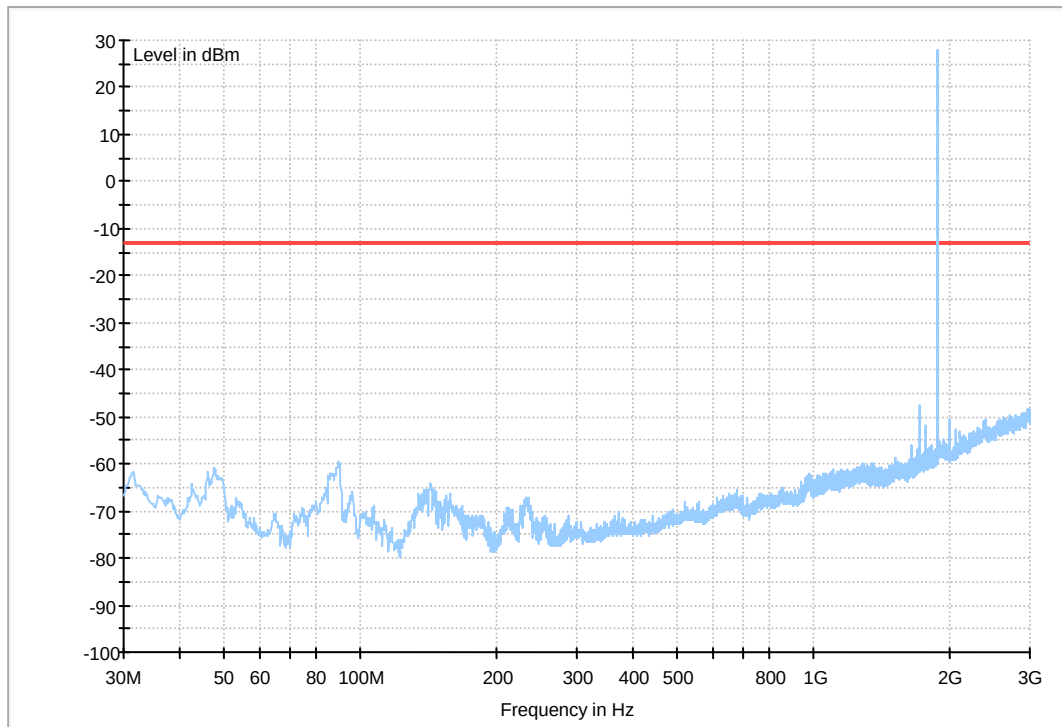
## GPRS1900

Traffic Mode (9kHz-30MHz)



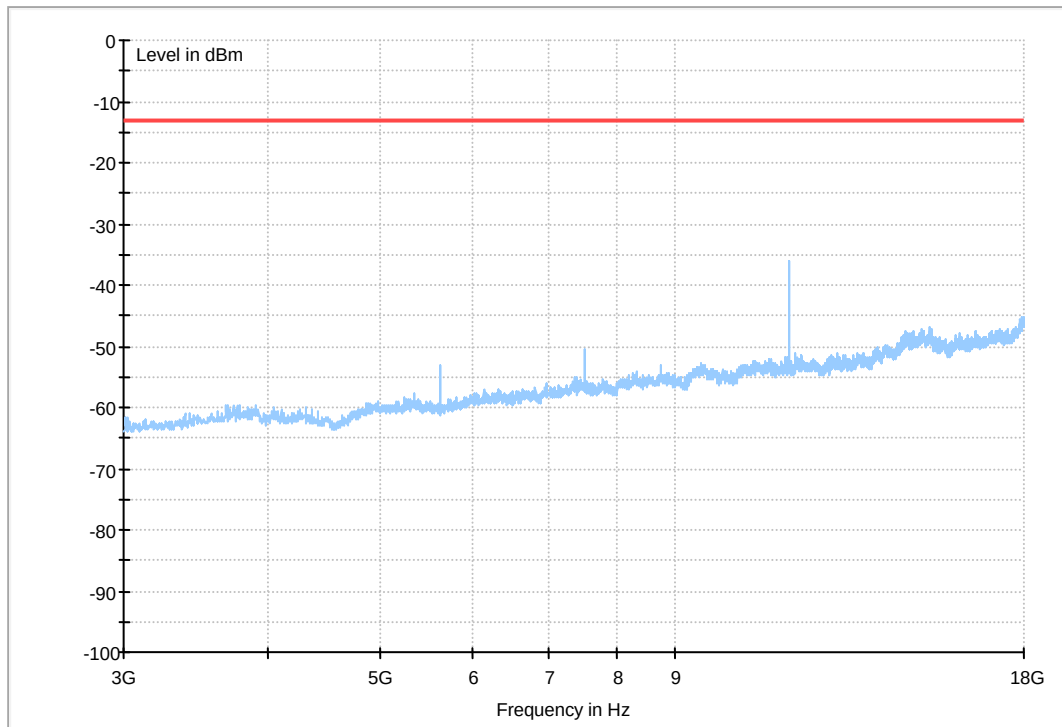


## Traffic Mode (30MHz-3GHz)



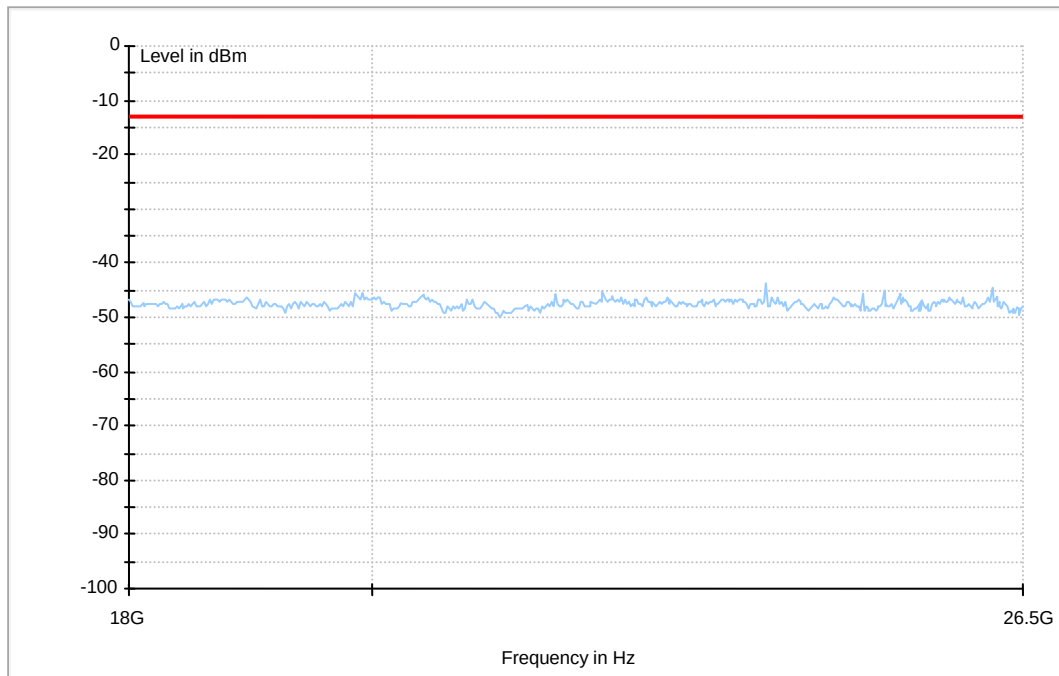


## Traffic Mode (3GHz-18GHz)





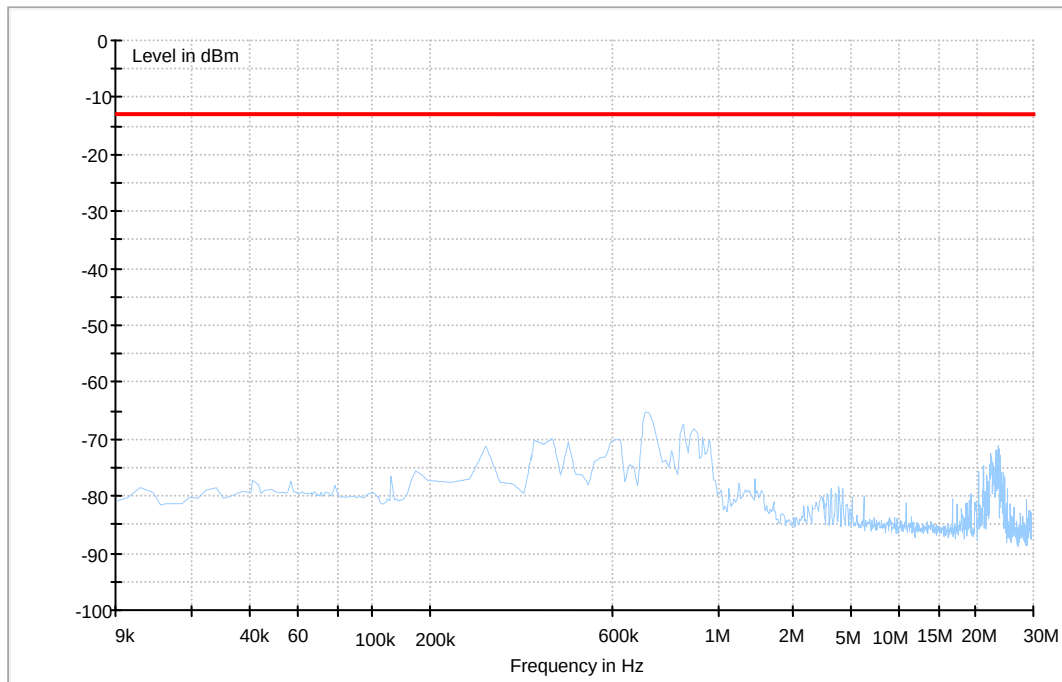
### Traffic Mode (18GHz-26.5GHz)





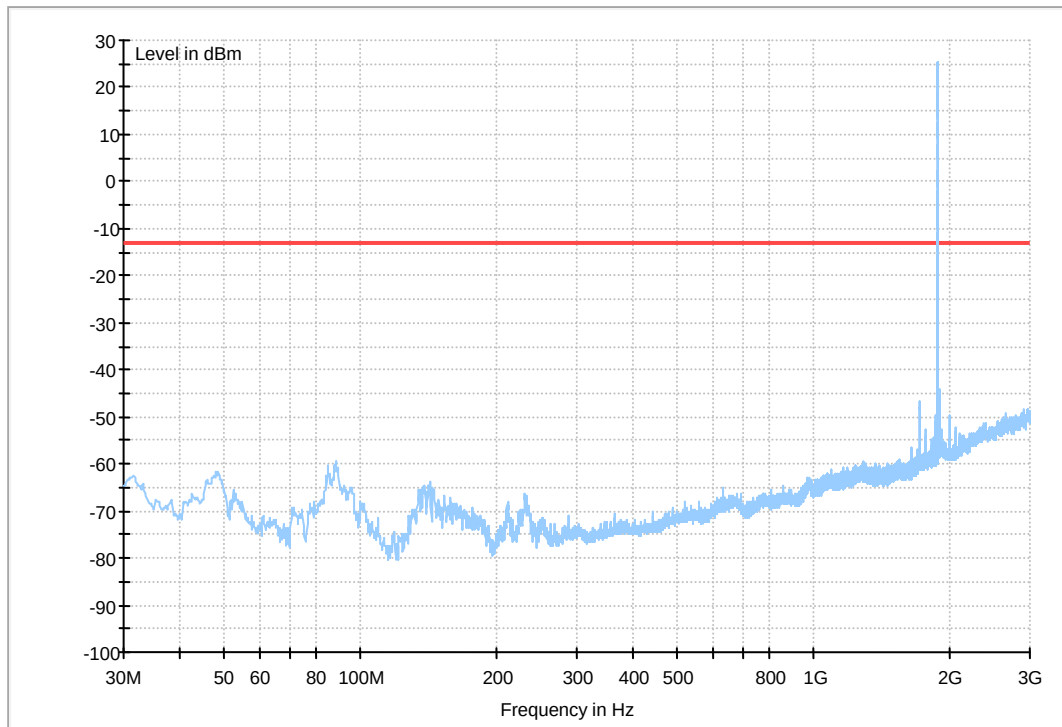
## EDGE 1900

Traffic Mode (9kHz-30MHz)



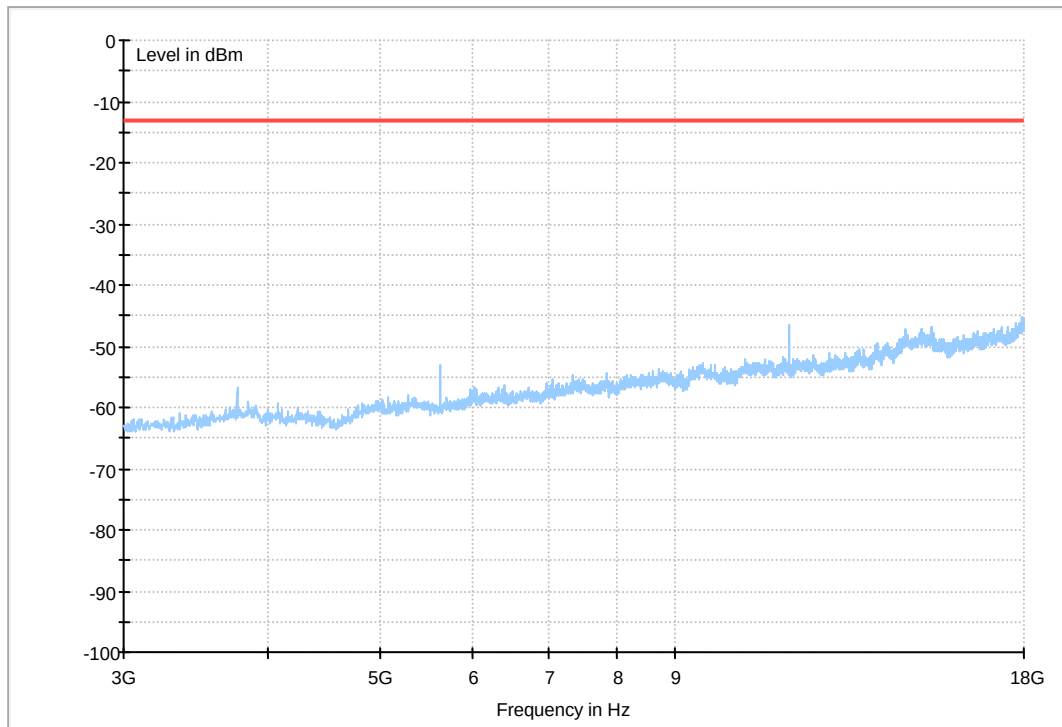


## Traffic Mode (30MHz-3GHz)



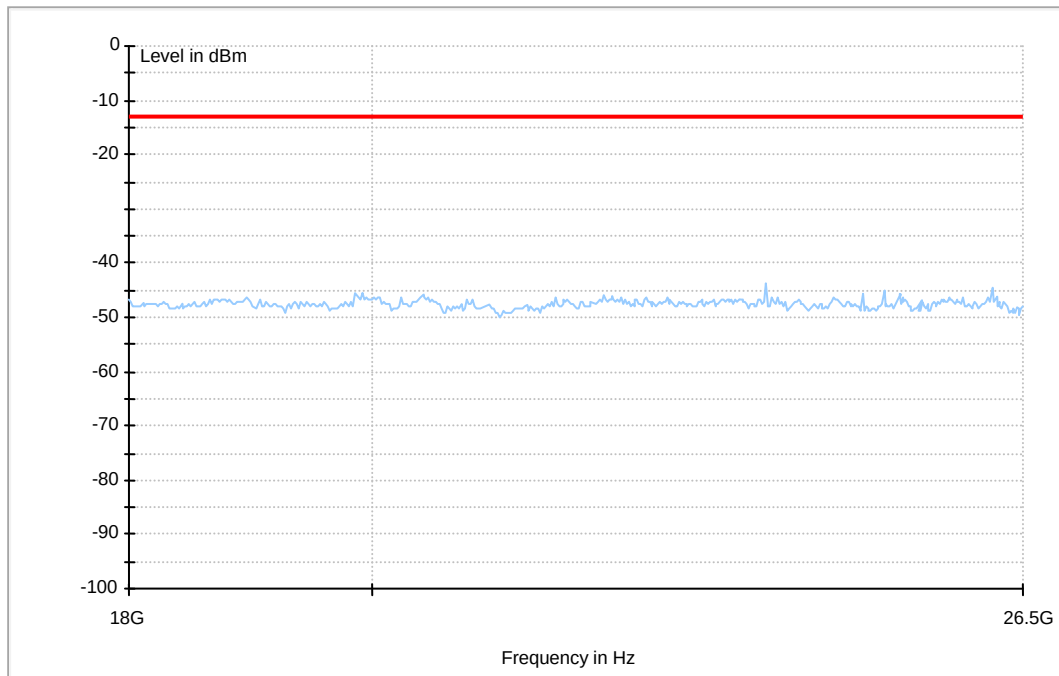


## Traffic Mode (3GHz-18GHz)





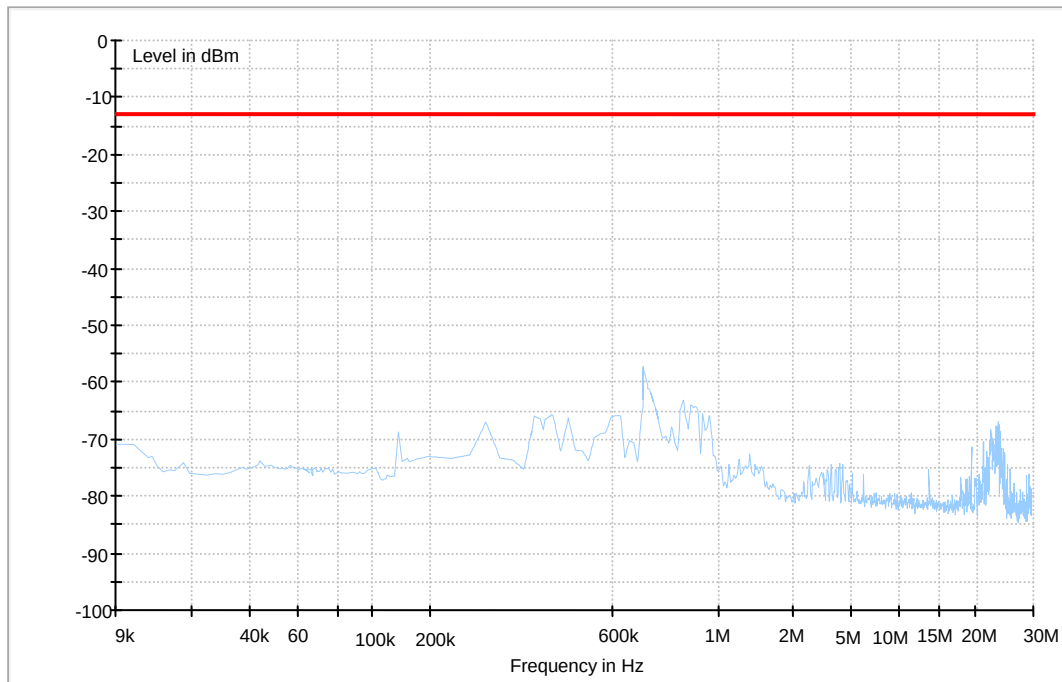
### Traffic Mode (18GHz-26.5GHz)





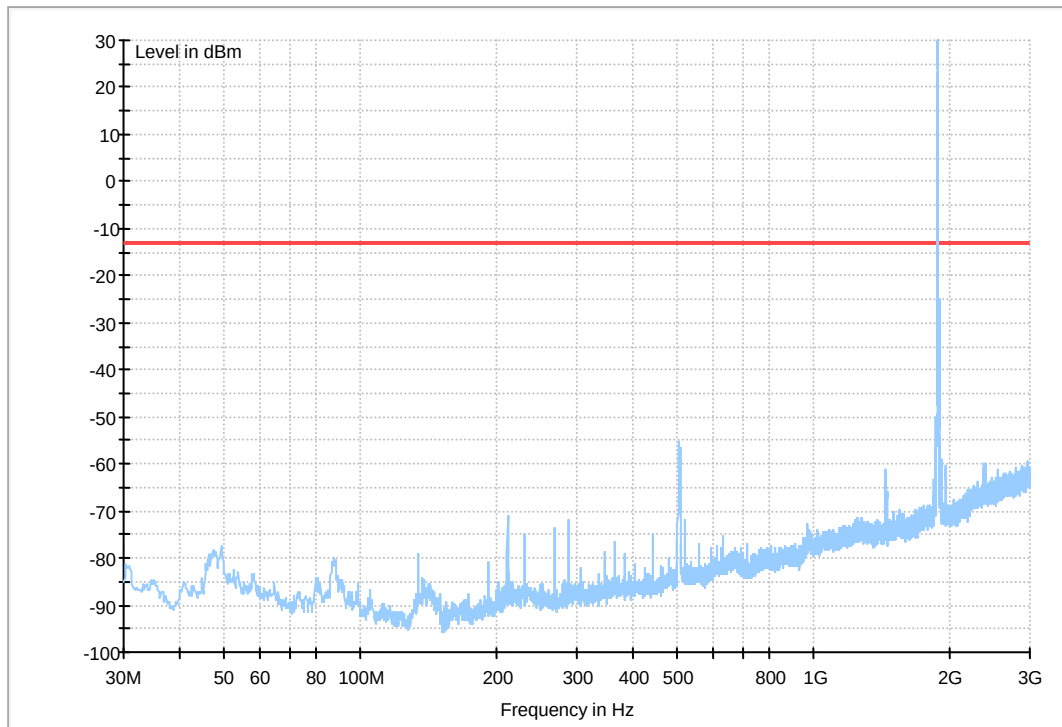
## WCDMA 1900

Traffic Mode (9kHz-30MHz)



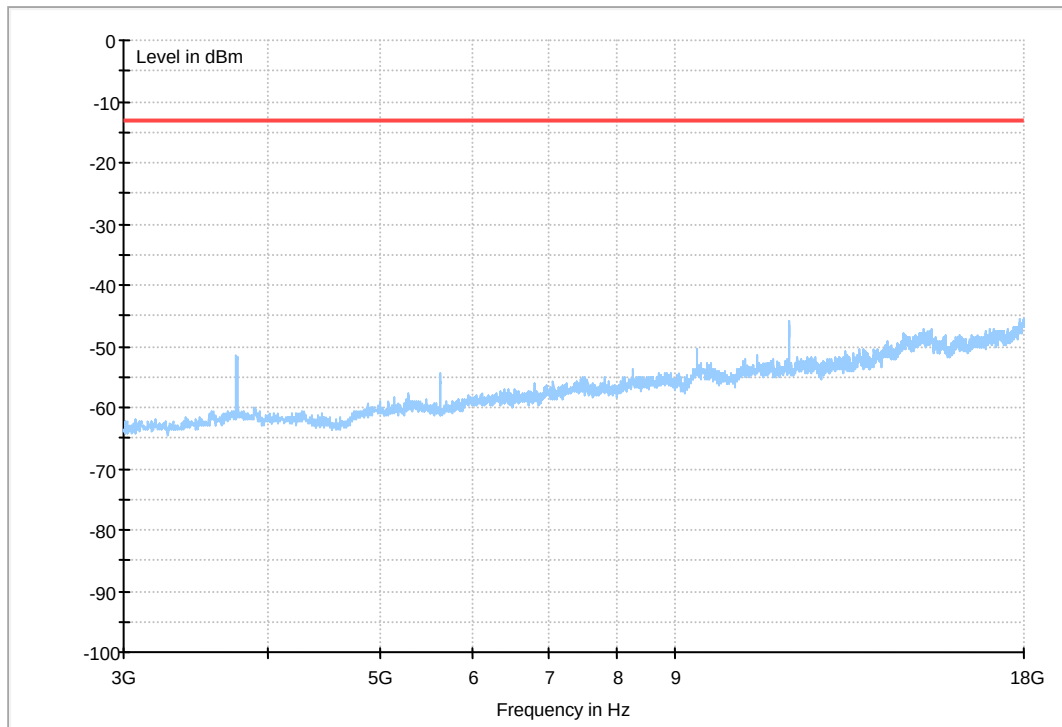


## Traffic Mode (30MHz-3GHz)



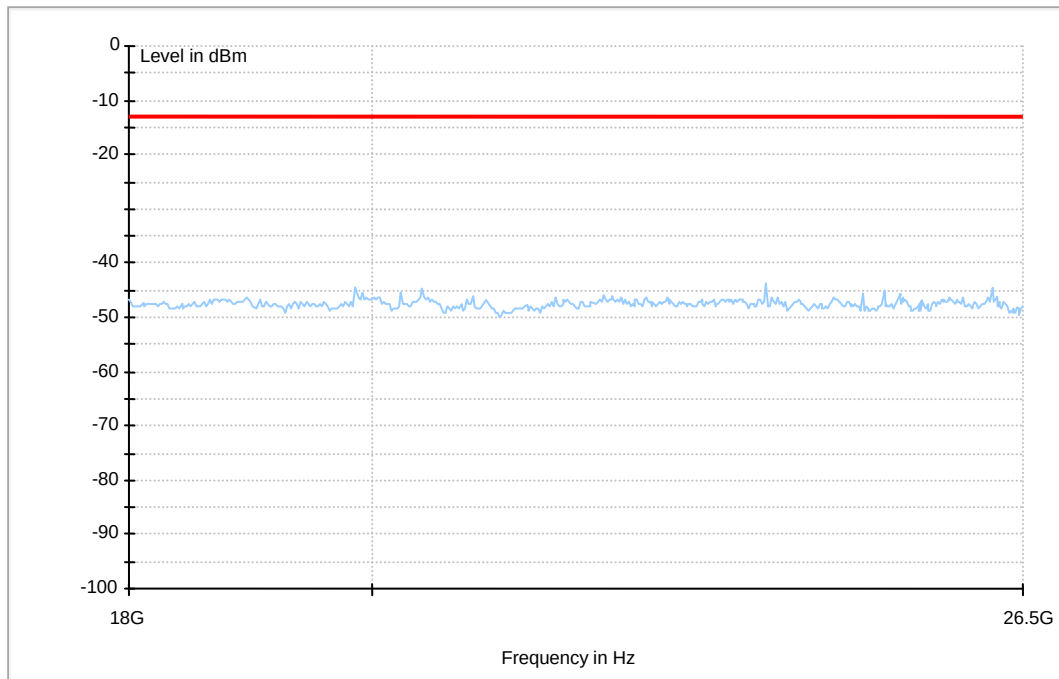


## Traffic Mode (3GHz-18GHz)





### Traffic Mode (18GHz-26.5GHz)



The END



## **Appendix G**

### **Frequency Stability**

According to FCC Part 2.1055& Part 24.235



## Frequency Error vs. Temperature:

| Test Mode | RF Ch. | Volt. | Temp.  | Freq. Error [Hz] | Freq. vs. rated [ppm] | Freq. vs. 20 °C [ppm] | Limit [ppm] | Verdict |
|-----------|--------|-------|--------|------------------|-----------------------|-----------------------|-------------|---------|
| TM 1      | M      | 100%  | -30 °C | 13               | 0.006915              | ---                   | ±2.5        | Pass    |
|           |        |       | -20 °C | 18               | 0.009574              | ---                   | ±2.5        | Pass    |
|           |        |       | -10 °C | -13              | -0.00691              | ---                   | ±2.5        | Pass    |
|           |        |       | 0 °C   | 11               | 0.005851              | ---                   | ±2.5        | Pass    |
|           |        |       | 10 °C  | 17               | 0.009043              | ---                   | ±2.5        | Pass    |
|           |        |       | 20 °C  | -12              | -0.00638              | ---                   | ±2.5        | Pass    |
|           |        |       | 30 °C  | -14              | -0.00745              | ---                   | ±2.5        | Pass    |
|           |        |       | 40 °C  | 14               | 0.007447              | ---                   | ±2.5        | Pass    |
|           |        |       | 50 °C  | -16              | -0.00851              | ---                   | ±2.5        | Pass    |
| TM 2      | M      | 100%  | -30 °C | 12               | 0.006383              | ---                   | ±2.5        | Pass    |
|           |        |       | -20 °C | -15              | -0.00798              | ---                   | ±2.5        | Pass    |
|           |        |       | -10 °C | 12               | 0.006383              | ---                   | ±2.5        | Pass    |
|           |        |       | 0 °C   | -16              | -0.00851              | ---                   | ±2.5        | Pass    |
|           |        |       | 10 °C  | 12               | 0.006383              | ---                   | ±2.5        | Pass    |
|           |        |       | 20 °C  | 13               | 0.006915              | ---                   | ±2.5        | Pass    |
|           |        |       | 30 °C  | -10              | -0.00532              | ---                   | ±2.5        | Pass    |
|           |        |       | 40 °C  | 13               | 0.006915              | ---                   | ±2.5        | Pass    |
|           |        |       | 50 °C  | 13               | 0.006915              | ---                   | ±2.5        | Pass    |
| TM 3      | M      | 100%  | -30 °C | 9                | 0.004787              | ---                   | ±2.5        | Pass    |
|           |        |       | -20 °C | 13               | 0.006915              | ---                   | ±2.5        | Pass    |
|           |        |       | -10 °C | -11              | -0.00585              | ---                   | ±2.5        | Pass    |
|           |        |       | 0 °C   | 10               | 0.005319              | ---                   | ±2.5        | Pass    |
|           |        |       | 10 °C  | -20              | -0.01064              | ---                   | ±2.5        | Pass    |
|           |        |       | 20 °C  | -19              | -0.01011              | ---                   | ±2.5        | Pass    |
|           |        |       | 30 °C  | -12              | -0.00638              | ---                   | ±2.5        | Pass    |
|           |        |       | 40 °C  | 11               | 0.005851              | ---                   | ±2.5        | Pass    |
|           |        |       | 50 °C  | -16              | -0.00851              | ---                   | ±2.5        | Pass    |



## Frequency Error vs. Voltage:

| Test Mode | RF Ch. | Temp. | Volt.[V] | Freq. Error [Hz] | Freq. vs. rated [ppm] | Freq. vs. 20 °C [ppm] | Limit [ppm] | Verdict |
|-----------|--------|-------|----------|------------------|-----------------------|-----------------------|-------------|---------|
| TM 1      | M      | 20 °C | 3.6      | 15               | 0.007979              | ---                   | ±2.5        | Pass    |
|           |        |       | 3.7      | 14               | 0.007447              | ---                   | ±2.5        | Pass    |
|           |        |       | 4.2      | 9                | 0.004787              | ---                   | ±2.5        | Pass    |
| TM 2      | M      | 20 °C | 3.6      | -13              | -0.00691              | ---                   | ±2.5        | Pass    |
|           |        |       | 3.7      | -17              | -0.00904              | ---                   | ±2.5        | Pass    |
|           |        |       | 4.2      | 12               | 0.006383              | ---                   | ±2.5        | Pass    |
| TM 3      | M      | 20 °C | 3.6      | -19              | -0.01011              | ---                   | ±2.5        | Pass    |
|           |        |       | 3.7      | 14               | 0.007447              | ---                   | ±2.5        | Pass    |
|           |        |       | 4.2      | -16              | -0.00851              | ---                   | ±2.5        | Pass    |

The END