

## FCC Part 22/24 Compliance Test Report

|                                                         |                                                                                                                                                                                                                                                      |                                   |                                                                                                                       |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Test Report no.:</b>                                 | Bej_FCC_0645_08.doc                                                                                                                                                                                                                                  | <b>Date of Report:</b>            | 2006-11-21                                                                                                            |
| <b>Number of pages:</b>                                 | 12                                                                                                                                                                                                                                                   | <b>Customer's Contact person:</b> | Jukka Pekkala                                                                                                         |
| <b>Testing laboratory:</b>                              | TCC Nokia Beijing Laboratory<br>Nokia Tower<br>Pacific Century Place 2A<br>Gong Ti Bei Lu<br>Chaoyang District<br>100027 BEIJING, PRC<br>Tel. +86 10 65392828<br>Fax. +86 10 65393838                                                                | <b>Customer:</b>                  | Nokia Corporation<br>Lise Meitner Strasse 10<br>89081 ULM<br>GERMANY<br>Tel. +49 731 1754 0<br>Fax. +49 731 1754 6800 |
| <b>FCC listing no.:</b>                                 | 884453                                                                                                                                                                                                                                               |                                   |                                                                                                                       |
| <b>IC recognition no.:</b>                              | 4917                                                                                                                                                                                                                                                 |                                   |                                                                                                                       |
| <b>Tested devices/ accessories:</b>                     | <b>Phone RM-222, Battery BL-4C, AC-charger AC- 3, Headset HS-47</b>                                                                                                                                                                                  |                                   |                                                                                                                       |
| <b>FCC ID:</b>                                          | PPIRM-222                                                                                                                                                                                                                                            | <b>IC:</b>                        | 661U-RM222                                                                                                            |
| <b>Supplement reports:</b>                              | -                                                                                                                                                                                                                                                    |                                   |                                                                                                                       |
| <b>Testing has been carried out in accordance with:</b> | CFR 47, FCC rules Parts 22 and 24, TIA-603-B-2002 and IC standards RSS-GEN, RSS-132 and RSS-133. Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".        |                                   |                                                                                                                       |
| <b>Documentation:</b>                                   | The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia. |                                   |                                                                                                                       |
| <b>Test Results:</b>                                    | <b>The EUT complies with the requirements in respect of all parameters subject to the test.</b><br>The test results relate only to devices specified in this document.                                                                               |                                   |                                                                                                                       |
| <b>Date and signature for the contents:</b>             |                                                                                                                                                                                                                                                      |                                   |                                                                                                                       |

Yin Hongpeng, Engineer

## 1. Summary for FCC Part 22/24 Compliance Test Report

|                               |                                                           |
|-------------------------------|-----------------------------------------------------------|
| Date of receipt               | 2006-11-13                                                |
| Testing completed             | 2006-11-17                                                |
| The customer's contact person | Jukka Pekkala                                             |
| Test Plan referred to         | T:\Projects\RM-222\TestPlan_RS\RS_testplan_for_RM-222.xls |
| Notes                         | -                                                         |
| Document name                 | T:\Projects\RM-222\EMC\Results\FCC\Bej_FCC_0645_08.doc    |

### 1.1. EUT and Accessory Information

The EUT is a 3-band (GSM850/1800/1900) mobile phone. The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

| Product    | Type   | SN                          | HW   | MV | SW       | DUT   |
|------------|--------|-----------------------------|------|----|----------|-------|
| Phone      | RM-222 | 004400931637001             | 0365 | -  | V pc3.92 | 50393 |
| Battery    | BL-4C  | 0670386418157N324110100339  | -    | -  | -        | 50386 |
| AC-charger | AC-3   | 3997915472051200083;0675370 | -    | -  | -        | 50387 |
| Headset    | HS-47  | 350853639101                | -    | -  | -        | 50388 |

### 1.2. Summary of Test Results

#### GSM 850:

| Section in CFR 47     | Section in RSS-GEN or RSS-132 | Name of the test                           | Result |
|-----------------------|-------------------------------|--------------------------------------------|--------|
| §2.1046(a), 22.913(a) | 4.6, 4.4                      | Conducted RF output power                  | NP     |
| §22.913(a)            | 4.6, 4.4                      | Radiated RF output power                   | PASSED |
| §2.1049(h)            | 4.4.1                         | 99 % occupied bandwidth                    | NP     |
| §22.917(a)            | 4.7, 4.5                      | Band edge compliance                       | PASSED |
| §22.917(a), §2.1051   | 4.7, 4.5                      | Spurious emissions at antenna terminals    | NP     |
| §22.917(a), §2.1053   | 4.7, 4.5                      | Spurious radiated emissions                | NP     |
| §2.1055(a)            | 4.5, 4.3                      | Frequency stability, temperature variation | NP     |
| §2.1055(d)            | 4.5, 4.3                      | Frequency stability, voltage variation     | NP     |

#### GSM 1900:

| Section in CFR 47   | Section in RSS-133 | Name of the test                           | Result |
|---------------------|--------------------|--------------------------------------------|--------|
| §2.1046(a)          | 6.2                | Conducted RF output power                  | NP     |
| §24.232(b)          | 6.2                | Radiated RF output power                   | PASSED |
| §2.1049(h)          | 5.6                | 99 % occupied bandwidth                    | NP     |
| §24.238(a)          | 6.3                | Band edge compliance                       | PASSED |
| §24.238(a), §2.1051 | 6.3                | Spurious emissions at antenna terminals    | NP     |
| §24.238(a), §2.1053 | 6.3                | Spurious radiated emissions                | NP     |
| §2.1055(a)          | 7                  | Frequency stability, temperature variation | NP     |
| §2.1055(d)          | 7                  | Frequency stability, voltage variation     | NP     |

PASSED  
FAILED  
NP

The EUT complies with the essential requirements in the standard.  
The EUT does not comply with the essential requirements in the standard.  
The test was not performed by the TCC Nokia Beijing Laboratory.

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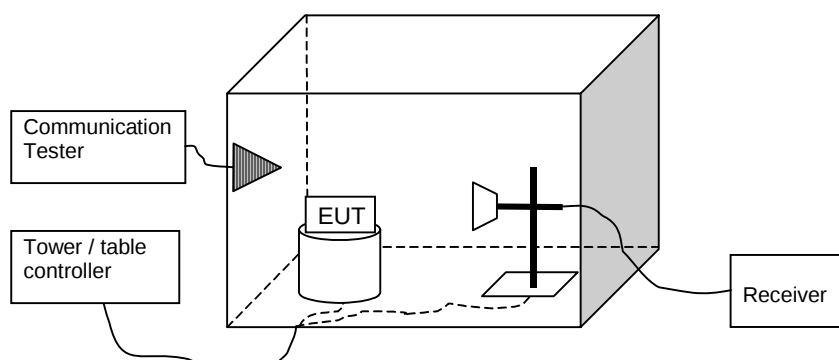
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## 2. Radiated RF output power

(FCC §22.913(a), §24.232(b), RSS-GEN 4.6, RSS-132 4.4, RSS-133 6.2)

|                                                         |                                            |
|---------------------------------------------------------|--------------------------------------------|
| <b>EUT with DUT number</b>                              | RM-222 (50393)                             |
| <b>Accessories with DUT numbers</b>                     | BL-4C (50386), AC-3 (50387), HS-47 (50388) |
| <b>Operation Voltage [V] / [Hz]</b>                     | 220 / 50                                   |
| <b>Result</b>                                           | PASSED                                     |
| <b>Remarks</b>                                          | -                                          |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [mBar]</b> | 27 / 14 / 1013                             |
| <b>Date of measurements</b>                             | 2006-11-15                                 |
| <b>Measured by</b>                                      | Yin Hongpeng                               |

### 2.1. Test setup



### 2.2. Test method and limit

The measurement is made according to TIA-603-B-2002 as follows:

The measurement is performed in the Anechoic Chamber with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system. The turntable is rotated 360 degrees and this is repeated for both horizontal and vertical receive antenna polarizations.

The EUT is placed on a nonconductive plate at 170 cm height.

The substitution method is used. Substitution values at each frequencies are measured beforehand and saved to the test software.

The substitution corrections are obtained as described below:

$$A_{SUBST} = P_{SUBST\_TX} - P_{SUBST\_RX} - L_{SUBST\_CABLES} + G_{SUBST\_TX\_ANT}$$

Where  $A_{SUBST}$  is the final substitution correction including receive antenna gain.  $P_{SUBST\_TX}$  is signal generator level,  $P_{SUBST\_RX}$  is receiver level,  $L_{SUBST\_CABLES}$  is cable losses including both TX and RX cables and  $G_{SUBST\_TX\_ANT}$  is substitution antenna gain.

The measurement results are obtained as described below:

$$P [dBm] = P_{MEAS} + A_{TOT}$$

Where  $P_{MEAS}$  is receiver reading in dBm and  $A_{TOT}$  is total correction factor including cable loss and substitution correction ( $A_{TOT} = L_{CABLES} + A_{SUBST}$ ).

Limits for radiated RF output power measurements

| Frequency range [MHz] | Limit [W] | Limit [dBm] |
|-----------------------|-----------|-------------|
| 824 - 849             | 7         | 38.5        |
| 1710 - 1755           | 2         | 33          |
| 1850 - 1910           | 2         | 33          |

## 2.3. GSM 850 Test results

GSM mode

| Channel / $f_c$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarisation | Result |
|-----------------------|-----------|---------|------------------|----------------|--------------|--------|
| 128 / 824.2           | 29.70     | 0.933   | -6.3             | 36.00          | HORIZONTAL   | PASSED |
| 190 / 836.6           | 30.20     | 1.047   | -5.7             | 35.90          | HORIZONTAL   | PASSED |
| 251 / 848.8           | 30.20     | 1.047   | -5.7             | 35.90          | HORIZONTAL   | PASSED |

GPRS mode, 2 TX Slots

| Channel / $f_c$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarisation | Result |
|-----------------------|-----------|---------|------------------|----------------|--------------|--------|
| 128 / 824.2           | 25.70     | 0.372   | -10.3            | 36.00          | HORIZONTAL   | PASSED |
| 190 / 836.6           | 26.60     | 0.457   | -9.3             | 35.90          | HORIZONTAL   | PASSED |
| 251 / 848.8           | 27.00     | 0.501   | -8.9             | 35.90          | HORIZONTAL   | PASSED |

EGPRS mode, 2 TX Slots

| Channel / $f_c$ [MHz] | ERP [dBm] | ERP [W] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarisation | Result |
|-----------------------|-----------|---------|------------------|----------------|--------------|--------|
| 128 / 824.2           | 22.60     | 0.182   | -13.4            | 36.00          | HORIZONTAL   | PASSED |
| 190 / 836.6           | 21.80     | 0.151   | -14.1            | 35.90          | VERTICAL     | PASSED |
| 251 / 848.8           | 24.90     | 0.309   | -11.0            | 35.90          | HORIZONTAL   | PASSED |

## 2.4. GSM 1900 Test results

### GSM mode

| Channel / $f_c$ [MHz] | EIRP [dBm] | EIRP [W] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarisation | Result |
|-----------------------|------------|----------|------------------|----------------|--------------|--------|
| 512 / 1850.2          | 31.50      | 1.413    | -15.2            | 46.70          | VERTICAL     | PASSED |
| 661 / 1880.0          | 29.30      | 0.851    | -16.1            | 45.40          | HORIZONTAL   | PASSED |
| 810 / 1909.8          | 29.20      | 0.832    | -17.0            | 46.20          | HORIZONTAL   | PASSED |

### GPRS mode, 2 TX Slots

| Channel / $f_c$ [MHz] | EIRP [dBm] | EIRP [W] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarisation | Result |
|-----------------------|------------|----------|------------------|----------------|--------------|--------|
| 512 / 1850.2          | 28.80      | 0.759    | -17.9            | 46.70          | VERTICAL     | PASSED |
| 661 / 1880.0          | 28.90      | 0.776    | -16.5            | 45.40          | VERTICAL     | PASSED |
| 810 / 1909.8          | 28.00      | 0.631    | -18.2            | 46.20          | VERTICAL     | PASSED |

### EGPRS mode, 2 TX Slots

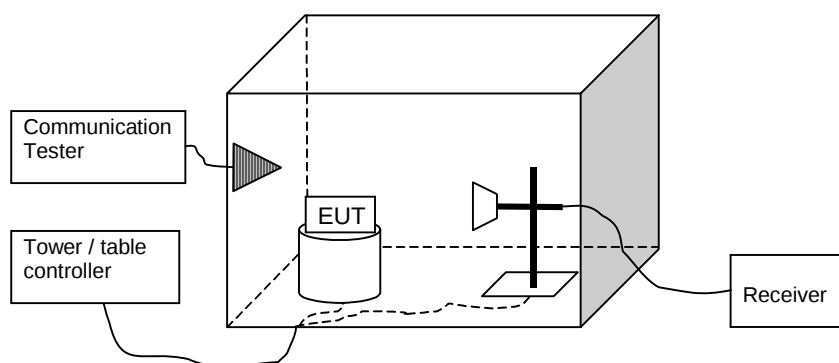
| Channel / $f_c$ [MHz] | EIRP [dBm] | EIRP [W] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarisation | Result |
|-----------------------|------------|----------|------------------|----------------|--------------|--------|
| 512 / 1850.2          | 27.70      | 0.589    | -19.0            | 46.70          | HORIZONTAL   | PASSED |
| 661 / 1880.0          | 26.00      | 0.398    | -19.4            | 45.40          | HORIZONTAL   | PASSED |
| 810 / 1909.8          | 27.60      | 0.575    | -18.6            | 46.20          | VERTICAL     | PASSED |

### 3. Band edge compliance

(FCC §22.917(a), 24.238(a), RSS-GEN 4.7, RSS-132 4.5, RSS-133 6.3)

|                                                         |                                            |
|---------------------------------------------------------|--------------------------------------------|
| <b>EUT with DUT number</b>                              | RM-222 (50393)                             |
| <b>Accessories with DUT numbers</b>                     | BL-4C (50386), AC-3 (50387), HS-47 (50388) |
| <b>Operation Voltage [V] / [Hz]</b>                     | 220 / 50                                   |
| <b>Result</b>                                           | PASSED                                     |
| <b>Remarks</b>                                          | -                                          |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [mBar]</b> | 27 / 14 / 1013                             |
| <b>Date of measurements</b>                             | 2006-11-15                                 |
| <b>Measured by</b>                                      | Yin Hongpeng                               |

#### 3.1. Test setup



#### 3.2. Test method and limit

The measurement is made according to FCC rules part 22 and 24 and IC standards RSS-GEN, RSS-132 and RSS-133.

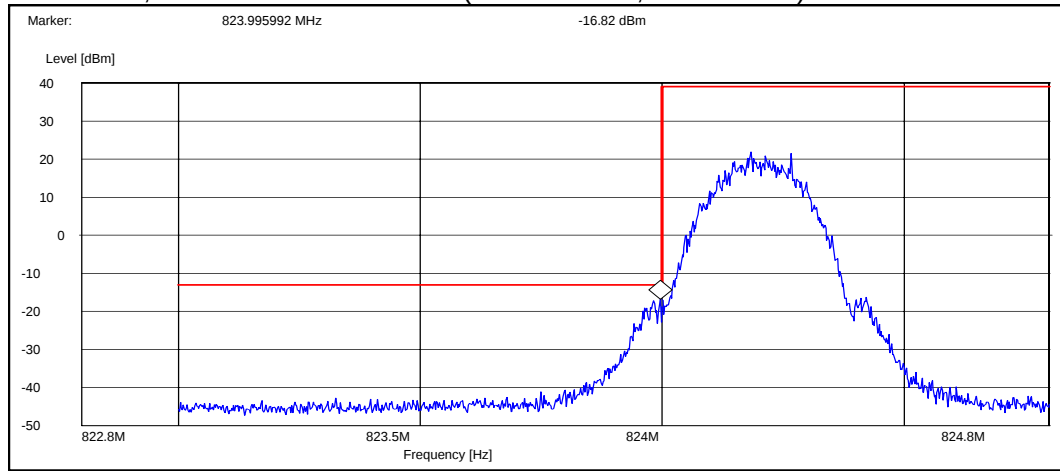
Limits for band edge compliance measurements

| <b>Operation band</b> | <b>Frequency range [MHz]</b> | <b>Limit [dBm]</b> |
|-----------------------|------------------------------|--------------------|
| GSM 850 / WCDMA 850   | Below 824 and above 849      | -13                |
| WCDMA 1700            | Below 1710 and above 1755    | -13                |
| GSM 1900 / WCDMA 1900 | Below 1850 and above 1910    | -13                |

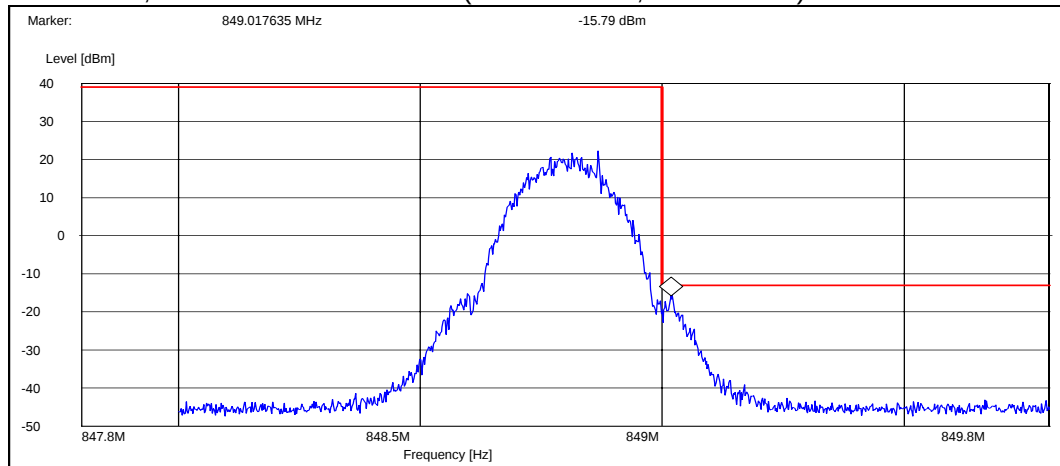
### 3.3. GSM 850 Test results

| Operation mode (TX on) | Channel / $f_c$ [MHz] | Level [dBm] |
|------------------------|-----------------------|-------------|
| GSM                    | 128 / 824.2           | -16.82      |
| GSM                    | 251 / 848.8           | -15.79      |
| EGPRS                  | 128 / 824.2           | -23.85      |
| EGPRS                  | 251 / 848.8           | -22.70      |

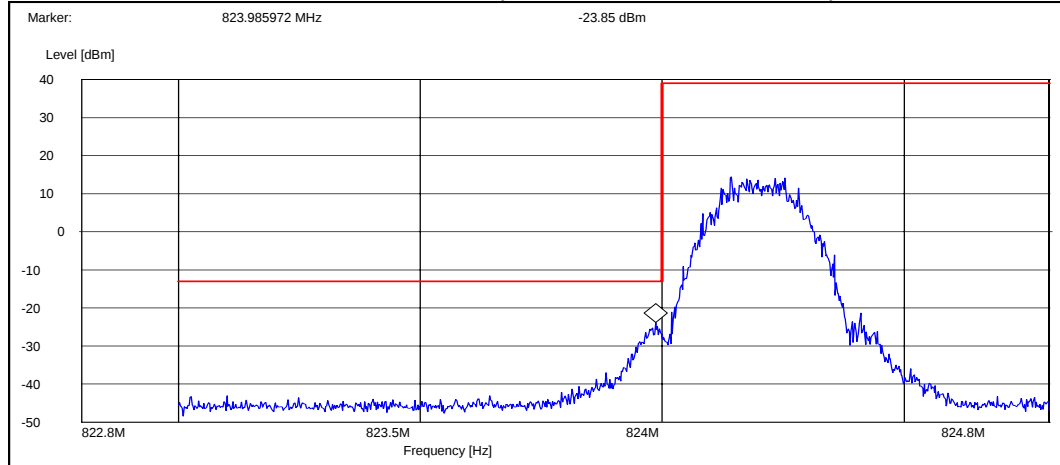
GSM mode, channel 128 / 824.2 MHz (Peak detector, RBW: 3 kHz)



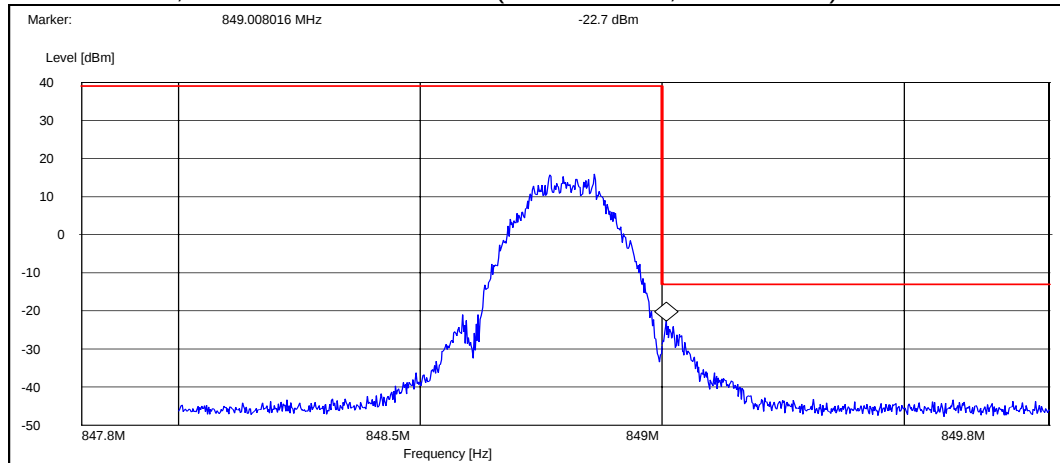
GSM mode, channel 251 / 848.8 MHz (Peak detector, RBW: 3 kHz)



EGPRS mode, channel 128 / 824.2 MHz (Peak detector, RBW: 3 kHz)



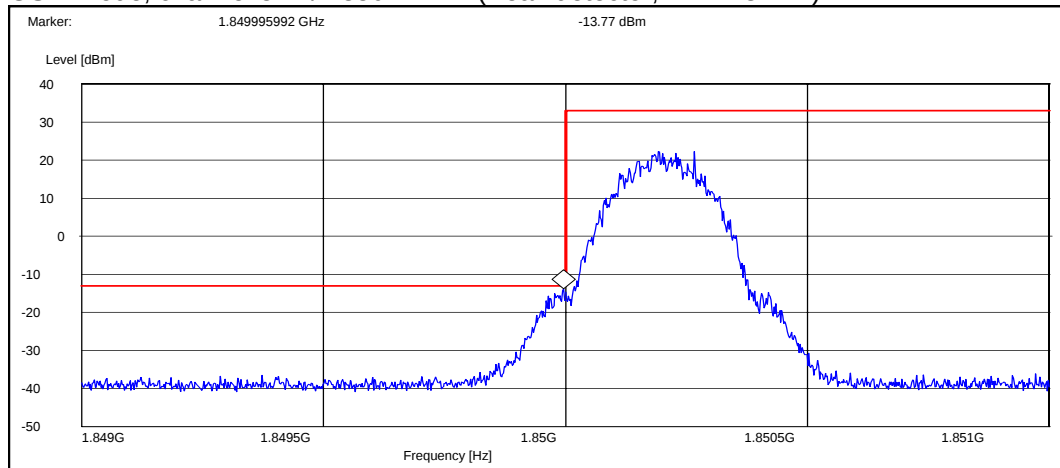
EGPRS mode, channel 251 / 848.8 MHz (Peak detector, RBW: 3 kHz)



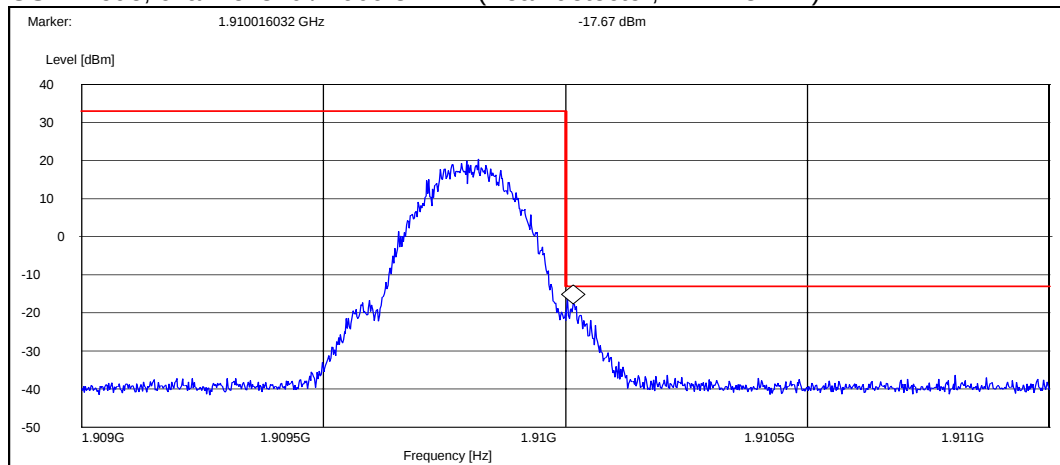
### 3.4. GSM 1900 Test results

| Operation mode (TX on) | Channel / $f_c$ [MHz] | Level [dBm] |
|------------------------|-----------------------|-------------|
| GSM                    | 512 / 1850.2          | -13.77      |
| GSM                    | 810 / 1909.8          | -17.67      |
| EGPRS                  | 512 / 1850.2          | -18.77      |
| EGPRS                  | 810 / 1909.8          | -21.64      |

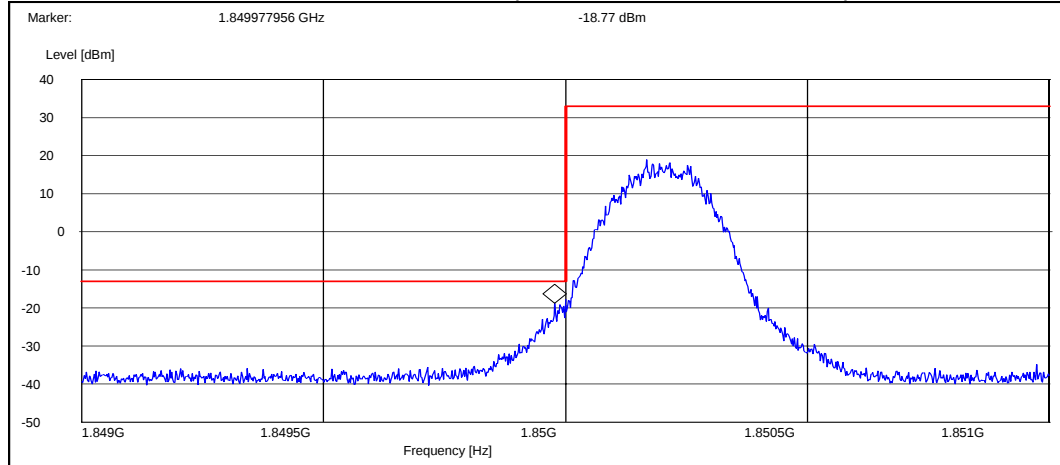
GSM mode, channel 512 / 1850.2 MHz (Peak detector, RBW: 3 kHz)



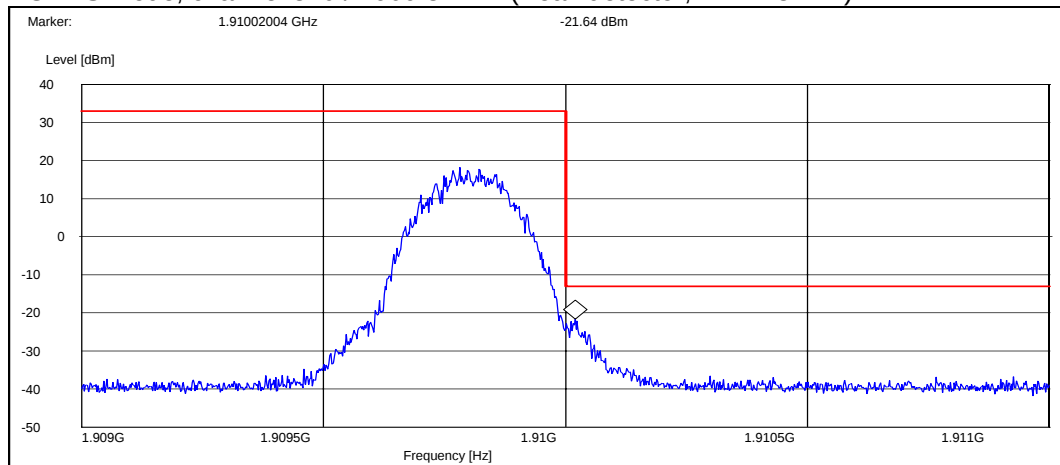
GSM mode, channel 810 / 1909.8 MHz (Peak detector, RBW: 3 kHz)



EGPRS mode, channel 512 / 1850.2 MHz (Peak detector, RBW: 3 kHz)



EGPRS mode, channel 810 / 1909.8 MHz (Peak detector, RBW: 3 kHz)



## 4. Test Equipment

### 4.1. Radiated measurements

| Eq. No     | Equipment                                     | Type                          | Manufacturer              | Used in |
|------------|-----------------------------------------------|-------------------------------|---------------------------|---------|
| BJPCPT0129 | Relay Unit                                    | TS-RSP                        | Rohde&Schwarz             | 22/24   |
| BJPCPT0130 | Relay Unit                                    | TS-RSP                        | Rohde&Schwarz             | 22/24   |
| BJPCPT0080 | Device Controller                             | EMCO2090                      | ETS-EMCO                  | 22/24   |
| BJPCTC0048 | RF Preamplifier 10MHz-3GHz<br>(Metal chassis) | AFS4-00100300-10-10P-4        | MITEQ                     | 22/24   |
| BJPCTC0007 | Ultra Broadband Antenna<br>30MHz-3000MHz      | HL562                         | Rohde&Schwarz             | 22/24   |
| BJPCPT0162 | Horn Antenna 1GHz-18GHz                       | HF906                         | Rohde&Schwarz             | 22/24   |
| BJPCTC0029 | Horn Antenna 1GHz-18GHz                       | HF906                         | Rohde&Schwarz             | 22/24   |
| BJPCTC0049 | RF preamplifier 3GHz-18GHz                    | BLMA-0118-1A-BT               | Rohde&Schwarz             | 22/24   |
| BJPCTC0046 | Shielding Enclosure                           | 3M Test Site                  | ETS-Lindgren              | 22/24   |
| BJPCTC0047 | Turntable                                     | Model 2088-1.23               | ETS-EMCO                  | 22/24   |
| BJPCPT0072 | EMI Test Receiver 20Hz-26.5GHz                | ESIB26                        | Rohde&Schwarz             | 22/24   |
| BJPCPT0150 | High Pass filter                              | WHKS 1200-10SS                | Wainwright<br>instruments | 22/24   |
| BJPCTC0034 | Notch Filter                                  | WRCT800/880-0.2/40-<br>5SSK   | Wainwright<br>instruments | 22/24   |
| BJPCPT0151 | Notch Filter                                  | WRCD1800/2000-0.2/40-<br>5SSK | Wainwright<br>instruments | 22/24   |
| BJPCTC0017 | Radio Communication Tester                    | CMU200                        | Rohde&Schwarz             | 22/24   |