

## FCC Part 22/24 Compliance Test Report

|                                                         |                                                                                                                                                                                                                                                                                                                      |                                   |                                                                                                                                                   |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Report no.:</b>                                 | FCC22&24_RM-875_02                                                                                                                                                                                                                                                                                                   | <b>Date of Report:</b>            | 22-May-2013                                                                                                                                       |
| <b>Number of pages:</b>                                 | 21                                                                                                                                                                                                                                                                                                                   | <b>Customer's Contact person:</b> | Tero Huhtala                                                                                                                                      |
| <b>Testing laboratory:</b>                              | TCC Nokia Tampere Laboratory<br>P.O. Box 68<br>Sinitaival 5<br>FIN-33720 TAMPERE, FINLAND<br>Tel. +358 (0) 7180 46800<br>Fax. +358 (0) 7180 46880                                                                                                                                                                    | <b>Customer:</b>                  | Nokia Corporation<br>P.O.Box(86)<br>Joensuunkatu 7H / Kiila 1B<br>FIN-24101 SALO, FINLAND<br>Tel. +358 (0) 7180 08000<br>Fax. +358 (0) 7180 45220 |
| <b>FCC listing no.:</b>                                 | 94436                                                                                                                                                                                                                                                                                                                |                                   |                                                                                                                                                   |
| <b>IC recognition no.:</b>                              | 661AK-1                                                                                                                                                                                                                                                                                                              |                                   |                                                                                                                                                   |
| <b>Tested devices/ accessories:</b>                     | <b>Phone RM-875 / AC charger AC-60E / Charging data cable CA-190CD / Headset WH-208 / Battery BV-5XW</b>                                                                                                                                                                                                             |                                   |                                                                                                                                                   |
| <b>FCC ID:</b>                                          | PDNA                                                                                                                                                                                                                                                                                                                 | <b>IC:</b>                        | -                                                                                                                                                 |
| <b>Supplement reports:</b>                              | -                                                                                                                                                                                                                                                                                                                    |                                   |                                                                                                                                                   |
| <b>Testing has been carried out in accordance with:</b> | CFR 47, FCC rules Parts 22/24 , TIA-603-C-2004 and IC standards, RSS-GEN (Issue 3, December 2010), RSS-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009). 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>             |                                                                                                                                                                                                                                                                                                                      |                                   |                                                                                                                                                   |
|                                                         | <b>Jari Jantunen, System Manager, EMC</b>                                                                                                                                                                                                                                                                            |                                   |                                                                                                                                                   |

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

|                               |                                                     |
|-------------------------------|-----------------------------------------------------|
| Date of receipt               | 16-Apr-2013                                         |
| Testing completed             | 02-May-2013                                         |
| The customer's contact person | Tero Huhtala                                        |
| Test Plan referred to         | T:\Projects\RM-875\TestPlan\RS_testplan_RM-875.xlsm |
| Notes                         | -                                                   |
| Document name                 | T:\Projects\RM-875\EMC\FCC22&24_RM-875_02.docx      |

### 1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:

GSM/WCDMA/LTE/WLAN/Bluetooth

The EUT is tested with maximum rated TX power.

Devices under tests

| Product             | Type     | SN                          | HW                       | MV | SW                   | DUT   |
|---------------------|----------|-----------------------------|--------------------------|----|----------------------|-------|
| Phone               | RM-875   | 004402473696239             | 1700                     | -  | 3035.0000.1315.0000  | 43001 |
| AC charger          | AC-60E   | 4090493047580200140;0675677 | B1.0 HW0.3<br>MW0.2 PV02 | -  | -                    | 42974 |
| Charging data cable | CA-190CD | 07304562465628              | -                        | -  | -                    | 42976 |
| Headset             | WH-208   | 1411621                     | -                        | -  | -                    | 42831 |
| Battery             | BV-5XW   | -                           | LG 2.3                   | -  | -                    | 42971 |
| Phone               | RM-875   | 004402473691073             | 1700                     | -  | 3033.0000.1313.10064 | 43008 |

### 1.2. Summary of Test Results

#### GSM850:

| Section in CFR 47     | Section in RSS-GEN or RSS-132 | Name of the test                           | Result |
|-----------------------|-------------------------------|--------------------------------------------|--------|
| §2.1046(a), 22.913(a) | 4.4                           | Conducted RF output power                  | -      |
| §22.913(a)            | 4.4                           | Radiated RF output power                   | PASSED |
| §2.1049(h)            | 4.6.1                         | 99 % occupied bandwidth                    | -      |
| §22.917(a)            | 4.5                           | Band edge compliance                       | PASSED |
| §22.917(a), §2.1051   | 4.5                           | Spurious emissions at antenna terminals    | -      |
| §22.917(a), §2.1053   | 4.5                           | Spurious radiated emissions                | PASSED |
| §2.1055(a)            | 4.3                           | Frequency stability, temperature variation | -      |
| §2.1055(d)            | 4.3                           | Frequency stability, voltage variation     | -      |

#### WCDMA 850 (Band V):

| Section in CFR 47     | Section in RSS-GEN or RSS-132 | Name of the test                           | Result |
|-----------------------|-------------------------------|--------------------------------------------|--------|
| §2.1046(a), 22.913(a) | 4.4                           | Conducted RF output power                  | -      |
| §22.913(a)            | 4.4                           | Radiated RF output power                   | PASSED |
| §2.1049(h)            | 4.6.1                         | 99 % occupied bandwidth                    | -      |
| §22.917(a)            | 4.5                           | Band edge compliance                       | PASSED |
| §22.917(a), §2.1051   | 4.5                           | Spurious emissions at antenna terminals    | -      |
| §22.917(a), §2.1053   | 4.5                           | Spurious radiated emissions                | PASSED |
| §2.1055(a)            | 4.3                           | Frequency stability, temperature variation | -      |
| §2.1055(d)            | 4.3                           | Frequency stability, voltage variation     | -      |

**GSM1900:**

| Section in CFR 47   | Section in RSS-GEN or RSS-133 | Name of the test                           | Result |
|---------------------|-------------------------------|--------------------------------------------|--------|
| §2.1046(a)          | 6.4                           | Conducted RF output power                  | -      |
| §24.232(b)          | 6.4                           | Radiated RF output power                   | PASSED |
| §2.1049(h)          | 4.6.1                         | 99 % occupied bandwidth                    | -      |
| §24.238(a)          | 6.5                           | Band edge compliance                       | PASSED |
| §24.238(a), §2.1051 | 6.5                           | Spurious emissions at antenna terminals    | -      |
| §24.238(a), §2.1053 | 6.5                           | Spurious radiated emissions                | PASSED |
| §2.1055(a)          | 6.3                           | Frequency stability, temperature variation | -      |
| §2.1055(d)          | 6.3                           | Frequency stability, voltage variation     | -      |

**WCDMA 1900 (Band II):**

| Section in CFR 47   | Section in RSS-GEN or RSS-133 | Name of the test                           | Result |
|---------------------|-------------------------------|--------------------------------------------|--------|
| §2.1046(a)          | 6.4                           | Conducted RF output power                  | -      |
| §24.232(b)          | 6.4                           | Radiated RF output power                   | PASSED |
| §2.1049(h)          | 4.6.1                         | 99 % occupied bandwidth                    | -      |
| §24.238(a)          | 6.5                           | Band edge compliance                       | PASSED |
| §24.238(a), §2.1051 | 6.5                           | Spurious emissions at antenna terminals    | -      |
| §24.238(a), §2.1053 | 6.5                           | Spurious radiated emissions                | PASSED |
| §2.1055(a)          | 6.3                           | Frequency stability, temperature variation | -      |
| §2.1055(d)          | 6.3                           | Frequency stability, voltage variation     | -      |

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 Laboratory.

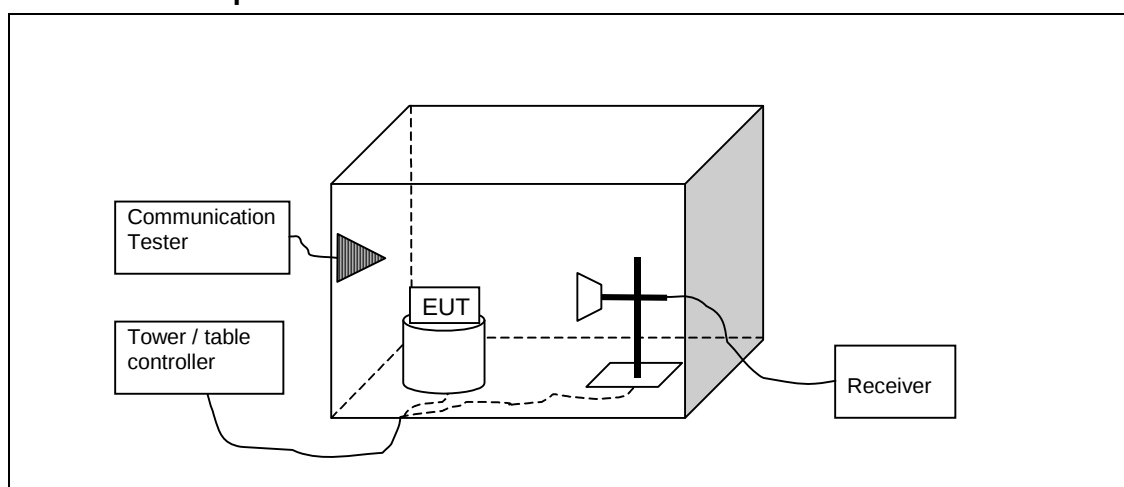
## CONTENTS

|                                                                                                                                                                     |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>1. Summary for FCC Part 22/24 Compliance Test Report .....</b>                                                                                                   | <b>2</b>  |
| 1.1. EUT and Accessory Information .....                                                                                                                            | 2         |
| 1.2. Summary of Test Results .....                                                                                                                                  | 2         |
| <b>2. Radiated RF output power<br/>(FCC §22.913(a), §24.232(b), RSS-132 4.4, RSS-133 6.4) .....</b>                                                                 | <b>5</b>  |
| 2.2. Test method and limit .....                                                                                                                                    | 5         |
| 1.1 GSM850 TX Test results .....                                                                                                                                    | 6         |
| 1.2 GSM1900 TX Test results .....                                                                                                                                   | 6         |
| 1.3 WCDMA 1900 (Band II) TX Test results .....                                                                                                                      | 6         |
| 1.4 WCDMA 850 (Band V) TX Test results .....                                                                                                                        | 7         |
| <b>3. Band edge compliance<br/>(FCC §22.917(a), §24.238(a), §27.53(g), §27.53(h), §27.53(c)(2)(4), §27.53(g), RSS-<br/>132 4.5, RSS-133 6.5, RSS-139 6.5) .....</b> | <b>8</b>  |
| 3.1. Test Setup .....                                                                                                                                               | 8         |
| 3.2. Test method and limit .....                                                                                                                                    | 8         |
| 3.3. GSM 1900 Test results .....                                                                                                                                    | 9         |
| 3.4. GSM 850 Test results .....                                                                                                                                     | 11        |
| 3.5. WCDMA 1900 Test results .....                                                                                                                                  | 13        |
| 3.6. WCDMA 850 Test results .....                                                                                                                                   | 14        |
| <b>4. Spurious radiated emissions<br/>(FCC §22.917(a), §2.1053, §24.238(a), §2.1053, RSS-132 4.5, RSS-133 6.5) .....</b>                                            | <b>16</b> |
| 4.2. Test method and limit .....                                                                                                                                    | 16        |
| 4.3. GSM850 TX test results .....                                                                                                                                   | 18        |
| 4.4. GSM850-E1 TX Test results .....                                                                                                                                | 18        |
| 4.5. GSM1900 TX test results .....                                                                                                                                  | 18        |
| 4.6. GSM1900-E1 TX Test results .....                                                                                                                               | 19        |
| 4.7. WCDMA 1900 (Band II) test results .....                                                                                                                        | 19        |
| 4.8. WCDMA 850 (Band V) test results .....                                                                                                                          | 19        |
| <b>5. Test Equipment .....</b>                                                                                                                                      | <b>20</b> |
| 5.1. Conducted measurements .....                                                                                                                                   | 20        |
| 5.2. Radiated measurements .....                                                                                                                                    | 20        |

## 2. Radiated RF output power (FCC §22.913(a), §24.232(b), RSS-132 4.4, RSS-133 6.4)

|                                                 |                           |
|-------------------------------------------------|---------------------------|
| EUT with DUT number                             | RM-875, DUT 43001         |
| Accessories with DUT numbers                    | -                         |
| Operation Voltage [V] / [Hz]                    | Nominal                   |
| Results                                         | PASSED                    |
| Remarks                                         | -                         |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 22-24 / 42-49 / 98.2-99.8 |
| Date of measurements                            | 30-Apr.. 02-May-2013      |
| Measured by                                     | Jari Jantunen             |

### 2.1.1 Test setup



### 2.2. Test method and limit

The measurement is made according to TIA-603-C-2004 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. The measurement results are obtained as described below:

$$P[dBm] = P_{SUBST\ TX} + P_{MEAS} - P_{SUBST\ RX} - L_{SUBST\ CABLES} + G_{SUBST\ TX\ ANT}$$

Where  $P_{SUBST\ TX}$  is signal generator level.  $P_{MEAS}$  is measured power level from the EUT.  $P_{SUBST\ RX}$  is measured power level in substitute measurement.  $L_{SUBST\ CABLE}$  is the loss of the cable between the signal generator and the substitution antenna and  $G_{SUBST\ TX\ ANT}$  is substitution antenna gain.

Limits for radiated RF output power measurements

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

## 1.1 GSM850 TX Test results

GSM mode

| Channel / f <sub>c</sub> [MHz] | ERP [dBm] | ERP [W] | P <sub>MEAS</sub> [dBm] | P <sub>SUBST TX</sub> [dBm] | P <sub>SUBST RX</sub> [dBm] | G <sub>SUBST TX ANT</sub> [dBd] | L <sub>SUBST CABLE</sub> [dB] | Polarisation | Result |
|--------------------------------|-----------|---------|-------------------------|-----------------------------|-----------------------------|---------------------------------|-------------------------------|--------------|--------|
| 128 / 824.2                    | 28.03     | 0.635   | -4.91                   | 10                          | -29.76                      | -3.42                           | 3.4                           | HORIZONTAL   | PASSED |
| 190 / 836.6                    | 27.61     | 0.577   | -4.63                   | 10                          | -29.41                      | -3.77                           | 3.4                           | HORIZONTAL   | PASSED |
| 251 / 848.8                    | 27.37     | 0.546   | -4.98                   | 10                          | -29.24                      | -3.49                           | 3.4                           | VERTICAL     | PASSED |

EGPRS mode, 1 TX Slot

| Channel / f <sub>c</sub> [MHz] | ERP [dBm] | ERP [W] | P <sub>MEAS</sub> [dBm] | P <sub>SUBST TX</sub> [dBm] | P <sub>SUBST RX</sub> [dBm] | G <sub>SUBST TX ANT</sub> [dBd] | L <sub>SUBST CABLE</sub> [dB] | Polarisation | Result |
|--------------------------------|-----------|---------|-------------------------|-----------------------------|-----------------------------|---------------------------------|-------------------------------|--------------|--------|
| 128 / 824.2                    | 25.29     | 0.338   | -7.65                   | 10                          | -29.76                      | -3.42                           | 3.4                           | HORIZONTAL   | PASSED |
| 190 / 836.6                    | 25.04     | 0.319   | -7.2                    | 10                          | -29.41                      | -3.77                           | 3.4                           | HORIZONTAL   | PASSED |
| 251 / 848.8                    | 23.82     | 0.241   | -8.53                   | 10                          | -29.24                      | -3.49                           | 3.4                           | VERTICAL     | PASSED |

## 1.2 GSM1900 TX Test results

GSM mode

| Channel / f <sub>c</sub> [MHz] | EIRP [dBm] | EIRP [W] | P <sub>MEAS</sub> [dBm] | P <sub>SUBST TX</sub> [dBm] | P <sub>SUBST RX</sub> [dBm] | G <sub>SUBST TX ANT</sub> [dBi] | L <sub>SUBST CABLE</sub> [dB] | Polarisation | Result |
|--------------------------------|------------|----------|-------------------------|-----------------------------|-----------------------------|---------------------------------|-------------------------------|--------------|--------|
| 512 / 1850.2                   | 30.53      | 1.130    | -13.8                   | +10                         | -29.2                       | 9.98                            | 5                             | HORIZONTAL   | PASSED |
| 661 / 1880                     | 30.55      | 1.135    | -13.58                  | +10                         | -28.95                      | 10.07                           | 5.1                           | HORIZONTAL   | PASSED |
| 810 / 1909.8                   | 30.16      | 1.038    | -13.93                  | +10                         | -29.05                      | 10.27                           | 5.1                           | HORIZONTAL   | PASSED |

EGPRS mode, 1 TX Slot

| Channel / f <sub>c</sub> [MHz] | EIRP [dBm] | EIRP [W] | P <sub>MEAS</sub> [dBm] | P <sub>SUBST TX</sub> [dBm] | P <sub>SUBST RX</sub> [dBm] | G <sub>SUBST TX ANT</sub> [dBi] | L <sub>SUBST CABLE</sub> [dB] | Polarisation | Result |
|--------------------------------|------------|----------|-------------------------|-----------------------------|-----------------------------|---------------------------------|-------------------------------|--------------|--------|
| 512 / 1850.2                   | 26.99      | 0.500    | -17.34                  | +10                         | -29.2                       | 9.98                            | 5                             | HORIZONTAL   | PASSED |
| 661 / 1880                     | 26.28      | 0.425    | -17.85                  | +10                         | -28.95                      | 10.07                           | 5.1                           | HORIZONTAL   | PASSED |
| 810 / 1909.8                   | 26.23      | 0.420    | -17.86                  | +10                         | -29.05                      | 10.27                           | 5.1                           | HORIZONTAL   | PASSED |

## 1.3 WCDMA 1900 (Band II) TX Test results

Peak Detector

| Channel / f <sub>c</sub> [MHz] | EIRP [dBm] | EIRP [W] | P <sub>MEAS</sub> [dBm] | P <sub>SUBST TX</sub> [dBm] | P <sub>SUBST RX</sub> [dBm] | G <sub>SUBST TX ANT</sub> [dBi] | L <sub>SUBST CABLE</sub> [dB] | Polarisation | Result |
|--------------------------------|------------|----------|-------------------------|-----------------------------|-----------------------------|---------------------------------|-------------------------------|--------------|--------|
| 512 / 1850.2                   | 26.76      | 0.474    | -17.57                  | 10                          | -29.2                       | 10.13                           | 5                             | HORIZONTAL   | PASSED |
| 661 / 1880                     | 26.98      | 0.499    | -17.15                  | 10                          | -28.95                      | 10.28                           | 5.1                           | HORIZONTAL   | PASSED |
| 810 / 1909.8                   | 26.59      | 0.456    | -17.5                   | 10                          | -29.05                      | 10.14                           | 5.1                           | HORIZONTAL   | PASSED |

RMS Detector

| Channel / f <sub>c</sub> [MHz] | EIRP [dBm] | EIRP [W] | P <sub>MEAS</sub> [dBm] | P <sub>SUBST TX</sub> [dBm] | P <sub>SUBST RX</sub> [dBm] | G <sub>SUBST TX ANT</sub> [dBi] | L <sub>SUBST CABLE</sub> [dB] | Polarisation | Result |
|--------------------------------|------------|----------|-------------------------|-----------------------------|-----------------------------|---------------------------------|-------------------------------|--------------|--------|
| 512 / 1850.2                   | 23.11      | 0.205    | -21.22                  | 10                          | -29.2                       | 10.13                           | 5                             | HORIZONTAL   | PASSED |
| 661 / 1880                     | 23.24      | 0.211    | -20.89                  | 10                          | -28.95                      | 10.28                           | 5.1                           | HORIZONTAL   | PASSED |
| 810 / 1909.8                   | 23.05      | 0.202    | -21.04                  | 10                          | -29.05                      | 10.14                           | 5.1                           | HORIZONTAL   | PASSED |

## 1.4 WCDMA 850 (Band V) TX Test results

### PeakDetector

| Channel / $f_c$<br>[MHz] | ERP<br>[dBm] | ERP<br>[W] | $P_{MEAS}$<br>[dBm] | $P_{SUBST\ TX}$<br>[dBm] | $P_{SUBST\ RX}$<br>[dBm] | $G_{SUBST\ TX\ ANT}$<br>[dBd] | $L_{SUBST\ CABLE}$<br>[dB] | Polarisation | Result |
|--------------------------|--------------|------------|---------------------|--------------------------|--------------------------|-------------------------------|----------------------------|--------------|--------|
| 4132 / 826.4             | 21.86        | 0.153      | -11.08              | 10                       | -29.76                   | -3.42                         | 3.4                        | VERTICAL     | PASSED |
| 4183 / 836.6             | 21.6         | 0.145      | -10.64              | 10                       | -29.41                   | -3.77                         | 3.4                        | VERTICAL     | PASSED |
| 4233 / 846.6             | 22.24        | 0.167      | -10.11              | 10                       | -29.24                   | -3.49                         | 3.4                        | VERTICAL     | PASSED |

### RMS Detector

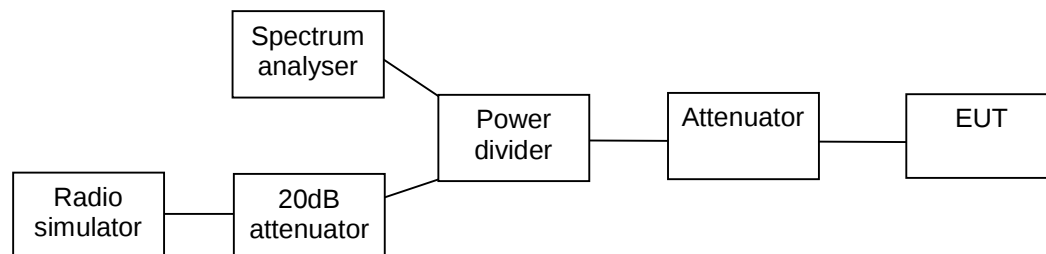
| Channel / $f_c$<br>[MHz] | ERP<br>[dBm] | ERP<br>[W] | $P_{MEAS}$<br>[dBm] | $P_{SUBST\ TX}$<br>[dBm] | $P_{SUBST\ RX}$<br>[dBm] | $G_{SUBST\ TX\ ANT}$<br>[dBd] | $L_{SUBST\ CABLE}$<br>[dB] | Polarisation | Result |
|--------------------------|--------------|------------|---------------------|--------------------------|--------------------------|-------------------------------|----------------------------|--------------|--------|
| 4132 / 826.4             | 18.19        | 0.066      | -14.75              | 10                       | -29.76                   | -3.42                         | 3.4                        | VERTICAL     | PASSED |
| 4183 / 836.6             | 18.19        | 0.066      | -14.05              | 10                       | -29.41                   | -3.77                         | 3.4                        | VERTICAL     | PASSED |
| 4233 / 846.6             | 18.26        | 0.067      | -14.09              | 10                       | -29.24                   | -3.49                         | 3.4                        | VERTICAL     | PASSED |

### 3. Band edge compliance

(FCC §22.917(a), §24.238(a), §27.53(g), §27.53(h), §27.53(c)(2)(4), §27.53(g), RSS-132 4.5, RSS-133 6.5, RSS-139 6.5)

|                                                 |                   |
|-------------------------------------------------|-------------------|
| EUT with DUT number                             | RM-875, DUT 43008 |
| Accessories with DUT numbers                    | Dummy Battery     |
| Operation Voltage [V] / [Hz]                    | Nominal           |
| Results                                         | PASSED            |
| Remarks                                         | -                 |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 21 / 43 / 99.9    |
| Date of measurements                            | 19-Apr-2013       |
| Measured by                                     | Timo Raiskio      |

#### 3.1. Test Setup



#### 3.2. Test method and limit

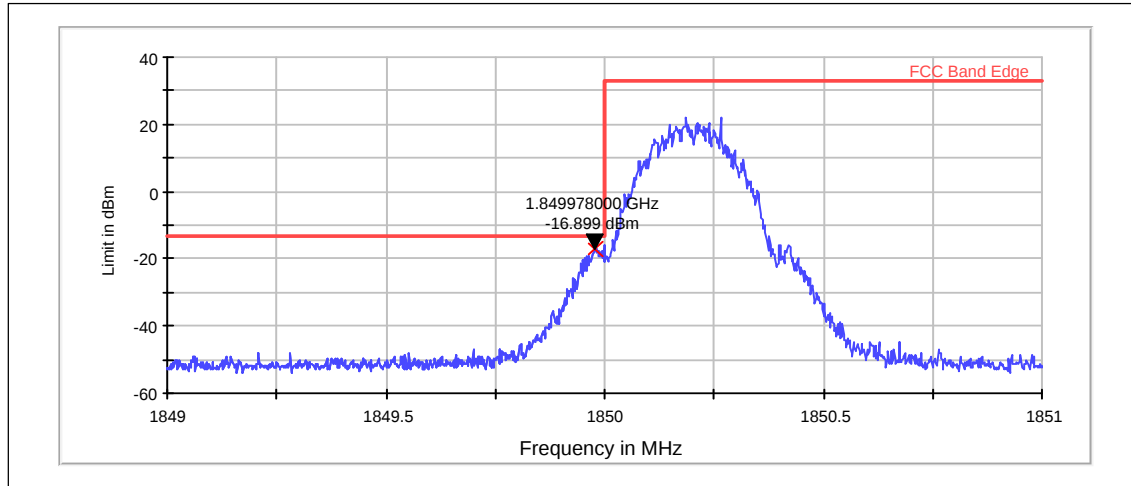
The measurement is made according to FCC rules parts 22, 24, 27 and IC standards , RSS-132, RSS-133, RSS-139.

Limits for band edge compliance measurements

| Operation band                | Frequency range [MHz]                                      | Limit [dBm]                                        |
|-------------------------------|------------------------------------------------------------|----------------------------------------------------|
| LTE 700 Lower                 | 703.9 – 704 and 716 – 716.1<br>Below 703.9 and above 716.1 | -13 (RBW = 30 kHz, ERP)<br>-13 (RBW = 30 kHz, ERP) |
| GSM850 / WCDMA850 / LTE850    | Below 824 and above 849                                    | -13                                                |
| WCDMA1700 / LTE1700           | Below 1710 and above 1755                                  | -13                                                |
| GSM1900 / LTE1900 / WCDMA1900 | Below 1850 and above 1910                                  | -13                                                |

### 3.3. GSM 1900 Test results

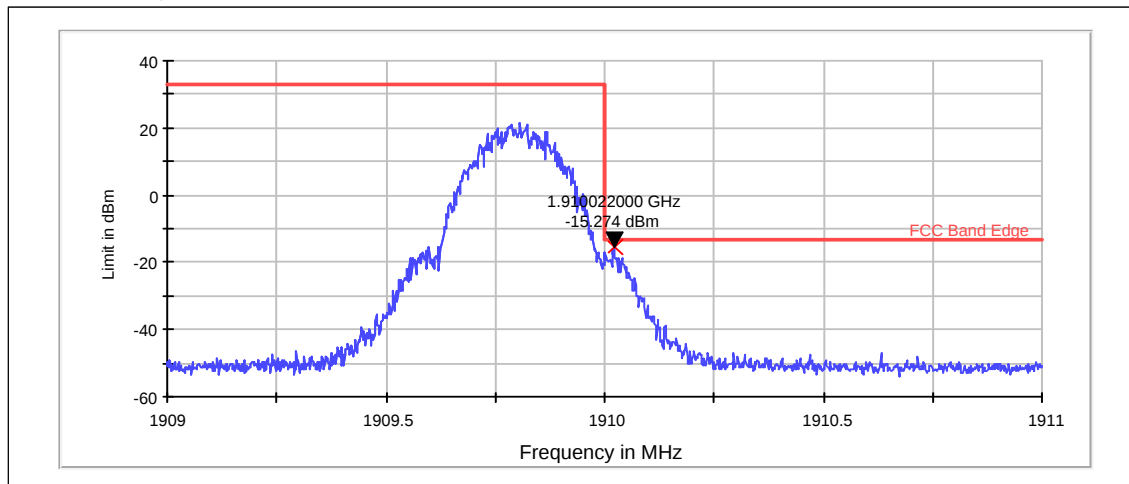
Channel 512 / 1850.2 MHz



Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GSM                    | 1849.978        | -16.90      | PASSED |

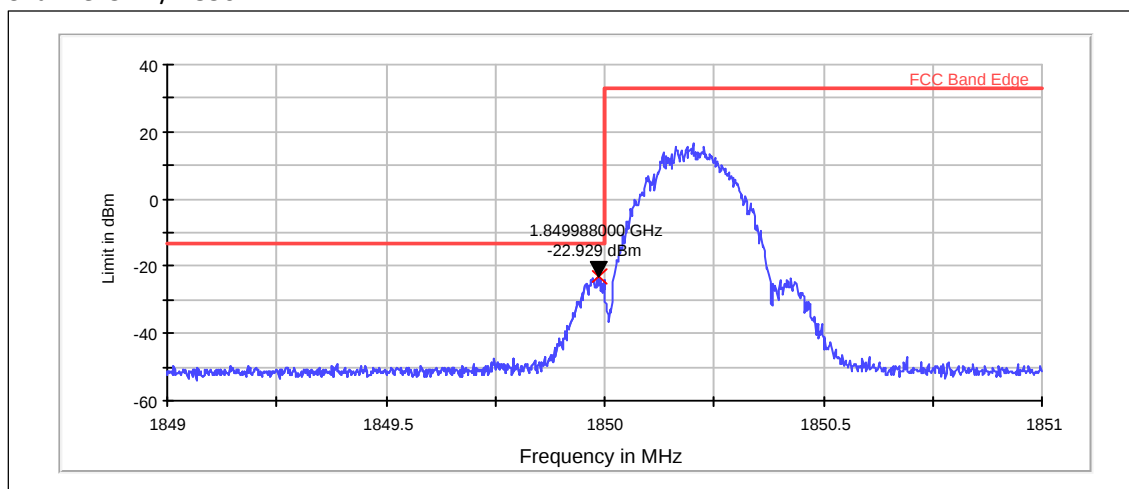
### Channel 810 / 1909.8 MHz



Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GSM                    | 1910.022        | -15.27      | PASSED |

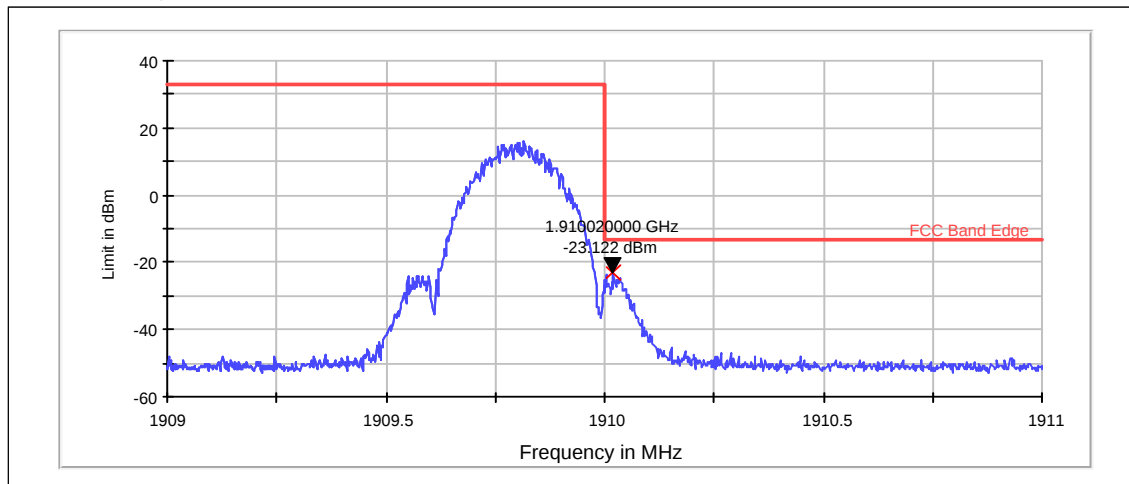
### Channel 512 / 1850.2 MHz



Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| EGPRS                  | 1849.988        | -22.93      | PASSED |

#### Channel 810 / 1909.8 MHz

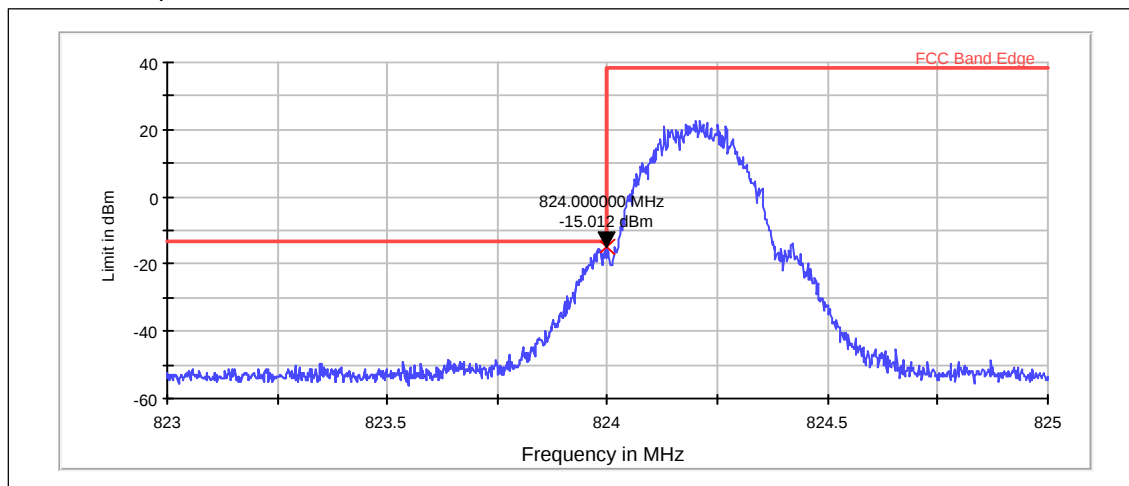


Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| EGPRS                  | 1910.020        | -23.12      | PASSED |

### 3.4. GSM 850 Test results

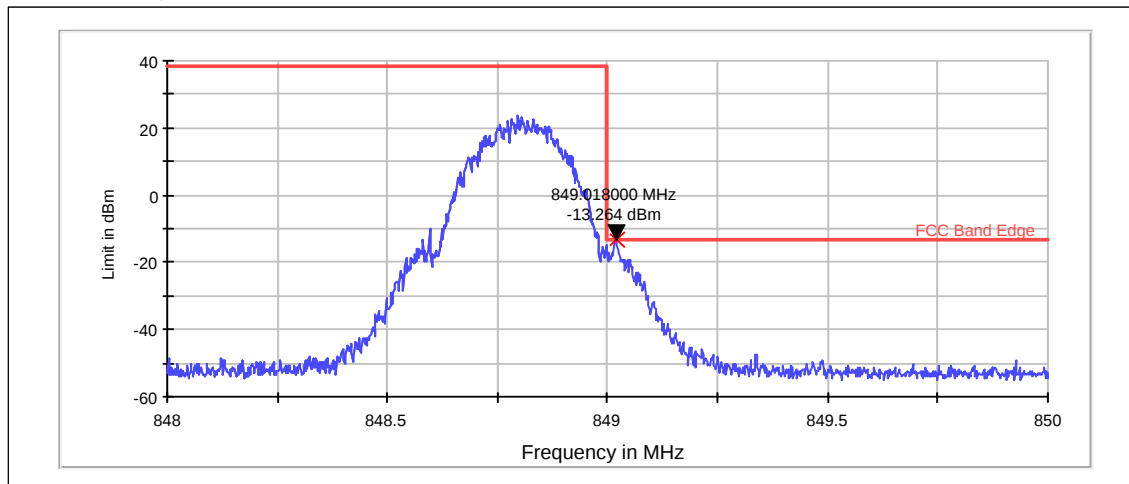
#### Channel 128 / 824.2 MHz



Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GSM                    | 824.000         | -15.01      | PASSED |

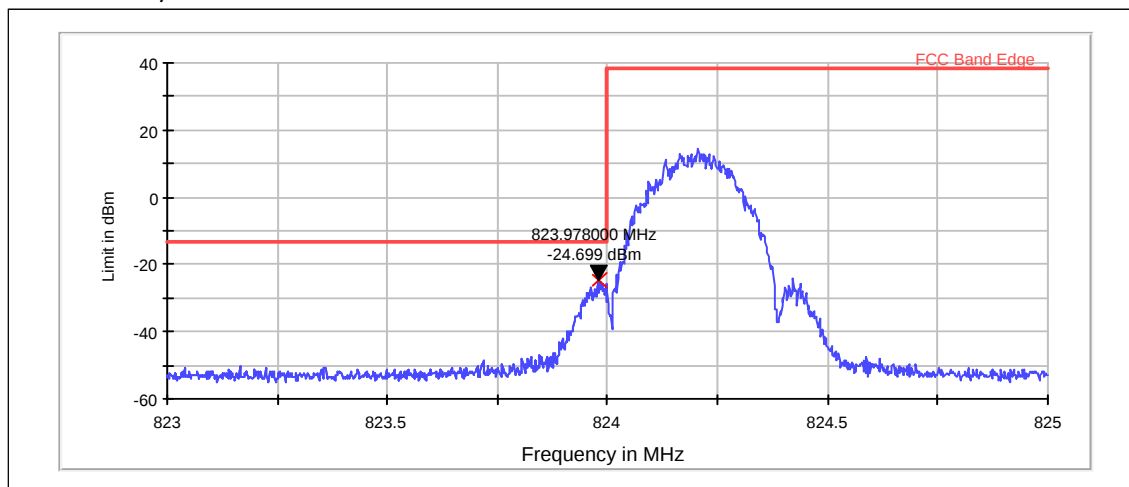
## Channel 251 / 848.8 MHz



Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| GSM                    | 849.018         | -13.26      | PASSED |

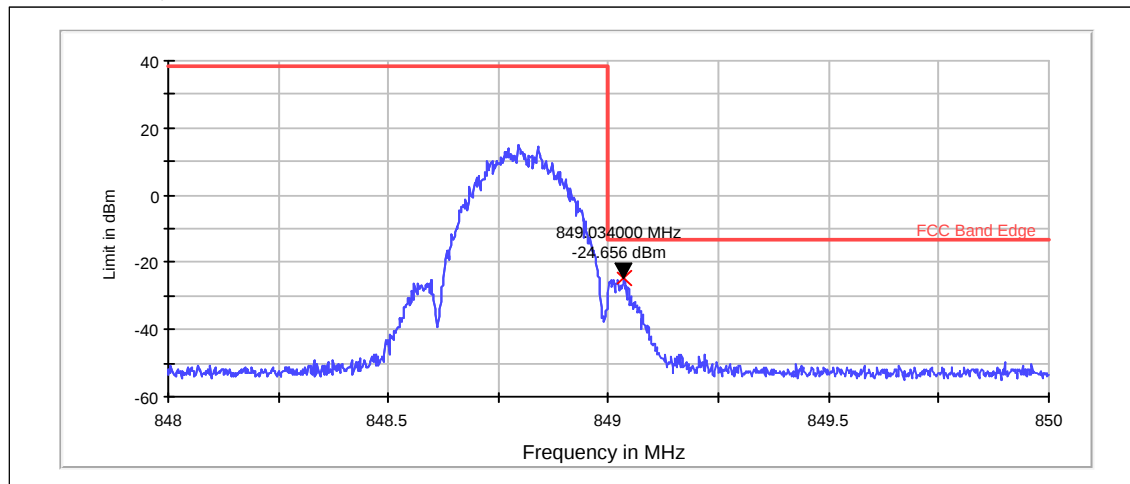
## Channel 128 / 824.2 MHz



Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| EGPRS                  | 823.978         | -24.70      | PASSED |

### Channel 251 / 848.8 MHz

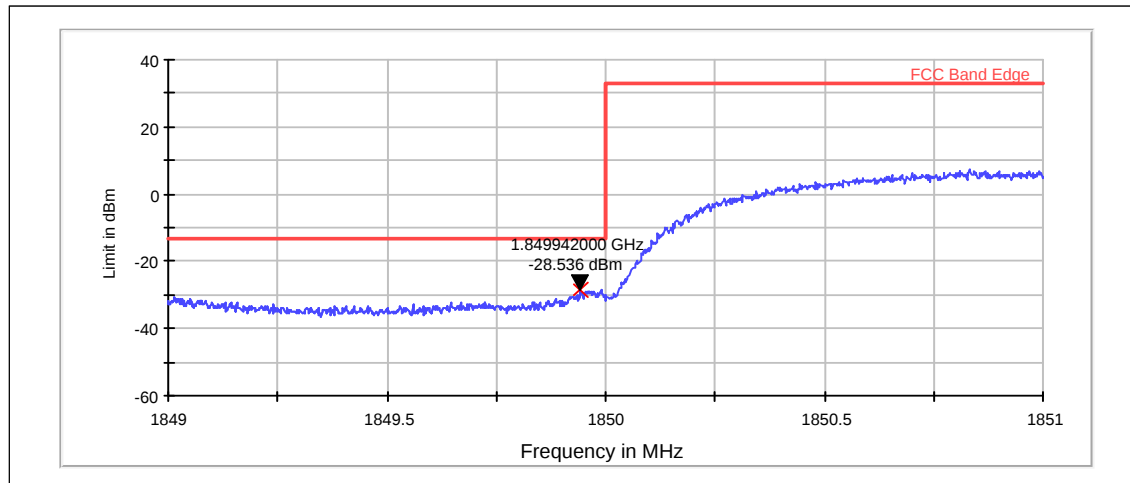


Peak (RBW: 3 kHz, VBW: 3 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| EGPRS                  | 849.034         | -24.66      | PASSED |

### 3.5. WCDMA 1900 Test results

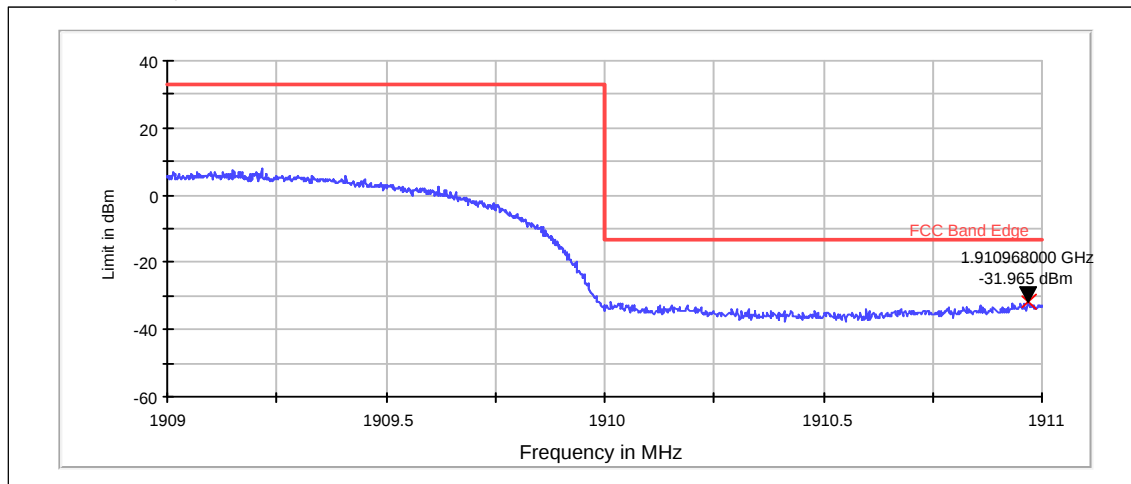
#### Channel 9262 / 1852.4 MHz



RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| FDD                    | 1849.942        | -28.54      | PASSED |

### Channel 9538 / 1907.6 MHz

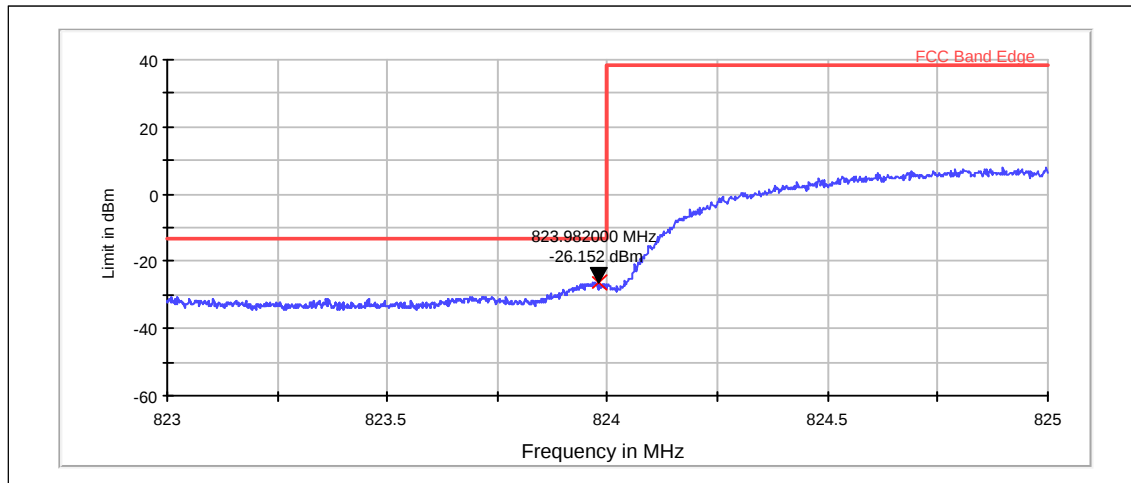


RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| FDD                    | 1910.968        | -31.97      | PASSED |

### 3.6. WCDMA 850 Test results

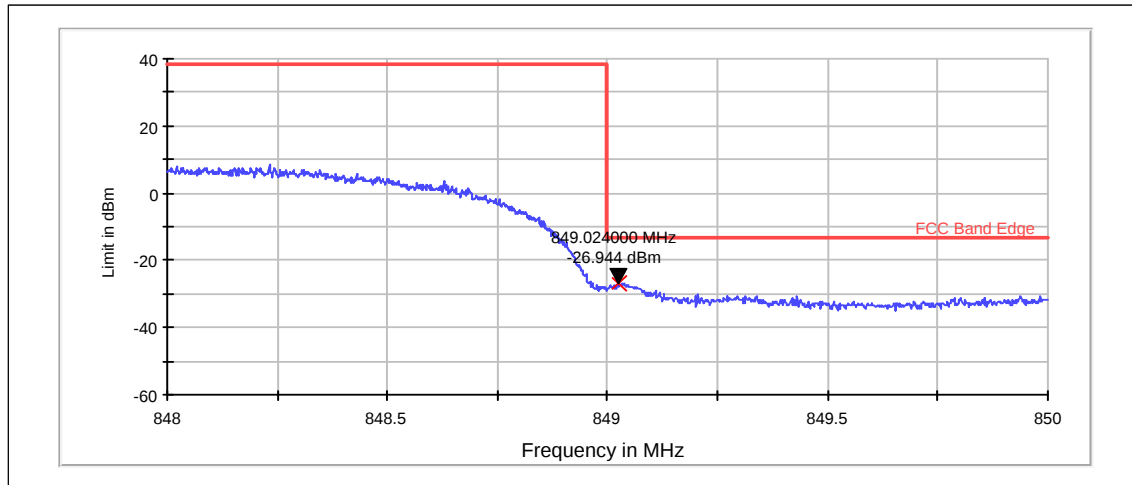
#### Channel 4132 / 826.4 MHz



RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| FDD                    | 823.982         | -26.15      | PASSED |

Channel 4233 / 846.6 MHz



RMS (RBW: 50 kHz, VBW: 50 kHz, Max hold)

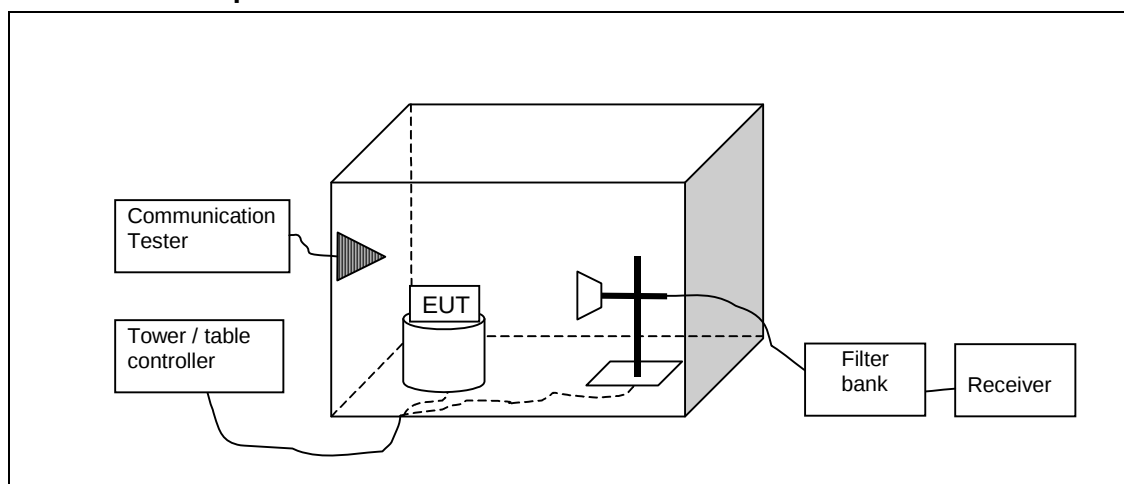
| Operation mode (TX on) | Frequency [MHz] | Level [dBm] | Result |
|------------------------|-----------------|-------------|--------|
| FDD                    | 849.024         | -26.94      | PASSED |

## 4. Spurious radiated emissions

(FCC §22.917(a), §2.1053, §24.238(a), §2.1053, RSS-132 4.5, RSS-133 6.5)

|                                                 |                                                                                 |
|-------------------------------------------------|---------------------------------------------------------------------------------|
| EUT with DUT number                             | RM-875, DUT 43001                                                               |
| Accessories with DUT numbers                    | AC-60E, DUT 42974 ; CA-190CD, DUT 42976 ; WH-208, DUT 42831 ; BV-5XW, DUT 42971 |
| Operation Voltage [V] / [Hz]                    | 115 / 60                                                                        |
| Results                                         | PASSED                                                                          |
| Remarks                                         | -                                                                               |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 23 / 45 / 98.5                                                                  |
| Date of measurements                            | 17-Apr-2013                                                                     |
| Measured by                                     | Jari Jantunen                                                                   |

### 4.1.1 Test setup



### 4.2. Test method and limit

The measurement is made according to TIA-603-C-2004 as follows:

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations.

The emissions less than 20 dB below the permissible value are reported.

The substitution method is used.

The measurement results are obtained as described below:

$$P [dBm] = P_{SUBST\ TX} + G_{SUBST\ TX\ ANT} - L_{SUBST\ CABLE}$$

Where  $P_{SUBST\ TX}$  is signal generator level, which produces the same receiver reading  $P_{MEAS}$  in dBm as EUT.  $G_{SUBST\ TX\ ANT}$  is substitution antenna gain and  $L_{SUBST\ CABLE}$  is the loss of the cable between the signal generator and the substitution antenna.

Limits for spurious radiated emissions measurements

| Operation band      | Frequency range [MHz] | Limit [dBm] |
|---------------------|-----------------------|-------------|
| GSM850 / WCDMA850   | 30 - 8500             | -13         |
| GSM1900 / WCDMA1900 | 30 - 18000            | -13         |

### 4.3. GSM850 TX test results

Peak detector

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarization | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 1673.307        | -42.54  | 0.05571      | -36.4                   | -6.14                 | HORIZONTAL   | PASSED  |
| 1673.427        | -54.55  | 0.00351      | -48.44                  | -6.11                 | VERTICAL     | PASSED  |
| 2503.126        | -53.78  | 0.00419      | -55.54                  | 1.76                  | VERTICAL     | PASSED  |
| 2509.86         | -52     | 0.00631      | -53.76                  | 1.76                  | HORIZONTAL   | PASSED  |
| 3385.331        | -57.95  | 0.0016       | -62.54                  | 4.59                  | VERTICAL     | PASSED  |

\*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

### 4.4. GSM850-E1 TX Test results

EGPRS mode, Channel 190 / 836.6 MHz

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|--------|
| 1673.246        | -50.37  | 0.00918      | -44.23                  | -6.14                 | HORIZONTAL   | PASSED |
| 1676.693        | -59.61  | 0.00109      | -53.44                  | -6.17                 | VERTICAL     | PASSED |
| 2508.236        | -53.65  | 0.00432      | -55.37                  | 1.72                  | HORIZONTAL   | PASSED |
| 2520.381        | -53.88  | 0.00409      | -55.61                  | 1.73                  | VERTICAL     | PASSED |
| 3345.752        | -57.9   | 0.00162      | -62.41                  | 4.51                  | VERTICAL     | PASSED |

\*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

### 4.5. GSM1900 TX test results

Peak detector

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarization | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 3759.96         | -47.53  | 0.01765      | -55.92                  | 8.39                  | VERTICAL     | PASSED  |
| 3783.006        | -54.62  | 0.00345      | -62.92                  | 8.3                   | VERTICAL     | PASSED  |
| 5639.88         | -40.2   | 0.0955       | -51.1                   | 10.9                  | HORIZONTAL   | PASSED  |
| 7576.874        | -49.72  | 0.01067      | -64.04                  | 14.32                 | VERTICAL     | PASSED  |
| 9638.397        | -46.25  | 0.0237       | -66.11                  | 19.86                 | VERTICAL     | PASSED  |

\*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

#### 4.6. GSM1900-E1 TX Test results

EGPRS mode, Channel 661 / 1880.0 MHz

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|--------|
| 3759.94         | -48.07  | 0.0156       | -56.46                  | 8.39                  | VERTICAL     | PASSED |
| 3760.06         | -52.55  | 0.00556      | -60.94                  | 8.39                  | VERTICAL     | PASSED |
| 5639.86         | -49.17  | 0.01211      | -60.06                  | 10.89                 | HORIZONTAL   | PASSED |
| 7527.234        | -49.58  | 0.01102      | -63.8                   | 14.22                 | VERTICAL     | PASSED |
| 9669.76         | -46.51  | 0.02234      | -66.64                  | 20.13                 | VERTICAL     | PASSED |

\*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

#### 4.7. WCDMA 1900 (Band II) test results

Channel 9400 / 1880.0 MHz

FDD mode, Peak detector

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarization | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 5642.064        | -49.06  | 0.01242      | -59.86                  | 10.8                  | HORIZONTAL   | PASSED  |
| 7528.397        | -49.72  | 0.01066      | -63.95                  | 14.23                 | VERTICAL     | PASSED  |
| 9384.389        | -45.02  | 0.03151      | -64.55                  | 19.53                 | VERTICAL     | PASSED  |
| 9711.443        | -45.86  | 0.02594      | -65.74                  | 19.88                 | HORIZONTAL   | PASSED  |
| 9882.184        | -45.27  | 0.02974      | -64.68                  | 19.41                 | VERTICAL     | PASSED  |
| 9987.293        | -45.71  | 0.02683      | -65.51                  | 19.8                  | VERTICAL     | PASSED  |

\*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

#### 4.8. WCDMA 850 (Band V) test results

Channel 4175 / 835.0 MHz

FDD mode, Peak detector

| Frequency [MHz] | P [dBm] | P [ $\mu$ W] | P <sub>MEAS</sub> [dBm] | A <sub>TOT</sub> [dB] | Polarization | Results |
|-----------------|---------|--------------|-------------------------|-----------------------|--------------|---------|
| 821.899         | -42.23  | 0.05991      | -75.3                   | 33.07                 | HORIZONTAL   | PASSED  |
| 848.586         | -46.02  | 0.02503      | -78.48                  | 32.46                 | HORIZONTAL   | PASSED  |
| 848.642         | -45.32  | 0.02941      | -78.04                  | 32.72                 | VERTICAL     | PASSED  |
| 1009.018        | -62.32  | 0.00059      | -52.86                  | -9.46                 | VERTICAL     | PASSED  |
| 2513.527        | -53.68  | 0.00429      | -55.41                  | 1.73                  | VERTICAL     | PASSED  |
| 2519.94         | -53.62  | 0.00434      | -55.33                  | 1.71                  | VERTICAL     | PASSED  |

\*Substitution method could not be utilized as no emissions above noise floor were found during measurements.

## 5. Test Equipment

### 5.1. Conducted measurements

| Eq. No  | Equipment                           | Type        | Manufacturer  | Used in                 |
|---------|-------------------------------------|-------------|---------------|-------------------------|
| TM38112 | Power supply                        | 6632A       | Agilent       | 22/24/27, 15C, 15E      |
| TM38631 | Signal Generator                    | 83640L      | Agilent       | 22/24/27, 15C, 15E, 15B |
| TM37678 | Communication Tester                | CMU200      | R&S           | 15C, 15B                |
| TM30600 | Impulse limiter                     | ESH3-Z2     | R&S           | 15C, 15B                |
| TM26490 | LISN 50 µH                          | ESH3-Z5     | R&S           | 15C, 15B                |
| TM26491 | LISN 50 µH                          | ESH3-Z5     | R&S           | 15C, 15B                |
| TM37610 | Spectrum Analyzer                   | FSU26       | R&S           | 22/24/27, 15C, 15E      |
| TM23007 | Oscilloscope                        | TDS684B     | Tektronix     | 15E                     |
| TM22806 | Battery                             | BAT 20/E    | Fiskars       | 15C, 15B                |
| TM22805 | UPS                                 | PS 20/1.2   | Fiskars       | 15C, 15B                |
| -       | Temperature and humidity logger     | 175-H2      | Testo         | 15C, 15B                |
| -       | Temperature and humidity logger     | 175-H2      | Testo         | 22/24/27, 15C           |
| -       | Air pressure and temperature logger | 635-2       | Testo         | 22/24/27, 15C, 15B      |
| -       | Air pressure sensor                 | 0638-1835   | Testo         | 22/24/27, 15C, 15B      |
| -       | Temperature test chamber            | VT 4002     | Vötsch        | 22/24/27                |
| 2058    | Receiver                            | ESPC        | R&S           | 15C, 15B                |
| 2001    | Bluetooth tester                    | CBT         | R&S           | 15C, 15B                |
| 2002    | Communication Tester                | CMU200      | R&S           | 22/24/27, 15C           |
| 2009    | LISN 50 µH                          | ENV216      | R&S           | 15C, 15B                |
| 2010    | LISN 50 µH                          | ENV216      | R&S           | 15C, 15B                |
| 2012    | Power splitter                      | 11667B      | Agilent       | 22/24/27, 15C           |
| 2013    | Attenuator                          | 8493C       | Agilent       | 22/24/27, 15C           |
| 2014    | Attenuator                          | 8493C       | Agilent       | 22/24/27, 15C           |
| 2019    | Power splitter                      | ZN2PD-9G-S+ | Mini-Circuits | 15E                     |
| 2020    | Power splitter                      | ZN2PD-9G-S+ | Mini-Circuits | 15E                     |
| 2021    | Communication Tester                | CMW500      | R&S           | 22/24/27                |
| 2023    | Spectrum Analyzer                   | ESMI-RF     | R&S           | 15B/15C                 |
| 2024    | Analyzer display unit               | ESAI-D      | R&S           | 15B/15C                 |

### 5.2. Radiated measurements

| Eq. No  | Equipment            | Type        | Manufacturer | Used in                 |
|---------|----------------------|-------------|--------------|-------------------------|
| TM38114 | Power supply         | 6632A       | Agilent      | 22/24/27, 15C, 15B      |
| TM38631 | Signal Generator     | 83640L      | Agilent      | 22/24/27, 15C, 15E, 15B |
| -       | Antenna              | BBHA 9120 D | Schwarzbeck  | 22/24/27, 15C           |
| TM26497 | Antenna              | 3115        | Emco         | 22/24/27, 15C, 15B      |
| TM37773 | Communication Tester | CMU200      | R&S          | 22/24/27, 15B           |
| TM38845 | Receiver             | ESIB 26     | R&S          | 22/24/27, 15C, 15E, 15B |
| -       | Antenna              | HL562       | R&S          | 22/24/27, 15C, 15E, 15B |
| -       | Turntable            | 2188        | EMCO         | 22/24/27, 15C, 15E, 15B |
| -       | Turntable controller | 2090        | EMCO         | 22/24/27, 15C, 15E, 15B |
| -       | RF system panel      | TS-RSP      | R&S          | 22/24/27, 15C, 15E, 15B |
| -       | RF system panel      | TS-RSP      | R&S          | 22/24/27, 15C, 15E, 15B |
| -       | Mini mast            | 2075-2      | ETS Lindgren | 22/24/27, 15C, 15B      |

| Eq. No  | Equipment                           | Type                                   | Manufacturer | Used in                 |
|---------|-------------------------------------|----------------------------------------|--------------|-------------------------|
| TM38843 | Mini mast                           | 2075                                   | Emco         | 22/24/27, 15C, 15B      |
| TM38842 | Antenna mast controller             | 2090                                   | Emco         | 22/24/27, 15C, 15B      |
| TM30643 | LISN 50 $\mu$ H                     | LISN-5-20-2                            | FCC          | 22/24/27, 15C, 15B      |
| TM30644 | LISN 50 $\mu$ H                     | LISN-5-20-2                            | FCC          | 22/24/27, 15C, 15B      |
| -       | Temperature and humidity logger     | 175-H2                                 | Testo        | 22/24/27, 15C, 15B      |
| -       | Air pressure and temperature logger | 635-2                                  | Testo        | 22/24/27, 15C, 15B      |
| -       | Air pressure sensor                 | 0638-1835                              | Testo        | 22/24/27, 15C, 15B      |
| TM37523 | Preamplifier                        | AMF-4D-10M-3G-25-20P                   | Miteq        | 22/24/27, 15C, 15B      |
| TM37498 | Preamplifier                        | AMF-5D-020180-26-10P                   | Miteq        | 22/24/27, 15C, 15B      |
| TM30599 | Semi anechoic chambre               | UNKNOWN                                | TDK          | 22/24/27, 15C, 15B      |
| TM22638 | Power supply                        | OL63743-901                            | -            | 22/24/27, 15C, 15E, 15B |
| TM38066 | High pass filter                    | WHKX3.0/18G-12SS                       | Wainwright   | 22/24/27, 15C, 15E, 15B |
| 2028    | High pass filter                    | WHKX 1.0/15G-12SS                      | Wainwright   | 22/24/27, 15C, 15E, 15B |
| TM37545 | Tunable notch filter                | 800.0/960.0-0.2/40-8SSK                | Wainwright   | 22                      |
| TM26512 | Tunable notch filter                | WRCD1850/1910-0.2/40-10SSK             | Wainwright   | 24                      |
| -       | Band reject filter                  | WRCG1877/1883-1870/1890-40/6EE         | Wainwright   | 24                      |
| -       | Band reject filter                  | WRCG1729.4/1735.4-1722.4/1742.4-40/6SS | Wainwright   | 27                      |
| -       | Band reject filter                  | WRCG832/838-825/848-40/5SS             | Wainwright   | 22                      |
| TM23892 | Controller                          | G-1000SDX                              | Yaesu        | 22/24/27                |
| 2001    | Bluetooth tester                    | CBT                                    | R&S          | 15C, 15B                |
| 6023    | Antenna                             | VUBA 9117                              | Schwarzbeck  | 22/24/27                |
| 2021    | Communication Tester                | CMW500                                 | R&S          | 22/24/27                |
| 2025    | Antenna                             | HFH2-Z2                                | R&S          | 15C                     |