

## FCC Part 15B Compliance Test Report

|                                                         |                                                                                                                                                                                                                                                                                                                                                                   |                                   |                                                                                                                                                   |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Report no.:</b>                                 | FCC15B_RM-824_08                                                                                                                                                                                                                                                                                                                                                  | <b>Date of Report:</b>            | 04-Sep-2012                                                                                                                                       |
| <b>Number of pages:</b>                                 | 17                                                                                                                                                                                                                                                                                                                                                                | <b>Customer's Contact person:</b> | Melava Tia                                                                                                                                        |
| <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-824 / Battery BP-5T / Data Cable CA-190CD / Printer HP DeskJet 1600 / Laptop T40</b>                                                                                                                                                                                                                                                                  |                                   |                                                                                                                                                   |
| <b>FCC ID:</b>                                          | PYARM-824                                                                                                                                                                                                                                                                                                                                                         | <b>IC:</b>                        | 661V-RM824                                                                                                                                        |
| <b>Supplement reports:</b>                              | -                                                                                                                                                                                                                                                                                                                                                                 |                                   |                                                                                                                                                   |
| <b>Testing has been carried out in accordance with:</b> | CFR 47, FCC rules Part 15 Subpart B, ANSI C63.4 (2003), ICES-003, CISPR 22, RSS-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009), RSS-139 (Issue 2, February 2009), RSS-210 (Issue 8, December 2010). 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>             |                                                                                                                                                                                                                                                                                                                                                                   |                                   |                                                                                                                                                   |

Hannu Söderholm, Senior Engineer, EMC

## 1. Summary for FCC Part 15B Compliance Test Report

|                               |                                                     |
|-------------------------------|-----------------------------------------------------|
| Date of receipt               | 11-Jul-2012                                         |
| Testing completed             | 28-Aug-2012                                         |
| The customer's contact person | Melava Tia                                          |
| Test Plan referred to         | T:\Projects\RM-824\TestPlan\RS_testplan_RM-824.xlsm |
| Notes                         | -                                                   |
| Document name                 | T:\Projects\RM-824\EMC\FCC15B_RM-824_08.docx        |

### 1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:

GSM/WCDMA/WLAN/Bluetooth

The EUT is tested with maximum rated TX power.

Devices under tests

| Product    | Type            | SN                          | HW               | MV | SW                       | DUT   |
|------------|-----------------|-----------------------------|------------------|----|--------------------------|-------|
| Phone      | RM-824          | 004402139761492             | 2210             | -  | 1225.0001.8422.9704.1043 | 42847 |
| Battery    | BP-5T           | 3932132224140100129;0670665 | -                | -  | -                        | 42844 |
| Data Cable | CA-190CD        | -                           | -                | -  | -                        | 42778 |
| Printer    | HP DeskJet 1600 | -                           | -                | -  | -                        | 40077 |
| Laptop     | T40             | 99ARTGD                     | 2373-NG3         | -  | Windows XP sp3           | 41868 |
| Phone      | RM-824          | 004402139761583             | S2.21            | -  | 1123.0005.8325.9680.151  | 42848 |
| Battery    | BP-5T           | 3932132224140100119;0670665 | PWB Ver.1.0      | -  | -                        | 42851 |
| Headset    | WH-208          | 06940J32023321              | -                | -  | -                        | 42852 |
| AC charger | AC-50E          | 4090492023260400600;0675619 | HW0.5MW0.4PV04   | -  | -                        | 42785 |
| Data cable | CA-190CD        | -                           | -                | -  | -                        | 42786 |
| Phone      | RM-824          | 004402139761153             | 2210             | -  | 1230.0015.8441.9735.241  | 42877 |
| Battery    | BP-5T           | 3932132224140100127;0670665 | PWB Ver.1.0 Sony | -  | -                        | 42846 |

## 1.2. Summary of Test Results

### GSM850:

| Section in CFR 47 | Section in ICES-003 (RSS-132) | Name of the test                 | Result |
|-------------------|-------------------------------|----------------------------------|--------|
| 15.107, a         | 5.3                           | AC powerline conducted emissions | PASSED |
| 15.109, a         | 5.5 (4.6)                     | Radiated emissions               | PASSED |

### GSM1900:

| Section in CFR 47 | Section in ICES-003 (RSS-133) | Name of the test                 | Result |
|-------------------|-------------------------------|----------------------------------|--------|
| 15.107, a         | 5.3                           | AC powerline conducted emissions | NP     |
| 15.109, a         | 5.5 (6.6)                     | Radiated emissions               | PASSED |

### WCDMA 1700 (Band IV):

| Section in CFR 47 | Section in ICES-003 (RSS-139) | Name of the test                 | Result |
|-------------------|-------------------------------|----------------------------------|--------|
| 15.107, a         | 5.3                           | AC powerline conducted emissions | NP     |
| 15.109, a         | 5.5 (6.6)                     | Radiated emissions               | PASSED |

### LTE700 (Band 17):

| Section in CFR 47 | Section in ICES-003 (RSS-133) | Name of the test                 | Result |
|-------------------|-------------------------------|----------------------------------|--------|
| 15.107, a         | 5.3                           | AC powerline conducted emissions | NP     |
| 15.109, a         | 5.5 (6.6)                     | Radiated emissions               | PASSED |

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.

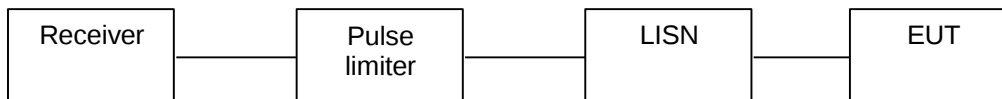
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## 2. AC powerline conducted emissions (FCC §15.107, ICES-003 section 5.3)

|                                                        |                                                                                      |
|--------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-824, DUT 42848                                                                    |
| <b>Accessories with DUT numbers</b>                    | BP-5T, DUT 42844 ; CA-190CD, DUT 42778 ; HP DeskJet 1600, DUT 40077 ; T40, DUT 41868 |
| <b>Operation Voltage [V] / [Hz]</b>                    | 115V / 60                                                                            |
| <b>Results</b>                                         | PASSED                                                                               |
| <b>Remarks</b>                                         | Continuous data transfer was active between the phone and the                        |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 21 / 53 / 100.1                                                                      |
| <b>Date of measurements</b>                            | 13-Jul-2012                                                                          |
| <b>Measured by</b>                                     | Jari Jantunen                                                                        |

### 2.1. Test Setup



### 2.2. Test method and limit

The measurement is made according to ANSI C63.4-2003 as follows:

The EUT is placed on a wooden table 80 cm above the reference groundplane.

The EUT is connected via LISN to a test power supply.

The measurement results are obtained as described below:

$$U [dB\mu V] = U_{RX} + A_{TOT}$$

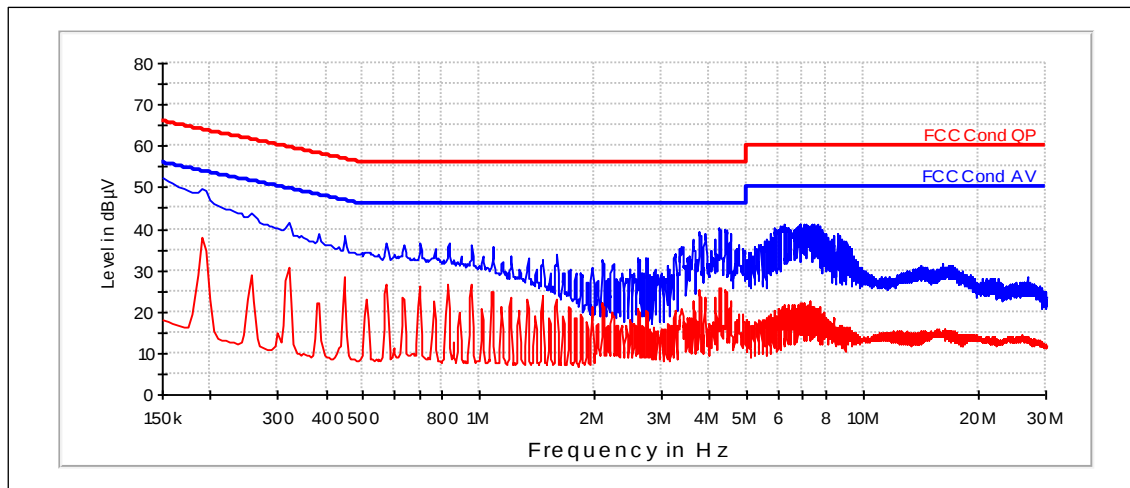
Where  $U_{RX}$  is receiver reading and  $A_{TOT}$  is total correction factor including cable and pulse limiter attenuations.

CISPR 22 Class B limits

| Frequency range [MHz] | Quasi peak limit [dBμV] | Average limit [dBμV] |
|-----------------------|-------------------------|----------------------|
| 0.15 - 0.5            | 66 - 56                 | 56 - 46              |
| 0.5 - 5               | 56                      | 46                   |
| 5 - 30                | 60                      | 50                   |

## 2.3. GSM 850 Test results

Channel 190 / 836.6 MHz

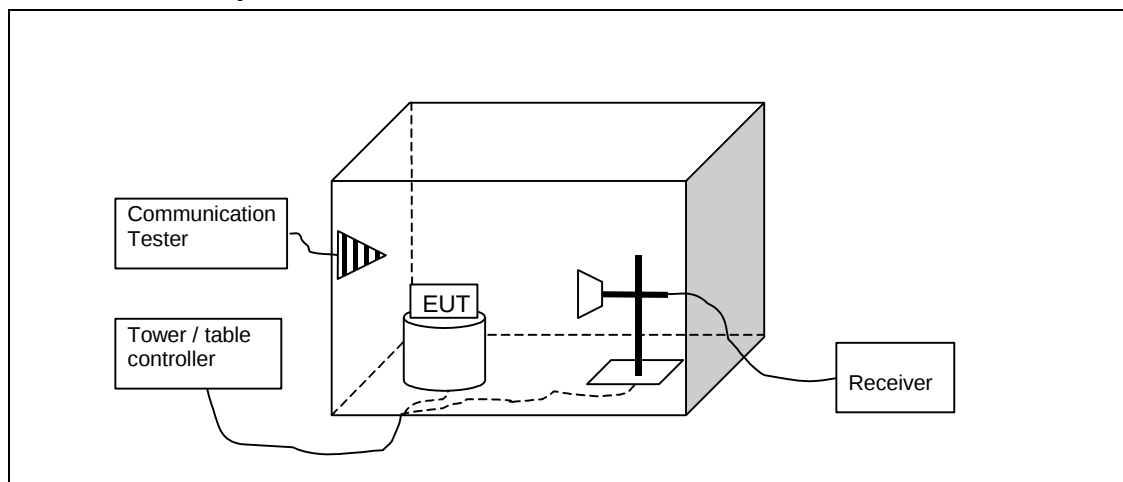


### 3. Radiated emissions

(FCC §15.109, ICES-003 section 5.5, RSS-132 4.6, RSS-133 6.6, RSS-139 6.6)

|                                                 |                                                                                      |
|-------------------------------------------------|--------------------------------------------------------------------------------------|
| EUT with DUT number                             | RM-824, DUT 42847                                                                    |
| Accessories with DUT numbers                    | BP-5T, DUT 42844 ; CA-190CD, DUT 42778 ; HP DeskJet 1600, DUT 40077 ; T40, DUT 41868 |
| Operation Voltage [V] / [Hz]                    | 115 / 60                                                                             |
| Results                                         | PASSED                                                                               |
| Remarks                                         | Continuous data transfer was active between the phone and the                        |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 21 / 53 / 98.5                                                                       |
| Date of measurements                            | 12-Jul-2012                                                                          |
| Measured by                                     | Timo Raiskio                                                                         |

#### 3.1.1 Test Setup



#### 3.2. Test method and limit

The measurement is made according to ANSI C63.4-2003as follows:

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.

The EUT is placed on a nonconductive plate at 80 cm height.

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 measurement results are obtained as described below:

$$E [dB\mu V/m] = U_{RX} + A_{TOT}$$

Where  $U_{RX}$  is receiver reading and  $A_{TOT}$  is total correction factor including cable loss, antenna factor and preamplifier gain ( $A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$ ).

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

| Frequency range [MHz] | Quasi peak limit [dB $\mu$ V/m] | Average limit [dB $\mu$ V/m] | Peak limit [dB $\mu$ V/m] |
|-----------------------|---------------------------------|------------------------------|---------------------------|
| 30 - 230              | 40                              | -                            | -                         |
| 230 – 1000            | 47                              | -                            | -                         |
| Above 1000            | -                               | 54                           | 74                        |

### 3.3. LTE700 Lower (Band 17) Test results

Channel 23755 / 706.5 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 1474.3          | 37.48      | 74.817   | 53.48                  | -16                   | 36.5   | 74             | PASSED  |
| 2210.5          | 42.07      | 126.838  | 51.45                  | -9.38                 | 31.9   | 74             | PASSED  |
| 3001.7          | 37.42      | 74.336   | 44.24                  | -6.82                 | 36.6   | 74             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 1474.3          | 24.47      | 16.722   | 40.47                  | -16                   | 29.5   | 54             | PASSED  |
| 2210.5          | 29.07      | 28.409   | 38.45                  | -9.38                 | 24.9   | 54             | PASSED  |
| 3001.7          | 24.87      | 17.511   | 31.69                  | -6.82                 | 29.1   | 54             | PASSED  |

Channel 23790 / 710 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 1478.4          | 37.35      | 73.739   | 53.47                  | -16.12                | 36.6   | 74             | PASSED  |
| 2221.4          | 42.34      | 130.858  | 51.81                  | -9.47                 | 31.7   | 74             | PASSED  |
| 3001.9          | 37.69      | 76.639   | 44.52                  | -6.83                 | 36.3   | 74             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 1478.4          | 24.3       | 16.408   | 40.42                  | -16.12                | 29.7   | 54             | PASSED  |
| 2221.4          | 29.08      | 28.441   | 38.55                  | -9.47                 | 24.9   | 54             | PASSED  |
| 3001.9          | 24.87      | 17.511   | 31.7                   | -6.83                 | 29.1   | 54             | PASSED  |

Channel 23825 / 713.5 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 1488.9          | 37.24      | 72.812   | 53.47                  | -16.23                | 36.8   | 74             | PASSED  |
| 2232            | 41.91      | 124.638  | 51.09                  | -9.18                 | 32.1   | 74             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 1488.9          | 24.19      | 16.207   | 40.42                  | -16.23                | 29.8   | 54             | PASSED  |
| 2232            | 29.2       | 28.83    | 38.38                  | -9.18                 | 24.8   | 54             | PASSED  |

### 3.4. GSM1900 Test results

RX mode, channel 512 / 1930.2 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 3861.4          | 40.45      | 105.366  | 43.58                  | -3.13                 | 33.5   | 74             | PASSED  |
| 7719.4          | 44.9       | 175.732  | 42.53                  | 2.37                  | 29.1   | 74             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 3861.4          | 27.26      | 23.065   | 30.39                  | -3.13                 | 26.7   | 54             | PASSED  |
| 7719.4          | 32.11      | 40.327   | 29.74                  | 2.37                  | 21.9   | 54             | PASSED  |

RX mode, channel 661 / 1960 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 3001            | 37.96      | 79.095   | 44.78                  | -6.82                 | 36     | 74             | PASSED  |
| 3922            | 40.4       | 104.725  | 43.71                  | -3.31                 | 33.6   | 74             | PASSED  |
| 7838.3          | 45.84      | 195.862  | 43.31                  | 2.53                  | 28.2   | 74             | PASSED  |

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 31.68           | 20.63      | 10.754   | 42.77                  | -22.14                | 19.4   | 40             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 3001            | 24.94      | 17.662   | 31.76                  | -6.82                 | 29.1   | 54             | PASSED  |
| 3922            | 27.25      | 23.03    | 30.56                  | -3.31                 | 26.8   | 54             | PASSED  |
| 7838.3          | 32.6       | 42.643   | 30.07                  | 2.53                  | 21.4   | 54             | PASSED  |

RX mode, channel 810 / 1989.8 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 3981.7          | 41.05      | 112.902  | 44.11                  | -3.06                 | 32.9   | 74             | PASSED  |
| 7960.3          | 46.2       | 204.103  | 43.58                  | 2.62                  | 27.8   | 74             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 3981.7          | 28.05      | 25.264   | 31.11                  | -3.06                 | 26     | 54             | PASSED  |
| 7960.3          | 32.75      | 43.416   | 30.13                  | 2.62                  | 21.2   | 54             | PASSED  |

### 3.5. GSM850 Test results Test results

RX mode, channel 128 / 869.2 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 3478.5          | 38.87      | 87.821   | 44.51                  | -5.64                 | 35.1   | 74             | PASSED  |
| 6953.1          | 47.22      | 229.562  | 46.8                   | 0.42                  | 26.8   | 74             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 3478.5          | 26.2       | 20.42    | 31.84                  | -5.64                 | 27.8   | 54             | PASSED  |
| 6953.1          | 34.62      | 53.839   | 34.2                   | 0.42                  | 19.4   | 54             | PASSED  |

RX mode, channel 190 / 881.6 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 87.384          | 32.94      | 44.371   | 69.3                   | -36.36                | 7.1    | 40             | PASSED  |
| 114.559         | 32.66      | 42.929   | 65.94                  | -33.28                | 10.8   | 43.5           | PASSED  |
| 159.71          | 36.42      | 66.245   | 71.53                  | -35.11                | 7.1    | 43.5           | PASSED  |
| 203.138         | 30.4       | 33.098   | 66.04                  | -35.64                | 13.1   | 43.5           | PASSED  |
| 432.675         | 37.91      | 78.569   | 66.8                   | -28.89                | 8.1    | 46             | PASSED  |
| 466.028         | 34.9       | 55.565   | 63.72                  | -28.82                | 11.1   | 46             | PASSED  |
| 496.604         | 34.3       | 51.862   | 62.96                  | -28.66                | 11.7   | 46             | PASSED  |
| 565.842         | 34.94      | 55.873   | 62.1                   | -27.16                | 11.1   | 46             | PASSED  |
| 663.215         | 30.38      | 33.029   | 54.65                  | -24.27                | 15.6   | 46             | PASSED  |
| 800.992         | 36.69      | 68.312   | 60.39                  | -23.7                 | 9.3    | 46             | PASSED  |

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 7819.942        | 44.9       | 175.813  | 42.4                   | 2.5                   | 29.1   | 74             | PASSED  |
| 7848.797        | 45.41      | 186.466  | 42.91                  | 2.5                   | 28.6   | 74             | PASSED  |
| 7854.411        | 45.3       | 184.014  | 42.79                  | 2.51                  | 28.7   | 74             | PASSED  |
| 7862.225        | 45.85      | 196.155  | 43.31                  | 2.54                  | 28.1   | 74             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 7819.942        | 32.29      | 41.162   | 29.79                  | 2.5                   | 21.7   | 54             | PASSED  |
| 7848.797        | 32.52      | 42.243   | 30.02                  | 2.5                   | 21.5   | 54             | PASSED  |
| 7854.411        | 32.58      | 42.54    | 30.07                  | 2.51                  | 21.4   | 54             | PASSED  |
| 7862.225        | 32.66      | 42.929   | 30.12                  | 2.54                  | 21.3   | 54             | PASSED  |

RX mode, channel 251 / 893.8 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 3576.6          | 38.97      | 88.787   | 44.39                  | -5.42                 | 35     | 74             | PASSED  |
| 7151.3          | 43.56      | 150.73   | 42.27                  | 1.29                  | 30.4   | 74             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

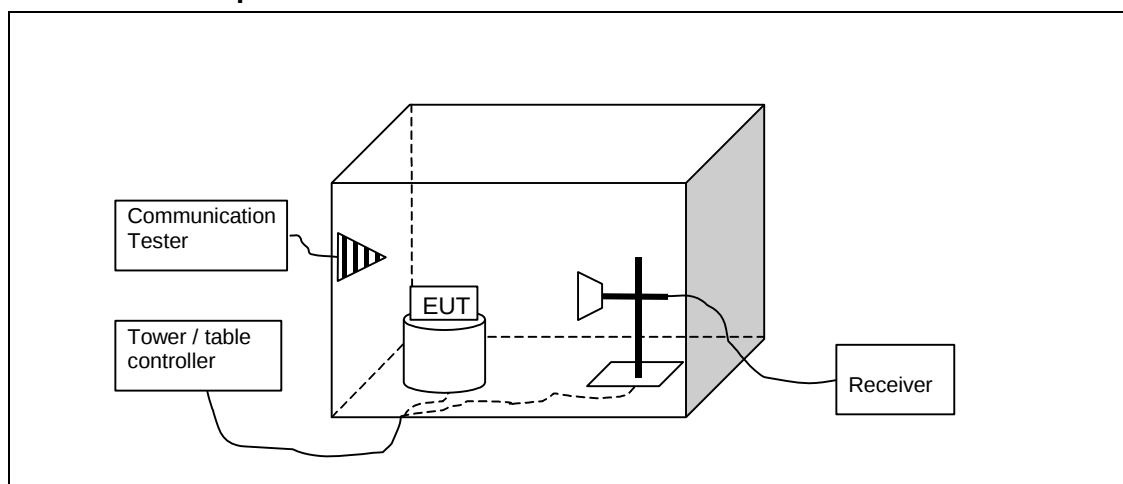
| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 3576.6          | 26.08      | 20.14    | 31.5                   | -5.42                 | 27.9   | 54             | PASSED  |
| 7151.3          | 31.15      | 36.079   | 29.86                  | 1.29                  | 22.9   | 54             | PASSED  |

## 4. Radiated emissions

(FCC §15.109, ICES-003 section 5.5, RSS-132 4.6, RSS-133 6.6, RSS-139 6.6)

|                                                 |                                                                                      |
|-------------------------------------------------|--------------------------------------------------------------------------------------|
| EUT with DUT number                             | RM-824, DUT 42877                                                                    |
| Accessories with DUT numbers                    | BP-5T, DUT 42844 ; CA-190CD, DUT 42778 ; HP DeskJet 1600, DUT 40077 ; T40, DUT 41868 |
| Operation Voltage [V] / [Hz]                    | 115 / 60                                                                             |
| Results                                         | PASSED                                                                               |
| Remarks                                         | Continuous data transfer was active between the phone and the                        |
| Temp [°C] / Humidity [%RH] / Air Pressure [kPa] | 22 / 50 / 98.9                                                                       |
| Date of measurements                            | 28-Aug-2012                                                                          |
| Measured by                                     | Timo Raiskio                                                                         |

### 4.1.1 Test Setup



## 4.2. Test method and limit

The measurement is made according to ANSI C63.4-2003as follows:

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.

The EUT is placed on a nonconductive plate at 80 cm height.

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 measurement results are obtained as described below:

$$E [dB\mu V/m] = U_{RX} + A_{TOT}$$

Where  $U_{RX}$  is receiver reading and  $A_{TOT}$  is total correction factor including cable loss, antenna factor and preamplifier gain ( $A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$ ).

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

| Frequency range [MHz] | Quasi peak limit [dBμV/m] | Average limit [dBμV/m] | Peak limit [dBμV/m] |
|-----------------------|---------------------------|------------------------|---------------------|
| 30 - 230              | 40                        | -                      | -                   |
| 230 – 1000            | 47                        | -                      | -                   |
| Above 1000            | -                         | 54                     | 74                  |

### 4.3. WCDMA 1700 (Band IV) test results

Channel 1312 / 1712.4 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 2133.467        | 66.77      | 2180.218 | 78.54                  | -11.77                | 7.2    | 74             | PASSED  |
| 4225.6          | 39.25      | 91.738   | 43.18                  | -3.93                 | 34.7   | 74             | PASSED  |
| 6338.8          | 44.6       | 169.727  | 45.69                  | -1.09                 | 29.4   | 74             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 2133.467        | 51.97      | 396.826  | 63.74                  | -11.77                | 2      | 54             | PASSED  |
| 4225.6          | 26.14      | 20.272   | 30.07                  | -3.93                 | 27.9   | 54             | PASSED  |
| 6338.8          | 31.6       | 38.01    | 32.69                  | -1.09                 | 22.4   | 54             | PASSED  |

Channel 1450 / 1740.0 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 161.55          | 37.34      | 73.578   | 72.33                  | -34.99                | 6.2    | 43.5           | PASSED  |
| 199.83          | 34.66      | 54.051   | 70.34                  | -35.68                | 8.8    | 43.5           | PASSED  |
| 221.172         | 32.12      | 40.374   | 67.08                  | -34.96                | 13.9   | 46             | PASSED  |
| 257.064         | 38.68      | 85.921   | 72.25                  | -33.57                | 7.3    | 46             | PASSED  |
| 397.556         | 23.93      | 15.724   | 53.4                   | -29.47                | 22.1   | 46             | PASSED  |
| 399.9           | 23.47      | 14.916   | 53.88                  | -30.41                | 22.5   | 46             | PASSED  |
| 431.096         | 32.47      | 42.01    | 61.28                  | -28.81                | 13.5   | 46             | PASSED  |
| 501.353         | 34.54      | 53.327   | 62.85                  | -28.31                | 11.5   | 46             | PASSED  |
| 900.761         | 37.16      | 72.144   | 58.32                  | -21.16                | 8.8    | 46             | PASSED  |

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 7844.288        | 44.67      | 171.277  | 42.19                  | 2.48                  | 29.3   | 74             | PASSED  |
| 7862.124        | 44.79      | 173.54   | 42.33                  | 2.46                  | 29.2   | 74             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 7844.792        | 31.87      | 39.206   | 29.4                   | 2.48                  | 22.1   | 54             | PASSED  |
| 7862.124        | 32.08      | 40.188   | 29.62                  | 2.46                  | 21.9   | 54             | PASSED  |

Channel 1513 / 1752.6 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 4303.9          | 39.25      | 91.696   | 43.37                  | -4.12                 | 34.8   | 74             | PASSED  |
| 6456            | 45.99      | 199.388  | 47.2                   | -1.21                 | 28     | 74             | PASSED  |

Average (RBW: 1 MHz, VBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Margin | Limit [dBμV/m] | Results |
|-----------------|------------|----------|------------------------|-----------------------|--------|----------------|---------|
| 4303.9          | 26.45      | 21.016   | 30.57                  | -4.12                 | 27.5   | 54             | PASSED  |
| 6456            | 32.74      | 43.331   | 33.95                  | -1.21                 | 21.3   | 54             | PASSED  |

## 5. Test Equipment

### 5.1. Conducted measurements

| Eq. No  | Equipment                           | Type        | Manufacturer  | Used in            |
|---------|-------------------------------------|-------------|---------------|--------------------|
| TM38112 | Power supply                        | 6632A       | Agilent       | 22/24/27, 15C      |
| TM38631 | Signal Generator                    | 83640L      | Agilent       | 22/24/27, 15C, 15B |
| OM06312 | Signal Generator                    | E4422B      | Agilent       | 22/24              |
| 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      |
| 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              |
| 2058    | Receiver                            | ESPC        | R&S           | 15C, 15B           |
| 2001    | Bluetooth tester                    | CBT         | R&S           | 22/24/27, 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                |
| 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, 15B |
| TM38323 | Preamplifier                        | PA-02 18-26 GHz                        | EMC Automation | 22/24/27, 15C, 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, 15C, 15B |
| TM38845 | Receiver                            | ESIB 26                                | R&S            | 22/24/27, 15C, 15B |
| -       | Antenna                             | HL562                                  | R&S            | 22/24/27, 15C, 15B |
| -       | Turntable                           | 2188                                   | EMCO           | 22/24/27, 15C, 15B |
| -       | Turntable controller                | 2090                                   | EMCO           | 22/24/27, 15C, 15B |
| -       | RF system panel                     | TS-RSP                                 | R&S            | 22/24/27, 15C, 15B |
| -       | RF system panel                     | TS-RSP                                 | R&S            | 22/24/27, 15C, 15B |
| -       | Mini mast                           | 2075-2                                 | ETS Lindgren   | 22/24/27, 15C, 15B |
| 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 |
| TM39180 | Laser distance meter                | Disto Pro                              | Leica          | 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, 15B |
| TM38066 | High pass filter                    | 4HC3000/18000-3-KK                     | Trilithic      | 22/24/27, 15C, 15B |
| -       | High pass filter                    | WHKX 1.6/15G-12SS                      | Wainwright     | 22/24/27, 15C, 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            | 22/24/27, 15C, 15B |
| 6023    | Antenna                             | VUBA 9117                              | Schwarzbeck    | 22/24/27, 15C      |