

## FCC Part 15B Compliance Test Report

|                                                         |                                                                                                                                                                                                                                                                                                                                                                                  |                                   |                                                                                                                                                         |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Report no.:</b>                                 | Salo_FCC_0832_24.doc                                                                                                                                                                                                                                                                                                                                                             | <b>Date of Report:</b>            | 13-Aug-2008                                                                                                                                             |
| <b>Number of pages:</b>                                 | 8                                                                                                                                                                                                                                                                                                                                                                                | <b>Customer's Contact person:</b> | Markku Porttila                                                                                                                                         |
| <b>Testing laboratory:</b>                              | TCC Nokia Salo Laboratory<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>Customer:</b>                  | Nokia Corporation<br>Nokia House<br>Summit Avenue, Southwood<br>FARNBOROUGH<br>HAMPSHIRE GU14 0NG<br>UK<br>Tel. +44 1252 866000<br>Fax. +44 1252 866001 |
| <b>FCC listing no.:</b>                                 | 533467                                                                                                                                                                                                                                                                                                                                                                           |                                   |                                                                                                                                                         |
| <b>IC recognition no.:</b>                              | 661V-1                                                                                                                                                                                                                                                                                                                                                                           |                                   |                                                                                                                                                         |
| <b>Tested devices/ accessories:</b>                     | <b>Phone RM-348 / Battery BL-6F, Headset HS-45, Audio Adapter, AD-54 and AC-Charger AC-5</b>                                                                                                                                                                                                                                                                                     |                                   |                                                                                                                                                         |
| <b>FCC ID:</b>                                          | QFXRM-348                                                                                                                                                                                                                                                                                                                                                                        | <b>IC:</b>                        | 661Z-RM348                                                                                                                                              |
| <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 and IC standards RSS-132 (Issue 2, September 2005), RSS-133 (Issue 4, February 2008), RSS-139 (Issue 1, February 2008) and RSS-210 (Issue 7, June 2007). 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>             |                                                                                                                                                                                                                                                                                                                                                                                  |                                   |                                                                                                                                                         |

Sami Lehtonen, Test System Manager

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

|                               |                                                         |
|-------------------------------|---------------------------------------------------------|
| Date of receipt               | 25-Jun-2008                                             |
| Testing completed             | 07-Aug-2008                                             |
| The customer's contact person | Markku Porttila                                         |
| Test Plan referred to         | T:\Projects\RM-348\TestPlan_RS\RS_Testplan_RM-348.xls   |
| Notes                         | -                                                       |
| Document name                 | T:\Projects\RM-348\EMC\Results\FCC\Salo_FCC_0832_24.doc |

### 1.1. EUT and Accessory Information

The EUT is a 6-band (GSM850/900/1800/1900 and WCDMA Band I/VIII) mobile phone with GPRS, EGPRS, Bluetooth, WLAN and FM transmitter. GSM bands are tested in idle mode. Bluetooth and WLAN are tested with maximum rated TX power.

| Product       | Type   | SN                          | HW   | MV | SW   | DUT   |
|---------------|--------|-----------------------------|------|----|------|-------|
| Phone         | RM-348 | 004401100962808             | 4000 | -  | 0.70 | 13090 |
| Battery       | BL-6F  | 3820668142152343221;0670523 | -    | -  | -    | 13092 |
| Audio Adapter | AD-54  | 07911968191C17400109        | -    | -  | -    | 13095 |
| Headset       | HS-45  | -                           | -    | -  | -    | 13094 |
| AC-Charger    | AC-5E  | 3943497396090606251;0675540 | -    | -  | -    | 13093 |

### 1.2. Summary of Test Results

#### Bluetooth:

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

PASSED

The EUT complies with the essential requirements in the standard.

FAILED

The EUT does not comply with the essential requirements in the standard.

NP

The test was not performed by the TCC Nokia Salo Laboratory.

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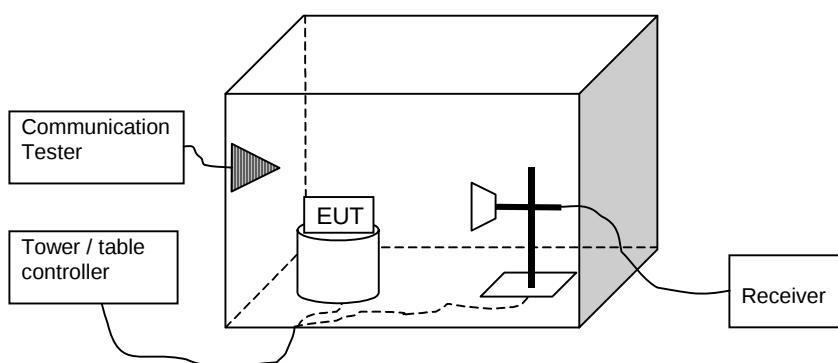
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## 2. Radiated emissions

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

|                                                        |                                                                        |
|--------------------------------------------------------|------------------------------------------------------------------------|
| <b>EUT with DUT number</b>                             | RM-348, DUT 13090                                                      |
| <b>Accessories with DUT numbers</b>                    | BL-6f, DUT 13092; HS-45, DUT 13094; AD-54, DUT 13095; AC-5E, DUT 13093 |
| <b>Operation Voltage [V] / [Hz]</b>                    | 115 / 60                                                               |
| <b>Result</b>                                          | PASSED                                                                 |
| <b>Remarks</b>                                         | GPS is active in test                                                  |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b> | 19 / 41 / 100.4                                                        |
| <b>Date of measurements</b>                            | 07-Aug-2008                                                            |
| <b>Measured by</b>                                     | Sami Lehtonen / Kalle Hannila                                          |

### 2.1. Test setup



### 2.2. 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:

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

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

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                  |

## 2.3. Bluetooth Test results

TX mode, channel 0 / 2402 MHz

Peak (RBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 4804.000000     | 44.60      | 169.82   | 43.60                  | 1.0                   | VERTICAL     | PASSED |
| 7206.000000     | 47.60      | 239.88   | 44.70                  | 2.9                   | VERTICAL     | PASSED |

Average (RBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 4804.000000     | 31.90      | 39.36    | 30.90                  | 1.0                   | HORIZONTAL   | PASSED |
| 7206.000000     | 34.30      | 51.88    | 31.40                  | 2.9                   | VERTICAL     | PASSED |

TX mode, channel 40 / 2442 MHz

Quasi peak (RBW: 120 kHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 4849.195391     | 45.40      | 186.21   | 43.80                  | 1.6                   | VERTICAL     | PASSED |
| 12503.500000    | 52.70      | 431.52   | 41.00                  | 11.7                  | HORIZONTAL   | PASSED |
| 13323.151303    | 53.60      | 478.63   | 40.80                  | 12.8                  | VERTICAL     | PASSED |
| 15376.751503    | 56.50      | 668.34   | 38.20                  | 18.3                  | VERTICAL     | PASSED |
| 15795.085170    | 55.60      | 602.56   | 37.70                  | 17.9                  | VERTICAL     | PASSED |
| 16041.588176    | 56.70      | 683.91   | 36.20                  | 20.5                  | HORIZONTAL   | PASSED |
| 17952.905812    | 57.30      | 732.82   | 37.40                  | 19.9                  | VERTICAL     | PASSED |

Average (RBW: 1 MHz)

| Frequency [MHz] | E [dBμV/m] | E [μV/m] | U <sub>RX</sub> [dBμV] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------|----------|------------------------|-----------------------|--------------|--------|
| 4850.695391     | 32.20      | 40.74    | 30.60                  | 1.6                   | VERTICAL     | PASSED |
| 12500.000000    | 40.10      | 101.16   | 28.40                  | 11.7                  | HORIZONTAL   | PASSED |
| 13326.651303    | 40.50      | 105.93   | 27.70                  | 12.8                  | VERTICAL     | PASSED |
| 15376.751503    | 43.40      | 147.91   | 25.10                  | 18.3                  | VERTICAL     | PASSED |
| 15791.585170    | 42.80      | 138.04   | 25.00                  | 17.8                  | VERTICAL     | PASSED |
| 16047.088176    | 44.50      | 167.88   | 23.80                  | 20.7                  | HORIZONTAL   | PASSED |
| 17954.905812    | 44.90      | 175.79   | 24.90                  | 20.0                  | VERTICAL     | PASSED |

TX mode, channel 78 / 2480 MHz

Peak (RBW: 1 MHz)

| Frequency [MHz] | E [dB $\mu$ V/m] | E [ $\mu$ V/m] | U <sub>RX</sub> [dB $\mu$ V] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------------|----------------|------------------------------|-----------------------|--------------|--------|
| 4960.000000     | 43.40            | 147.91         | 43.20                        | 0.2                   | HORIZONTAL   |        |
| 7440.000000     | 47.90            | 248.31         | 43.50                        | 4.4                   | HORIZONTAL   |        |

Average (RBW: 1 MHz)

| Frequency [MHz] | E [dB $\mu$ V/m] | E [ $\mu$ V/m] | U <sub>RX</sub> [dB $\mu$ V] | A <sub>TOT</sub> [dB] | Polarisation | Result |
|-----------------|------------------|----------------|------------------------------|-----------------------|--------------|--------|
| 4960.000000     | 30.80            | 34.67          | 30.60                        | 0.2                   | VERTICAL     |        |
| 7440.000000     | 35.10            | 56.89          | 30.70                        | 4.4                   | VERTICAL     |        |

### 3. Test Equipment

#### 3.1. Conducted measurements

| Eq. No | Equipment                          | Type            | Manufacturer            | Used in            |
|--------|------------------------------------|-----------------|-------------------------|--------------------|
| 1742   | EMI Test Receiver                  | ESMI            | R&S                     | 15C, 15B           |
| 1759   | LISN 50 µH                         | ESH3-Z5         | R&S                     | 15C, 15B           |
| 1872   | Thermo- Hygrograph                 | 00.02520.150700 | Lambrecht               | 15C, 15B           |
| 1916   | Radio Communication tester         | CMTA84          | R&S                     | 15C, 15B           |
| 2039   | Power Supply                       | PL330QMD        | THURLBY                 | 15C, 15B           |
| 2060   | LISN 50 µH                         | ESH3-Z5         | R&S                     | 15C, 15B           |
| 2068   | CDN-Antenna line                   | S1              | NMP                     | 15C, 15B           |
| 2097   | Pulse Limiter                      | ESH3-Z2         | R&S                     | 15C, 15B           |
| 2111   | Multimeter                         | TX3             | Tektronix               | 15C, 15B           |
| 2156   | Digital Radio Communication Tester | CMU200          | R&S                     | 15C, 15B           |
| 2206   | Signal generator                   | SMX             | R&S                     | 15C, 15B           |
| 2335   | GPIB Switch 2 to 1                 | -               | National Instruments    | 15C, 15B           |
| 2347   | Digital Radio Communication Tester | CMU200          | R&S                     | 22/24/27, 15C, 15B |
| 2352   | Spectrum Analyzer                  | FSP             | R&S                     | 22/24/27, 15C      |
| 2359   | Temperature Test system            | VT4002          | Vötsch Industrietechnik | 22/24/27           |
| 2360   | Serial Bus Converter               | Serial 488A     | IO Tech                 | 22/24/27           |
| 2362   | Power Supply                       | NGPX 70/5       | R&S                     | 22/24/27           |
| 2388   | Bluetooth Tester                   | CBT             | R&S                     | 15C, 15B           |
| -      | RF Emission Software               | ES-K1 v.1.71    | R&S                     | 22/24/27, 15C, 15B |

#### 3.2. Radiated measurements

| Eq. No | Equipment                           | Type                   | Manufacturer | Used in            |
|--------|-------------------------------------|------------------------|--------------|--------------------|
| 1748   | Log. per. Antenna                   | HL025                  | R&S          | 22/24/27, 15C      |
| 1749   | Log. per. Antenna                   | HL025                  | R&S          | 22/24/27, 15C      |
| 1875   | Thermo- Hygrograph                  | 00.02520.150700        | Lambrecht    | 22/24/27, 15C, 15B |
| 1917   | Radio Communication tester          | CMTA84                 | R&S          | 22/24/27, 15C, 15B |
| 1933   | Precision half-wave dipole antennas | HZ-13                  | R&S          | 22/24/27, 15C      |
| 1938   | Precision half-wave dipole antennas | HZ-12                  | R&S          | 22/24/27, 15C      |
| 2006   | Radiation Reference Source          | VSQ                    | MEB          | 22/24/27, 15C, 15B |
| 2009   | Signal generator                    | SMP 22                 | R&S          | 22/24/27, 15C, 15B |
| 2019   | Multimeter                          | 34401A                 | HP           | 22/24/27, 15C, 15B |
| 2027   | Coupling and Decoupling Network     | M2 (modified) DC1      | MEB          | 22/24/27, 15C, 15B |
| 2028   | Coupling and Decoupling Network     | M3 (modified) DC2      | MEB          | 22/24/27, 15C, 15B |
| 2029   | Power Supply                        | PL330                  | THURLBY      | 22/24/27, 15C, 15B |
| 2043   | Band Reject Filter                  | WRCA824/849-0.2-6SS    | Wainwright   | 22, 15C, 15B       |
| 2047   | Band Reject Filter                  | WRCC1800/2000-0.2-10SS | Wainwright   | 24, 15C, 15B       |
| 2048   | Band Reject Filter                  | WRCC1700/1800-0.2-10SS | Wainwright   | 27, 15C, 15B       |
| 2051   | High Pass Filter                    | 4HC1700-1-KK           | R&S          | 22/24/27, 15C      |
| 2057   | Log. per. Antenna                   | HL025                  | R&S          | 22/24/27, 15C      |
| 2109   | Power Supply                        | PL330QMD               | THURLBY      | 22/24/27, 15C, 15B |
| 2110   | Multimeter                          | 34401A                 | HP           | 22/24/27, 15C, 15B |
| 2112   | Multimeter                          | TX3                    | Tektronix    | 22/24/27, 15C, 15B |
| 2116   | Controller                          | EMCO MODEL 2090        | ETS          | 22/24/27, 15C, 15B |
| 2133   | Power Meter                         | NRVS                   | R&S          | 22/24/27, 15C      |
| 2134   | Power Sensor                        | NRV-Z32                | R&S          | 22/24/27, 15C      |
| 2135   | Coupling and Decoupling Network     | CDN 801-M3             | LÜTHI        | 22/24/27, 15C, 15B |

| Eq. No | Equipment                          | Type                               | Manufacturer         | Used in            |
|--------|------------------------------------|------------------------------------|----------------------|--------------------|
| 2138   | Ultra Broadband Antenna            | HL562                              | R&S                  | 22/24/27, 15C, 15B |
| 2140   | Biconical Antenna                  | EMCO93110B                         | EMCO                 | 22/24/27, 15C      |
| 2142   | Log.-per.-dipol Antenna            | 3146                               | EMCO                 | 22/24/27, 15C      |
| 2144   | Attenuator                         | 6803.17B                           | Huber-Suhner         | 22/24/27, 15C, 15B |
| 2150   | High Pass Filter                   | F-15041                            | RLC ELECTRONICS      | 22/24/27, 15C      |
| 2176   | Coupling and Decoupling Network    | CDN 801-M3                         | LÜTHI                | 22/24/27, 15C, 15B |
| 2180   | Digital Radio Communication Tester | CMU200                             | R&S                  | 22/24/27, 15C, 15B |
| 2188   | Preamplifier                       | AFS4-00100300-20-23P-6             | MITEQ                | 22/24/27, 15C, 15B |
| 2330   | EMI Test receiver                  | ESIB26                             | R&S                  | 22/24/27, 15C, 15B |
| 2334   | GPIB Switch 2 to 1                 | -                                  | National Instruments | 22/24/27, 15C, 15B |
| 2348   | Yaesu controller                   | G-1000DXC                          | YAESU                | 22/24/27, 15C, 15B |
| 2349   | Computer controller (Yaesu)        | GS-232B                            | YAESU                | 22/24/27, 15C, 15B |
| 2350   | Preamplifier                       | AMF-6D-020180-29-20P               | MITEQ                | 22/24/27, 15C      |
| 2361   | Anechoic chamber                   | 3 meter semi/full anechoic chamber | Euroshield           | 22/24/27, 15C, 15B |
| 2398   | Horn antenna                       | HF906                              | R&S                  | 22/24/27, 15C      |
| 2363   | Band Reject Filter                 | WRCG 832/838-825/845/5SS           | Wainwright           | 22/24/27           |
| 2364   | Band Reject Filter                 | WRCG1877/1883 - 1870/1890-40/6SS   | Wainwright           | 22/24/27           |
| 2365   | Relay Switch Unit                  | TS-RSP                             | R&S                  | 22/24/27, 15C, 15B |
| 2366   | Relay Switch Unit                  | TS-RSP                             | R&S                  | 22/24/27, 15C, 15B |
| 2384   | Band Reject Filter                 | WRCG832/838-825/845-40/5SS         | Wainwright           | 22/24/27           |
| 2388   | Bluetooth Tester                   | CBT                                | R&S                  | 15C, 15B           |
| -      | RF Emission Software               | ES-K1 v.1.71                       | R&S                  | 22/24/27, 15C, 15B |