# FCC Part 22/24 Compliance Test Report

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|---|---|---|---|
| **Test Report no.:** | Cph_FCC_0832_03.doc | **Date of Report:** | 07-Aug-2008 |
| **Number of pages:** | 6 | **Customer's Contact person:** | Porttila Markku |
| **Testing laboratory:** | TCC Nokia Beijing Laboratory<br>Beijing Economic and<br>Technological Development Area<br>No.5 Donghuan Zhonglu<br>Beijing<br>PRC China 100176<br>Tel. +86 10 8711 8888<br>Fax. +86 10 8711 4550 | **Customer:** | 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 |
| **FCC listing no.:**<br>**IC recognition no.:** | 975940<br>661AH-1 | | |
| **Tested devices/ accessories:** | **Phone RM-350 / Battery BL-6F, AC-charger AC-5, Headset HS-45, Audio adapter AD-54** | | |
| **FCC ID:** | QFXRM-350 | **IC:** | 661Z-RM350 |
| **Supplement reports:** | This report is based on report: Bej_FCC_0827_09 | | |
| **Testing has been carried out in accordance with:** | **CFR 47, FCC rules Parts 22 and 24, TIA-603-C-2004 and IC standards RSS-GEN (Issue 2, June 2007), RSS-132 (Issue 2, September 2005) and RSS-133 (Issue 4, February 2008). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".** | | |
| **Documentation:** | 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. | | |
| **Test Results:** | **The EUT complies with the requirements in respect of all parameters subject to the test.**<br>The test results relate only to devices specified in this document. | | |
| **Date and signature for the contents:** | Test Engineer<br>Digitally signed by Allan Franch Henriksen<br>DN: cn=Allan Franch Henriksen, c=DK, o=Nokia, ou=CertMT, email=allan.f.henriksen@nokia.com<br>Date: 2008.09.17 09:43:10 +02'00' | | |

**Allan F. Henriksen, Manager**

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

| | |
|---|---|
| **Date of receipt** | 01-Jul-2008 |
| **Testing completed** | 11-Jul-2008 |
| **The customer's contact person** | Porttila Markku |
| **Test Plan referred to** | T:\Projects\RM-350\TestPlan_RS\RS_Testplan_RM-350.xls |
| **Notes** | Test results in this report are based on measurements results from report Bej_FCC_0827_09. |
| **Document name** | T:\Projects\RM-350\EMC\Results\FCC\Cph_FCC_0832_03.doc |

## 1.1. EUT and Accessory Information

The EUT is a 6-band (GSM850/900/1800/1900 and WCDMA Band II/V) mobile phone with GPRS, EGPRS, Bluetooth, WLAN and FM transmitter. The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

| Product | Type | SN | HW | MV | SW | DUT |
|---|---|---|---|---|---|---|
| Phone | RM-348 | 004401/10/096089/3 | 4001 | - | 0.70 | 50969 |
| Battery | BL-6F | 382066814215234476l;0670523 | - | - | - | 50971 |
| AC-charger | AC-5E | 3943497405080632681;0675540 | - | - | - | 50859 |
| Headset | HS-45 | 06946447417O1904821 | - | - | - | 50854 |
| Audio adapter | AD-54 | 0750838720102100096 | 0.5 | 1.7 | 0.1 | 50853 |

## 1.2. Summary of Test Results

**GSM 850:**

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

**GSM 1900:**

| 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 | NP |
| §24.232(b) | 6.4 | Radiated RF output power | NP |
| §2.1049(h) | *4.6.1* | 99 % occupied bandwidth | NP |
| §24.238(a) | 6.5 | Band edge compliance | NP |
| §24.238(a), §2.1051 | 6.5 | Spurious emissions at antenna terminals | NP |
| §24.238(a), §2.1053 | 6.5 | Spurious radiated emissions | PASSED |
| §2.1055(a) | 6.3 | Frequency stability, temperature variation | NP |
| §2.1055(d) | 6.3 | Frequency stability, voltage variation | NP |

| | |
|---|---|
| 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 Beijing Laboratory. |



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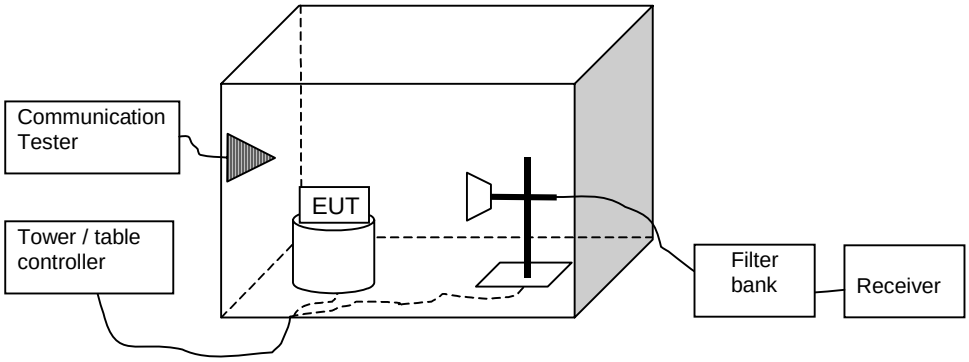
# 2. Spurious radiated emissions

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

| | |
|---|---|
| **EUT with DUT number** | RM-348 DUT 50969 |
| **Accessories with DUT numbers** | BL-6F DUT 50971, AC-5 DUT 50859, HS-45 DUT 50854, AD-54 DUT 50853 |
| **Operation Voltage [V] / [Hz]** | 115 / 60 |
| **Result** | PASSED |
| **Remarks** | - |
| **Temp [°C] / Humidity [%RH] / Air Pressure [kPa]** | 20 / 78 / 100.4 |
| **Date of measurements** | 08-Jul-2008 |
| **Measured by** | Yin Hongpeng |

## 2.1. Test setup




## 2.2. 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.



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

The substitution corrections are obtained as described below:

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

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

The measurement results are obtained as described below:

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

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

Limits for spurious radiated emissions measurements

| Operation band | Frequency range [MHz] | Limit [dBm] |
|---|---|---|
| GSM 850 | 30 - 8500 | -13 |
| GSM 1900 | 30 - 18000 | -13 |

## 2.3. GSM 850 Test results

GSM mode, channel 190 / 836.6 MHz

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|
| 1673.143287 | -41.80 | 0.06607 | -39.40 | -2.40 | VERTICAL | PASSED |
| 2509.820641 | -37.40 | 0.18197 | -42.50 | 5.10 | VERTICAL | PASSED |
| 3356.205411 | -56.30 | 0.00234 | -64.00 | 7.70 | HORIZONTAL | PASSED |

EGPRS mode, channel 190 / 836.6 MHz

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|
| 1673.143287 | -44.80 | 0.03311 | -42.40 | -2.40 | VERTICAL | PASSED |
| 2509.820641 | -43.60 | 0.04365 | -48.70 | 5.10 | VERTICAL | PASSED |
| 3353.205411 | -55.70 | 0.00269 | -63.50 | 7.80 | HORIZONTAL | PASSED |

## 2.4. GSM 1900 Test results

GSM mode, channel 661 / 1880.0 MHz

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|
| 5627.262525 | -50.90 | 0.00813 | -63.20 | 12.30 | HORIZONTAL | PASSED |
| 7516.026052 | -49.80 | 0.01047 | -65.60 | 15.80 | VERTICAL | PASSED |

EGPRS mode, channel 661 / 1880.0 MHz

| Frequency [MHz] | P [dBm] | P [µW] | $P_{MEAS}$ [dBm] | $A_{TOT}$ [dB] | Polarisation | Result |
|---|---|---|---|---|---|---|
| 5634.262525 | -49.70 | 0.01072 | -62.00 | 12.30 | HORIZONTAL | PASSED |
| 7516.526052 | -49.20 | 0.01202 | -65.00 | 15.80 | VERTICAL | PASSED |



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# 3. Test Equipment

## 3.1. Conducted measurements

| Eq. No | Equipment | Type | Manufacturer | Used in |
|---|---|---|---|---|
| BJPCPT0039 | LISN | ESH3-Z5 | BJPCPT0039 | 15C, 15B |
| BJPCPT0040 | TEST RECEIVER | ESCS30 | BJPCPT0040 | 15C, 15B |
| BJPCPT0069 | LISN | ESH3-Z5 | BJPCPT0069 | 15C, 15B |
| BJPCPT0079 | LISN | ESH3-Z5 | BJPCPT0079 | 15C, 15B |
| BJPCPT0191 | PULSE LIMITER | ESH3-Z2 | BJPCPT0191 | 15C, 15B |

## 3.2. Radiated measurements

| Eq. No | Equipment | Type | Manufacturer | Used in |
|---|---|---|---|---|
| BJPCPT0129 | Relay Unit | TS-RSP | Rohde&Schwarz | 22/24/27, 15C, 15B |
| BJPCPT0130 | Relay Unit | TS-RSP | Rohde&Schwarz | 22/24/27, 15C, 15B |
| BJPCPT0080 | Device Controller | EMCO2090 | ETS-EMCO | 22/24/27, 15C, 15B |
| BJPCTC0048 | RF Preamplifier 10MHz-3GHz (Metal chassis) | AFS4-00100300-10-10P-4 | MITEQ | 22/24/27, 15C, 15B |
| BJPCTC0007 | Ultra Broadband Antenna 30MHz-3000MHz | HL562 | Rohde&Schwarz | 22/24/27, 15C, 15B |
| BJPCPT0162 | Horn Antenna 1GHz-18GHz | HF906 | Rohde&Schwarz | 22/24/27, 15C, 15B |
| BJPCTC0029 | Horn Antenna 1GHz-18GHz | HF906 | Rohde&Schwarz | 22/24/27, 15C, 15B |
| BJPCTC0049 | RF preamplifier 3GHz-18GHz | BLMA-0118-1A-BT | Rohde&Schwarz | 22/24/27, 15C, 15B |
| BJPCTC0072 | 3m anechoic chamber | - | ETS-Lindgren | 22/24/27, 15C, 15B |
| BJPCTC0075 | Turntable | Model 2088 | ETS-EMCO | 22/24/27, 15C, 15B |
| BJPCPT0072 | EMI Test Receiver 20Hz-26.5GHz | ESIB26 | Rohde&Schwarz | 22/24/27, 15C, 15B |
| BJPCPT0150 | High Pass filter | WHKS 1200-10SS | Wainwright instruments | 22/24/27, 15C, 15B |
| BJPCTC0034 | Notch Filter | WRCT800/880-0.2/40-5SSK | Wainwright instruments | 22, 15B |
| BJPCPT0151 | Notch Filter | WRCD1800/2000-0.2/40-5SSK | Wainwright instruments | 24, 15B |
| BJPCTC0017 | Radio Communication Tester | CMU200 | Rohde&Schwarz | 22/24/27, 15C, 15B |
| BJPCPT0154 | Filter | WRCT2402/2480-2400/2483.5-30-20SS | Wainwright instruments | 15C, 15B |
| BJPCTC0058 | Bluetooth tester | CBT | Rohde&Schwarz | 15C, 15B |
| BJPCTC0064 | WCDMA II FILTER | WRCG1877/1883-1870/1890-40/6SS | Wainwright instruments | 24, 15B |
| BJPCTC0065 | WCDMA V FILTER | WRCG832/838-825/845-40/5SS | Wainwright instruments | 22, 15B |



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