

## FCC Part 22/24 Compliance Test Report

|                                                         |                                                                                                                                                                                                                                                      |                                   |                                                                                                               |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Test Report no.:</b>                                 | Cph_FCC_0632_08.doc                                                                                                                                                                                                                                  | <b>Date of Report:</b>            | 10-08-2006                                                                                                    |
| <b>Number of pages:</b>                                 | 11                                                                                                                                                                                                                                                   | <b>Customer's Contact person:</b> | Ole Soerensen                                                                                                 |
| <b>Testing laboratory:</b>                              | TCC Nokia Copenhagen Laboratory<br>Frederikskaj<br>1790 COPENHAGEN V<br>DENMARK<br>Tel. +45 33 292929<br>Fax. +45 33 292934                                                                                                                          | <b>Customer:</b>                  | Nokia Corporation<br>Frederikskaj<br>1790 COPENHAGEN V<br>DENMARK<br>Tel. +45 33 292929<br>Fax. +45 33 292934 |
| <b>FCC listing no.:</b>                                 | 99059                                                                                                                                                                                                                                                |                                   |                                                                                                               |
| <b>IC recognition no.:</b>                              | 4820 and 4820-1                                                                                                                                                                                                                                      |                                   |                                                                                                               |
| <b>Tested devices/ accessories:</b>                     | <b>Phone: RM-140 (hw0330), Battery: BP-5M, Headset: HS-60<br/>AC Charger: AC-3E</b>                                                                                                                                                                  |                                   |                                                                                                               |
| <b>FCC ID:</b>                                          | QTKRM-140                                                                                                                                                                                                                                            | <b>IC:</b>                        | 661AD-RM140                                                                                                   |
| <b>Supplement reports:</b>                              | None                                                                                                                                                                                                                                                 |                                   |                                                                                                               |
| <b>Testing has been carried out in accordance with:</b> | <b>CFR 47, FCC rules Parts 22 and 24, TIA-603-B-2002 and IC standards RSS-GEN, RSS-132 and RSS-133. Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".</b> |                                   |                                                                                                               |
| <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>             |                                                                                                                                                                                                                                                      |                                   |                                                                                                               |

Jan Engelbrechtsen, Engineer

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

|                               |                                                                           |
|-------------------------------|---------------------------------------------------------------------------|
| Date of receipt               | 09-08-2006                                                                |
| Testing completed             | 10-08-2006                                                                |
| The customer's contact person | Ole Soerensen                                                             |
| Test Plan referred to         | \\satcc01nmp\tcc_salo\Projects\RM-140\TestPlan_RS\RS_testplan_RM-140.xls  |
| Notes                         | None                                                                      |
| Document name                 | \\satcc01nmp\tcc_salo\Projects\RM-140\EMC\Results\FCC\Cph_FCC_0632_08.doc |

### 1.1. EUT and Accessory Information

The EUT is a quadric band (GSM900/1800/1900 and WCDMA2100) mobile phone with GPRS, EGPRS and Bluetooth. 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-140 | 004400/97/170279/8          | 0330 | -  | Vp 03.14 | 27864 |
| Battery    | BP-5M  | 393213N172110102524;0670509 | -    | -  | -        | 27865 |
| Headset    | HS-60  | -                           | -    | -  | -        | 27866 |
| AC Charger | AC-3E  | 1103336133141301734;0675370 | -    | -  | -        | 27860 |

### 1.2. Summary of Test Results

#### GSM 1900:

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

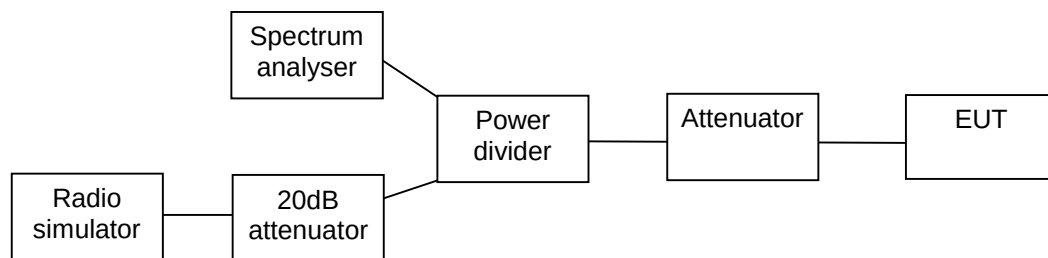
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## 2. 99 % occupied bandwidth (FCC §2.1049(h), RSS-GEN 4.4.1, RSS-133 5.6)

|                                                             |                                   |
|-------------------------------------------------------------|-----------------------------------|
| <b>EUT with DUT number</b>                                  | RM-140 dut 27864, BP-5L dut 27865 |
| <b>Accessories with DUT numbers</b>                         | HS-60 dut 27866, AC-3E dut 27860  |
| <b>Operation Voltage [V] / [Hz]</b>                         | 230 / 50                          |
| <b>Result</b>                                               | Passed                            |
| <b>Remarks</b>                                              | None                              |
| <b>Temp [°C] / Humidity [%RH] /<br/>Air Pressure [mBar]</b> | 25.3 / 44.0<br>1011.5             |
| <b>Date of measurements</b>                                 | 10-08-2006                        |
| <b>Measured by</b>                                          | Jan Engelbrechtsen                |

### 2.1. Test setup



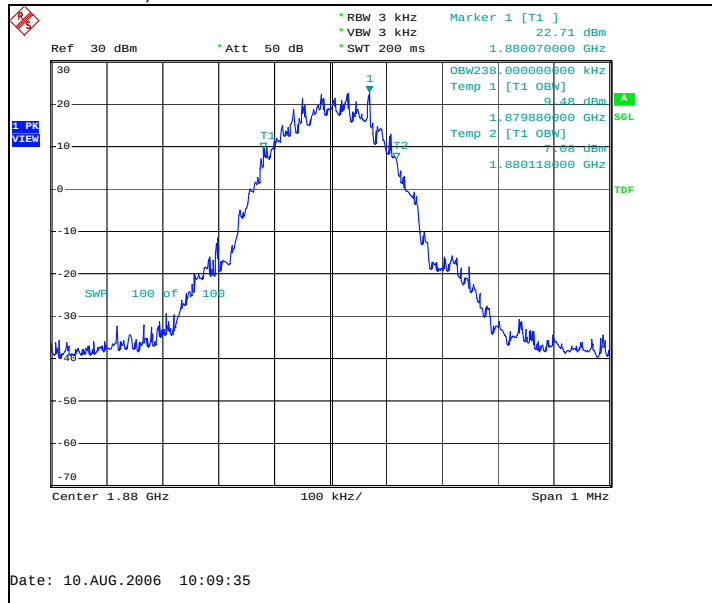
### 2.2. Test method and limit

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

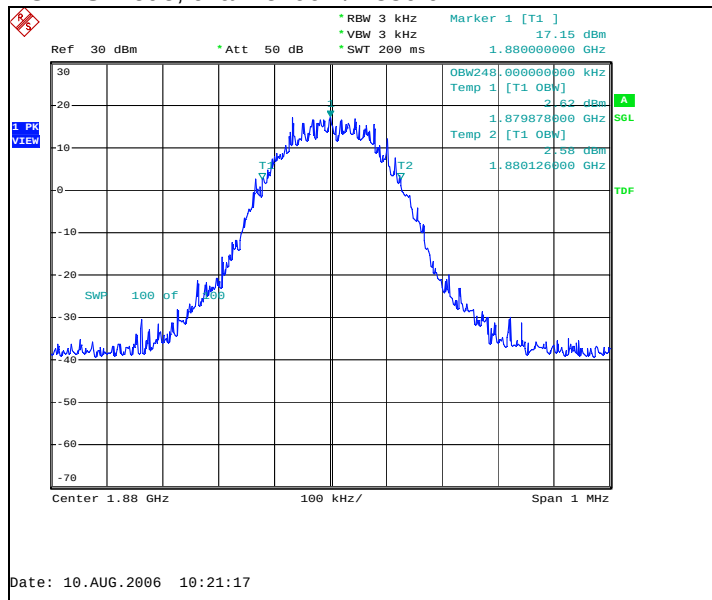
## 2.3. GSM 1900 Test results

| Operation mode (TX on) | 99% occupied bandwidth [kHz] |
|------------------------|------------------------------|
| GSM                    | 242                          |
| EGPRS                  | 248                          |

GSM mode, channel 661 / 1880.0 MHz



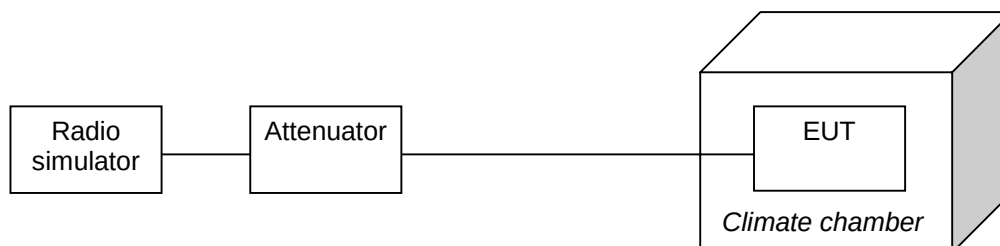
EGPRS mode, channel 661 / 1880.0 MHz



### 3. Frequency stability, temperature variation (FCC §2.1055(a), §2.1055(a), RSS-GEN 4.5, RSS-132 4.3, RSS-133 7)

|                                                         |                                   |
|---------------------------------------------------------|-----------------------------------|
| <b>EUT with DUT number</b>                              | RM-140 dut 27864, BP-5L dut 27865 |
| <b>Accessories with DUT numbers</b>                     | HS-60 dut 27866, AC-3E dut 27860  |
| <b>Operation Voltage [V] / [Hz]</b>                     | 230 / 50                          |
| <b>Result</b>                                           | Passed                            |
| <b>Remarks</b>                                          | None                              |
| <b>Temp [°C] / Humidity [%RH] / Air Pressure [mBar]</b> | 25.3 / 44.0<br>1011.5             |
| <b>Date of measurements</b>                             | 10-08-2006                        |
| <b>Measured by</b>                                      | Jan Engelbrechtsen                |

#### 3.1. Test setup



#### 3.2. Test method and limit

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

- The climate chamber temperature is set to the maximum value and the temperature is allowed to stabilize.
- The EUT is placed in the chamber.
- The EUT is set in idle mode for 15 minutes.
- The EUT is set to transmit.
- The transmit frequency error was measured immediately.
- The steps c - e were repeated for each temperature.

Limits for frequency stability, temperature variation measurements

| <b>Frequency deviation [ppm]</b> |
|----------------------------------|
| $\pm 2.5$                        |

### 3.3. GSM 1900 Test results

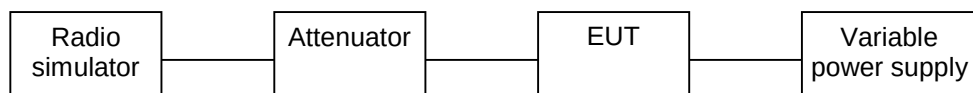
GSM mode, channel 661 / 1880.0 MHz

| Temperature [°C] | Deviation [Hz] | Deviation [ppm] |
|------------------|----------------|-----------------|
| 50               | -67            | -0.0356         |
| 40               | -69            | -0.0367         |
| 30               | -60            | -0.0319         |
| 20               | -81            | -0.0431         |
| 10               | -69            | -0.0367         |
| 0                | -68            | -0.0362         |
| -10              | -72            | -0.0383         |
| -20              | -74            | -0.0394         |
| -30              | -74            | -0.0394         |

#### 4. Frequency stability, voltage variation (FCC §2.1055(d), RSS-GEN 4.5, RSS-132 4.3, RSS-133 7)

|                                                             |                                |
|-------------------------------------------------------------|--------------------------------|
| <b>EUT with DUT number</b>                                  | RM-140 dut 27864               |
| <b>Accessories with DUT numbers</b>                         | HS-60 dut 27866                |
| <b>Operation Voltage [V] / [Hz]</b>                         | Dummy battery, DC Power Supply |
| <b>Result</b>                                               | Passed                         |
| <b>Remarks</b>                                              | None                           |
| <b>Temp [°C] / Humidity [%RH] /<br/>Air Pressure [mBar]</b> | 25.3 / 44.0<br>1011.5          |
| <b>Date of measurements</b>                                 | 10-08-2006                     |
| <b>Measured by</b>                                          | Jan Engelbrechtsen             |

##### 4.1. Test setup



##### 4.2. Test method and limit

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

The EUT battery was replaced with an adjustable power supply. The frequency stability was measured at nominal voltage and at the battery cut-off point.

Limits for frequency stability, voltage variation measurements

| <b>Frequency deviation [ppm]</b> |
|----------------------------------|
| $\pm 2.5$                        |



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#### 4.3. GSM 1900 Test results

GSM mode, channel 661 / 1880.0 MHz

| Voltage level [V]            | Deviation [Hz] | Deviation [ppm] |
|------------------------------|----------------|-----------------|
| Battery cut-off point / 3.30 | -52            | -0.0277         |
| Nominal / 3.90               | -70            | -0.0372         |

## 5. Test Equipment

### 5.1. Conducted measurements

| Eq. No | Equipment                                      | Type      | Manufacturer         | Used in |
|--------|------------------------------------------------|-----------|----------------------|---------|
| 13037  | Power Supply 0-15V 10A                         | EA3012    | LP Instruments       | 15B,15C |
| 13513  | Pulse Limiter 9KHz-30MHz                       | ESH3Z2    | Rohde&Schwarz        | 15B,15C |
| 13666  | EMI Test Reciever 9KHz-2,5GHz                  | ESPC      | Rohde&Schwarz        | 15B,15C |
| 13935  | Two Lines Artificial Mains Network             | ESH3-Z5   | Rohde&Schwarz        | 15B,15C |
| 16995  | Directional Coupler 20dB 0,5-2,0 GHz SMA Conn. | 1538RA-20 | Weinschel            | 15B,15C |
| 18772  | Shielded Chamber                               | RFD-100   | ETS-Lindgren         | 15B,15C |
| 19171  | Universal Radio Communication Tester           | CMU200    | Rohde&Schwarz        | 15B,15C |
| 11386  | System DC Power Supply                         | HP6632A   | Hewlett Packard      | 22.24   |
| 11487  | Network analyzer 300KHz-3,0GHz                 | HP8753A   | Hewlett Packard      | 22.24   |
| 11584  | Spectrum analyzer 50Hz-6,5GHz                  | HP8561B   | Hewlett Packard      | 22.24   |
| 13134  | Tracking generator                             | HP85645A  | Hewlett Packard      | 22.24   |
| 13302  | Spectrum Analyzer 9KHz-12.8GHz                 | HP8596E   | Hewlett Packard      | 22.24   |
| 13371  | Temperature Chamber                            | S-1,2C    | Thermotron           | 22.24   |
| 13524  | Digital Radiocomm. Tester                      | CMD55     | Rohde&Schwarz        | 22.24   |
| 14807  | S - Parameter Test Set 300KHz-6GHz             | HP85047A  | Hewlett Packard      | 22.24   |
| 15859  | Digital Radio Communication Test Set           | 4201S     | Wavetek              | 22.24   |
| 17277  | Multimeter Digital 6 1/2 Digit                 | AT34401A  | Agilent Technologies | 22.24   |
| 17796  | Radio Communication Test Set                   | 4400M     | Wavetek              | 22.24   |
| 19374  | Resonant Dipole Antenna 850MHz SMA m Conn.     | -         | NMP Cph              | 22.24   |
| 19375  | Resonant Dipole Antenna 1900MHz SMA m Conn.    | -         | NMP Cph              | 22.24   |
| 13037  | Power Supply 0-15V 10A                         | EA3012    | LP Instruments       | 15B,15C |

### 5.2. Radiated measurements

| Eq. No | Equipment                                   | Type           | Manufacturer  | Used in       |
|--------|---------------------------------------------|----------------|---------------|---------------|
| 14020  | Programmable Relay Switching System         | -              | Pickering     | 15B,15C,22,24 |
| 18792  | Multi Device Controller                     | 2090           | ETS-EMCO      | 15B,15C,22,24 |
| 13829  | Turntable Controller                        | 4630-100       | Comtest       | 15B,15C,22,24 |
| 14963  | RF Preamplifier 100MHz-4GHz (Metal Chassis) | AFS3-00100400  | Miteq/NMP Cph | 15B,15C,22,24 |
| 13668  | BiLog Antenna 30-2000MHz                    | BiLog-CBL6112A | Chase         | 15B,15C,22,24 |
| 18861  | EMI Test Receiver 20Hz-26,5GHz              | ESI            | Rohde&Schwarz | 15B,15C,22,24 |
| 12679  | Dual Log Periodic Antenna 1-18 GHz          | HL025          | Rohde&Schwarz | 15B,15C,22,24 |
| 18860  | Ultra Broadband Antenna                     | HL562          | Rohde&Schwarz | 15B,15C,22,24 |

| Eq. No | Equipment                                   | Type                           | Manufacturer           | Used in       |
|--------|---------------------------------------------|--------------------------------|------------------------|---------------|
|        | Ultralog 30-3000MHz                         |                                |                        |               |
| 18773  | Shielded Chamber                            | RFD-100                        | ETS-Lindgren           | 15B,15C,22,24 |
| 18774  | Shielded Chamber                            | RFSD-F/A-100                   | ETS-Lindgren           | 15B,15C,22,24 |
| 18324  | High Pass Filter 3GHz SMA f Conn            | WHJS3000-10SS                  | Wainwright             | 15B,15C,22,24 |
| 14114  | Highpass Filter 1000MHz-4500MHz             | WHK1000-12SS                   | Wainwright             | 15B,15C,22,24 |
| 13918  | Highpass Filter 2000-4000MHz 50OHM SMA Conn | WHKS2000-10SS                  | Wainwright Instruments | 15B,15C,22,24 |
| 13937  | Ultra Stable Notch Filter 902,4MHz          | WRCA902.4-0.2/40-6SS           | Wainwright Instruments | 15B,15C,22,24 |
| 13936  | Ultra Stable Notch Filter 1747,5MHz         | WRCD1747.5-0.2/40-10SS         | Wainwright Instruments | 15B,15C,22,24 |
| 13917  | Highpass Filter 1000-3000MHz 50OHM SMA Conn | WHKS1000-10SS                  | Wainwright Instruments | 15B,15C,22,24 |
| 14188  | Ultra Stable Notch Filter 902,4MHz          | WRCA902.4-0.2/40-6SS           | Wainwright             | 15B,15C,22,24 |
| 14187  | Ultra Stable Notch Filter 1747,5MHz         | WRCD1747.5-0.2/40-10SS         | Wainwright             | 15B,15C,22,24 |
| 16633  | Ultra Stable Notch Filter 1880,0MHz         | WRCD1880.0-0.2/40-10SS         | Wainwright             | 15B,15C,22,24 |
| 18323  | Band reject filter 1947-1953MHz 40dB        | WRCG1947/1953-1940/1960-40/6SS | Wainwright             | 15B,15C,22,24 |
| 15190  | Infra Red Remote Control Unit               | 4630                           | Emco                   | 22,24,15B,15C |
| 14993  | EMI Test Receiver 9KHz-2750MHz              | ESCS30                         | Rohde&Schwarz          | 22,24,15B,15C |
| 15191  | Turntable Contoller Unit                    | G-800SDX                       | YAESU                  | 22,24,15B,15C |
| 14900  | Antenna Controller                          | HD100                          | HD GmbH                | 22,24,15B,15C |