



Test &amp; Certification Center (TCC) - Dallas

FCC ID: GMLRH-41

Test Report #: 03-EM-0142.002

August 28, 2003

Accredited Laboratory  
Certificate Number: 1819-01

Ver 1.0

## CFR 47 Part 2, 22, and 24 Test Report

Test Report Number: 03-EM-0142.002

**Terminal device:**FCC ID: GMLRH-41, Model: 2260, Type: RH-41, HW: 1170f, 1171f, 1150f SW: 3.02  
(Detailed information is listed in section 4).

Originator: Mark Severson  
Function: TCC - Dallas – EMC  
Version/Status: 1.0 Approved  
Location: TCC Directories  
Date: August 28, 2003

**Change History:**

| Version | Date         | Status   | Handled By    | Comments |
|---------|--------------|----------|---------------|----------|
| 0.1     | Aug 25, 2003 | Draft    | Mark Severson | Draft    |
| 0.2     | Aug 28, 2003 | Reviewed | M.Mobley      | Reviewed |
| 1.0     | Aug 28, 2003 | Approved | Alan Ewing    | Approved |

**Testing laboratory:**

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Nokia Mobile Phones, Inc  
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Irving, Texas 75039  
U.S.A.  
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**Client:**

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Nokia Mobile Phones  
Model 2260, FCC ID: GMLRH-41  
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FIN-90570 OULU  
FINLAND  
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**Date and signatures:**

August 28, 2003

For the contents:

Nerina Walton, EMC Engineer  
Technical Review

Alan C. Ewing, General Manager  
Manager Review

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## 1. GENERAL

### 1.1 Quality System

The quality system in place for TCC-Dallas conforms to ISO/IEC 17025 and has been audited to the standard by A2LA (American Association of Laboratory Accreditation). The appendix of this report contains the scope of accreditation for A2LA. TCC – Dallas has also been audited using the ISO 9000 Quality System, as part of Nokia Mobile Phones, Inc., by ABS (American Bureau of Shipping) Quality Evaluations Inc.

TCC-Dallas is a recognized laboratory with the Federal Communications Commission in filing applications for Certification under Parts 15 and 18, Registration Number 100060, and Industry Canada, Registration Number IC 661.

### 1.2 List of General Information Required for Certification

*This list is in accordance with FCC Rules and Regulations, CFR 47, Part 2, and to 22H, 24E Confidentiality.*

#### 1.2.1 Sub-part 2.1033(c)(1)

**Name and Address of Applicant:** Nokia Corporation  
Nokia Mobile Phones  
Elektroniikkatie 10  
FIN-90570 OULU  
FINLAND

**Manufacturer:** Nokia Brazil Manaus AM  
Rod. Torquato Tapajós, 7200 KM 12 - Tarumã  
Postal code: 69048-660  
Manaus, Amazonas, Brazil

Nokia Mexico, S.A. DE C.V.  
Ave. Ind. Rio Bravo s/n, Parque Ind. del Nte.  
Cd. Reynosa, Tam. CP, 88730

Nokia TMC Ltd  
973-6 Yangduck-Dong  
Hwe won-ku, Masan  
**Korea**

#### 1.2.2 Sub-part 2.1033(c)(2)

**FCC ID:** GMLRH-41

**Model No:** 2260

#### 1.2.3 Sub-part 2.1033(c)(3)

**Instruction Manual(s):**  
Refer to attached EXHIBITS

#### 1.2.4 Sub-part 2.1033(c)(4)

**Type of Emission:** 40K0F1D, 40K0F8W, 30K0DXW

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## 1.2.5 Sub-part 2.1033(c)(5)

Frequency Range, MHz: 824.04 to 848.97  
1850.04 to 1909.92

## 1.2.6 Sub-part 2.1033(c)(6)

Power Rating, Watts: 0.219 ERDP AMPS  
0.479 ERDP Cellular Band - TDMA  
1.122 EIRP PCS Band - TDMA

☐ Switchable ☒ Variable ☐ N/A

FCC Grant Note: BC- The output power is continuously variable from the value listed in this entry to 5%-10% of the value listed.

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## 1.2.7 Sub-part 2.1033(c)(7)

Maximum Power Rating, Watts: 1.122

## 1.2.8 Sub-part 2.1033(c)(8)

Voltages & Currents in all elements in final R.F. Stage, including final transistor or solid-state device:

Collector Current, A = 312mA

Collector Voltage, Vdc = 3.6

Supply Voltage, Vdc = 3.6

## 1.2.9 Sub-part 2.1033(c)(9)

Tune-up Procedure:

Refer to attached EXHIBITS

## 1.2.10 Sub-part 2.1033(c)(10)

Circuit Diagram/Circuit Description:

Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

Refer to attached EXHIBITS

## 1.2.11 Sub-part 2.1033(c)(11)

Label Information:

Refer to attached EXHIBITS

## 1.2.12 Sub-part 2.1033(c)(12)

Photographs:

Refer to attached EXHIBITS

## 1.2.13 Sub-part 2.1033(c)(13)

Digital Modulation Description:

N/A

## 1.2.14 Sub-part 2.1033(c)(14)

Test and Measurement Data:

FOLLOWS

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## 1.3 Objective

All tests and measurement data shown was performed to determine whether the selected handset was in compliance as specified in FCC: CFR47 Parts 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, Part 22, and Part 24.

## 1.4 Test Summary

**Test Results:** *The test result relates only to those tested devices mentioned in Section 4 of this test report.*

| Test Performed                                         | Reference                           | Section of Report | Complies / Does not comply |
|--------------------------------------------------------|-------------------------------------|-------------------|----------------------------|
| RF Power Output (Radiated)                             | FCC Part 22.913(a) / 24.232(b)      | 6                 | Not Tested                 |
| Occupied Bandwidth: Transmitter Conducted Measurements | FCC Part 2.1049(c)(1), 24.238(a)(b) | 7                 | Not Tested                 |
| Spurious Emissions at Antenna Terminals                | FCC Part 2.1051                     | 8                 | Not Tested                 |
| Field Strength of Spurious Radiation                   | FCC Part 2.1053                     | 9                 | Complies                   |
| Frequency Stability (Temperature Variation)            | FCC Part 2.1055(a)(1)(b), 24.235    | 10                | Not Tested                 |
| Frequency Stability (Voltage Variation)                | FCC Part 2.1055(d)(1)(2), 24.235    | 11                | Not Tested                 |

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## 2. STANDARDS BASIS

*Testing has been carried out in accordance with:*

| REF. | Code of the standard | Name of the standard                                                                                                                                                               |
|------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | ANSI C63.4           | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.                 |
| 2    | FCC: CFR 47 Part 2   | Code of Federal Regulations (CFR) Title 47, Part 2 – Frequency Allocations and Radio Treaty Matters; General Rules and Regulations: Subpart J – Equipment Authorization Procedures |
| 3    | FCC: CFR 47 Part 22  | Code of Federal Regulations (CFR) Title 47, Part 22 – Public Mobile Services: Subpart H – Cellular Radiotelephone Service                                                          |
| 4    | FCC: CFR 47 Part 24  | Code of Federal Regulations (CFR) Title 47, Part 24 – Personal Communications Services: Subpart E – Broadband PCS                                                                  |
| 5    | RSS-132              | 800 MHz Cellular Telephones Employing New Technologies                                                                                                                             |
| 6    | RSS-133              | 2 GHz Personal Communications Services, Industry Canada                                                                                                                            |
| 7    | RSS-212              | Test Facilities and Test Methods for Radio Equipment, Industry Canada (Provisional)                                                                                                |
| 8    | RSP-100              | Radio Equipment Certification Procedure                                                                                                                                            |

Note: Unless otherwise stated, (by reference to a version number and a publication date), the latest version of the above documents applies.

### ***Deviations:***

Not Applicable.

### 3. LIST OF ABBREVIATIONS, ACRONYMS AND TERMS

#### 3.1 Abbreviations

dB - decibel

dBm - decibels per milliwatt (absolute measurement)

GHz - gigahertz or 1000000000 hertz

kHz - kilohertz or 1000 hertz

MHz - megahertz or 1000000 hertz

#### 3.2 Acronyms

AMPS - Advanced Mobile Phone System

BSS - Base Station Simulator

CDMA - Code Division Multiple Access

EDRP - Effective Dipole Radiated Power

EIRP - Effective Isotropic Radiated Power

EMC - Electromagnetic Compatibility

EMI - Electromagnetic Interference

ERP - Effective Radiated Power

EUT - Equipment under Test

GSM - Global System for Mobile communications

PCS - Personal Communications Services

RF - Radio Frequency

TDMA - Time Division Multiple Access

#### 3.3 Terms

Base Station Simulator (BSS) - simulates all the necessary signals that a phone would experience while on a live network. There are many types of base station simulators catering for all current protocols, i.e., GSM, AMPS, TDMA, and CDMA.

Cellular - refers to a frequency in the 800MHz band.

PCS - refers to a frequency in the 1900MHz band.

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## 4. EQUIPMENT-UNDER-TEST (EUT)

*The results in this report relate only to the items listed below:*

### 4.1 Description of Tested Device(s):

| Test Performed                                                                                                                 | Mode of Operation     | Date of Receipt | Condition of Sample | Item  | Identifying Information                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------|---------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1053, 22.913(a), 24.232(b)(c)                                                                                                | AMPS TDMA<br>800/1900 | 23-June-2003    | Good                | Phone | FCC ID: GMLRH-41<br>Type: RH-41<br>HW: 1170f<br>SW: 3.02<br>ESN: 07201965959<br><br>HW: 1171f<br>SW: 3.02<br>ESN: 07201965869<br><br>HWI: 1150f<br>SW: 3.02<br>ESN: 07201966044 |
| 2.1049(c)(1), 2.1051, 2.1055(d)(1)(2),<br>2.1055(a)(1)(b), 22.917, 24.235,<br>24.238(a)(b)                                     | N/A                   | N/A             | N/A                 | N/A   | Not Tested                                                                                                                                                                      |
| 2.1049(c)(1), 2.1051, 2.1053,<br>2.1055(d)(1)(2), 2.1055(a)(1)(b),<br>22.913(a), 22.917, 24.232(b)(c),<br>24.235, 24.238(a)(b) | N/A                   | N/A             | N/A                 | N/A   | Not Tested                                                                                                                                                                      |

### 4.2 Photograph of Tested Device(s):

Refer to attached EXHIBITS

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## 5. TEST EQUIPMENT LIST

The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items listed can be obtained from the Engineering Services Group within NMP, Product Creation - Dallas. Where relevant, measuring equipment is subjected to in-service checks between testing. TCC - Dallas shall notify clients promptly, in writing, of identification of defective measuring equipment that casts doubt on the validity of results given in this report.

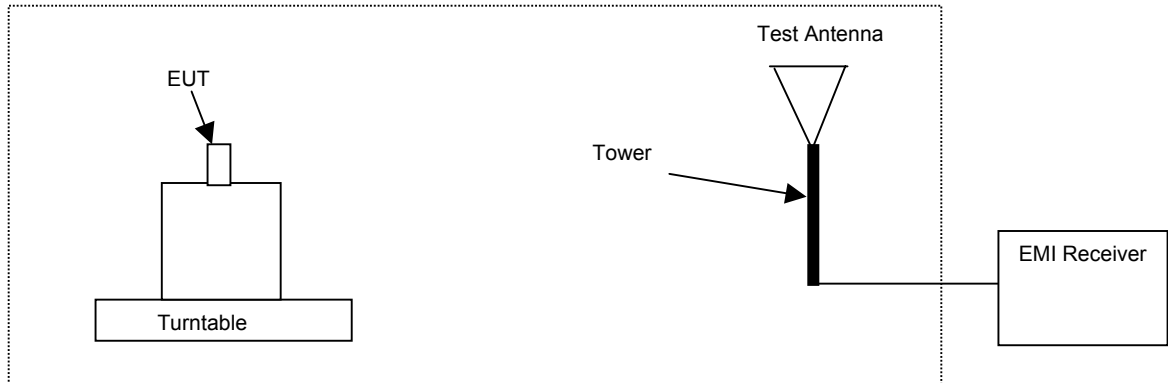
| Nemko ID | Description            | Manufacturer Model Number | Serial Number | Calibration Date | Calibration Due |
|----------|------------------------|---------------------------|---------------|------------------|-----------------|
| 993      | Horn antenna           | A.H. Systems SAS-200/571  | XXX           | Jan-02           | Jan-04          |
| 1484     | Cable 2.0-18.0 Ghz     | Storm PR90-010-072        | N/A           | Jul-03           | Jul-04          |
| 1485     | Cable 2.0-18.0 Ghz     | Storm PR90-010-216        | N/A           | Jul-03           | Jul-04          |
| 1464     | Cable 2.0-16.0 Ghz     | Storm PR90-010-072        | N/A           | Jul-03           | Jul-04          |
| 1483     | Cable 4m               | Storm PR90-10-0144        | N/A           | Apr-03           | Apr-04          |
| 1016     | Preamplifier           | Hewlett Packard 8449A     | 2749A00159    | Jul-03           | Jul-04          |
| Nokia ID | Base Station Simulator | Wavetek                   | N/A           | Nov-03           | Jul-04          |

| Test Equipment                                     | NMP # | Test Performed                        |
|----------------------------------------------------|-------|---------------------------------------|
| Base Station Simulator (Wavetek 4200)              | 02281 | Call Mode Spurious Radiated Emissions |
| Biconilog Antenna (3142b)                          | 01472 | Call Mode Spurious Radiated Emissions |
| EMI Receiver (HP8546A)                             | 02664 | Call Mode Spurious Radiated Emissions |
| EMI Receiver (HP85460A)                            | 02665 | Call Mode Spurious Radiated Emissions |
| EMI Receiver (E7405A)                              | 02679 | Call Mode Spurious Radiated Emissions |
| Pre-Amplifier (HP8449B)                            | 00001 | Call Mode Spurious Radiated Emissions |
| Horn Antenna (3115)                                | 02857 | Call Mode Spurious Radiated Emissions |
| Horn Antenna (3115 for final measurements)         | 00064 | Call Mode Spurious Radiated Emissions |
| Signal Generator (83630B - for final measurements) | 02671 | Call Mode Spurious Radiated Emissions |
| Turntable and Tower Controller                     | 02846 | Call Mode Spurious Radiated Emissions |
| Weinschel Attenuator (10dB)                        | None  | Call Mode Spurious Radiated Emissions |

## 6. RF POWER OUTPUT (RADIATED)

*Specification: FCC Part 22.913(a), 24.232(b)(c)*

### 6.1 Setup



### 6.2 Pass/Fail Criteria

| Band     | FCC Limit (dBm) |
|----------|-----------------|
| Cellular | 38.5 (EDRP)     |
| PCS      | 33.0 (EIRP)     |

### 6.3 Detailed Test Results

**Test Not Performed**

### 6.4 Measurement Uncertainty

The measurement uncertainty for this test is +/- 2.4dB for 800 to 2000 MHz.

## 7. OCCUPIED BANDWIDTH (TRANSMITTER CONDUCTED MEASUREMENTS)

*Specification: FCC Part 2.1049(c)(1), 24.238(a)(b)*

### 7.1 Setup

Testing was performed with the EUT connected to a 6dB attenuator, 6dB splitter, filter bank and then to the EMI receiver. The base station simulator was connected to the other port of the splitter to establish a call.

### 7.2 Pass/Fail Criteria

| Band                      | Frequency Range (MHz) | FCC Limits (dBm) |
|---------------------------|-----------------------|------------------|
| Cellular 800 Low Channel  | < 824                 | -13              |
| Cellular 800 High Channel | > 849                 | -13              |
| PCS 1900 Low Channel      | < 1850                | -13              |
| PCS 1900 High Channel     | > 1910                | -13              |

### 7.3 Detailed Test Results

**Test Not Performed**

### 7.4 Measurement Uncertainty

The measurement uncertainty for this test is +/- 3.7dB for 100kHz - 1000MHz and +/- 5.3dB for 1 - 20GHz.

## 8. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

*Specification: FCC Part 2.1051*

### 8.1 Setup

Testing was performed with the EUT connected to a 6dB attenuator, 6dB splitter, filter bank and then to the EMI receiver. The base station simulator was connected to the other port of the splitter to establish a call. Filters were introduced to reduce or eliminate spurious emission, which could be generated internally in the EMI receiver.

### 8.2 Pass/Fail Criteria

| Band           | Frequency Range (MHz) | FCC Limits (dBm) |
|----------------|-----------------------|------------------|
| Cellular / PCS | 30 – 20000 *          | -13              |

\* Frequency to be investigated up to the 10<sup>th</sup> harmonic of the highest clock or frequency used.

### 8.3 Detailed Test Results

**Test Not Performed**

### 8.4 Measurement Uncertainty

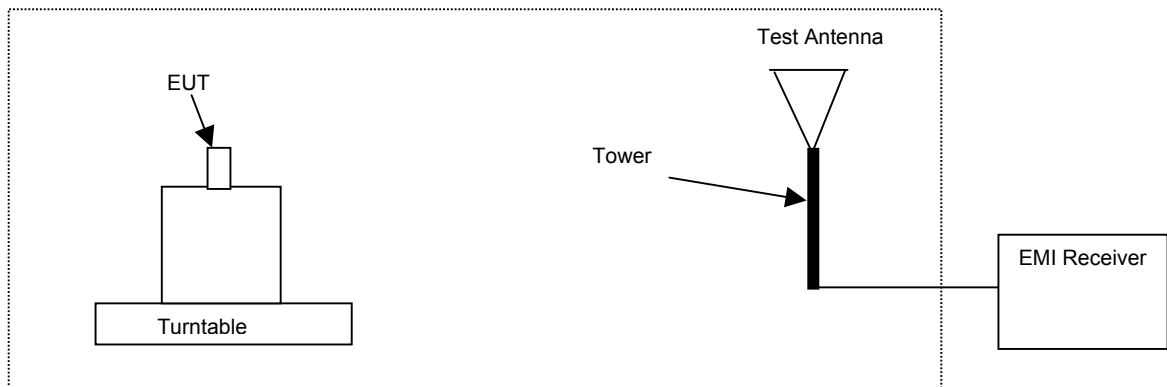
The measurement uncertainty for this test is +/- 3.7dB for 100kHz - 1000MHz and +/- 5.3dB for 1 - 20GHz.

## 9. FIELD STRENGTH OF SPURIOUS RADIATION

**Specification: FCC Part 2.1053**

### 9.1 Setup

Test equipment set-up.



### 9.2 Pass/Fail Criteria

| Band           | Frequency Range (MHz) | FCC Limit (dBm) |
|----------------|-----------------------|-----------------|
| Cellular / PCS | 30 – 20000*           | -13             |

- Frequency to be investigated up to the 10<sup>th</sup> harmonic of the highest clock or frequency used.

Substitution method according to ANSI/TIA/EIA 603-1 was used for final measurements.

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## 9.3 Detailed Test Results

|                            |                               |       |
|----------------------------|-------------------------------|-------|
| Test Technician / Engineer | Nemko Dallas                  |       |
| Date of Measurement        | August 12, 2003               |       |
| Temperature / Humidity     | 22°C                          | 56%RH |
| Test Result                | Complies with FCC Part 2.1053 |       |

### Cellular Band, AMPS 836.52 MHz, Channel 384

| Frequency<br>(MHz) | Meter<br>Reading<br>(dBm) | Correction<br>Factor<br>(dB) | Pre-Amp<br>Gain<br>(dB) | Substitution<br>Antenna Gain<br>(dBd) | Limit<br>(dBm) | ERP<br>(dBm) | ERP<br>(mW) | Polarity | Comments<br><br>Amps |
|--------------------|---------------------------|------------------------------|-------------------------|---------------------------------------|----------------|--------------|-------------|----------|----------------------|
| 1673.04            | -72.3                     | 31.0                         | 0                       | 7.3                                   | -13            | -34.1        | 0.0004      | V        |                      |
| 2509.56            | -58.3                     | 35.5                         | 33                      | 8.0                                   | -13            | -47.9        | 0.0000      | V        |                      |
| 3346.08            | -75.3                     | 39.8                         | 32.7                    | 8.0                                   | -13            | -60.2        | 0.0000      | V        |                      |
| 4182.60            | -72.3                     | 45.3                         | 33.2                    | 8.2                                   | -13            | -52.0        | 0.0000      | V        |                      |
| 5019.12            | -77.3                     | 41.3                         | 32.7                    | 8.2                                   | -13            | -60.5        | 0.0000      | V        |                      |
| 5855.64            | -81.3                     | 39.8                         | 31.8                    | 9.3                                   | -13            | -64.0        | 0.0000      | V        | Noise floor          |
| 6692.16            | -79.7                     | 41.3                         | 31.6                    | 9.4                                   | -13            | -60.6        | 0.0000      | V        | Noise floor          |
| 7528.68            | -81.2                     | 41.8                         | 32.5                    | 9.2                                   | -13            | -62.7        | 0.0000      | V        | Noise floor          |
| 8365.20            | -80.0                     | 42.8                         | 33.4                    | 9.1                                   | -13            | -61.5        | 0.0000      | V        | Noise floor          |
| 1673.04            | -81.0                     | 33.0                         | 0                       | 7.3                                   | -13            | -40.8        | 0.0001      | H        |                      |
| 2509.56            | -55.2                     | 35.5                         | 33                      | 8.0                                   | -13            | -44.8        | 0.0000      | H        |                      |
| 3346.08            | -73.5                     | 36.3                         | 32.7                    | 8.0                                   | -13            | -61.9        | 0.0000      | H        |                      |
| 4182.60            | -72.7                     | 34.8                         | 33.2                    | 8.2                                   | -13            | -62.9        | 0.0000      | H        |                      |
| 5019.12            | -79.5                     | 38.3                         | 32.7                    | 8.2                                   | -13            | -65.7        | 0.0000      | H        | Noise floor          |
| 5855.64            | -80.3                     | 37.8                         | 31.8                    | 9.3                                   | -13            | -65.0        | 0.0000      | H        | Noise floor          |
| 6692.16            | -80.8                     | 39.2                         | 31.6                    | 9.4                                   | -13            | -63.9        | 0.0000      | H        | Noise floor          |
| 7528.68            | -81.8                     | 41.5                         | 32.5                    | 9.2                                   | -13            | -63.7        | 0.0000      | H        | Noise floor          |
| 8365.20            | -80.8                     | 42.5                         | 33.4                    | 9.1                                   | -13            | -62.6        | 0.0000      | H        | Noise floor          |

Notes:



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## Cellular Band, TDMA 800, Channel 384

| Frequency<br>(MHz) | Meter<br>Reading<br>(dBm) | Correction<br>Factor<br>(dB) | Pre-Amp<br>Gain<br>(dB) | Substitution<br>Antenna Gain<br>(dBd) | Limit<br>(dBm) | ERP<br>(dBm) | ERP<br>(mW) | Polarity | Comments<br><br>TDMA |
|--------------------|---------------------------|------------------------------|-------------------------|---------------------------------------|----------------|--------------|-------------|----------|----------------------|
| 1673.04            | -66.3                     | 31.0                         | 0                       | 7.3                                   | -13            | -28.1        | 0.0016      | V        |                      |
| 2509.56            | -51.8                     | 35.5                         | 33                      | 8.0                                   | -13            | -41.4        | 0.0001      | V        |                      |
| 3346.08            | -69.3                     | 39.8                         | 32.7                    | 8.0                                   | -13            | -54.2        | 0.0000      | V        |                      |
| 4182.60            | -67.0                     | 45.3                         | 33.2                    | 8.2                                   | -13            | -46.7        | 0.0000      | V        |                      |
| 5019.12            | -73.2                     | 41.3                         | 32.7                    | 8.2                                   | -13            | -56.4        | 0.0000      | V        |                      |
| 5855.64            | -77.7                     | 39.8                         | 31.8                    | 9.3                                   | -13            | -60.4        | 0.0000      | V        |                      |
| 6692.16            | -80.3                     | 41.3                         | 31.6                    | 9.4                                   | -13            | -61.2        | 0.0000      | V        | Noise floor          |
| 7528.68            | -81.3                     | 41.8                         | 32.5                    | 9.2                                   | -13            | -62.8        | 0.0000      | V        | Noise floor          |
| 8365.20            | -80.2                     | 42.8                         | 33.4                    | 9.1                                   | -13            | -61.7        | 0.0000      | V        | Noise floor          |
|                    |                           |                              |                         |                                       |                |              |             |          |                      |
| 1673.04            | -79.8                     | 33.0                         | 0                       | 7.3                                   | -13            | -39.6        | 0.0001      | H        |                      |
| 2509.56            | -48.2                     | 35.5                         | 33                      | 8.0                                   | -13            | -37.8        | 0.0002      | H        |                      |
| 3346.08            | -70.0                     | 36.3                         | 32.7                    | 8.0                                   | -13            | -58.4        | 0.0000      | H        |                      |
| 4182.60            | -65.5                     | 34.8                         | 33.2                    | 8.2                                   | -13            | -55.7        | 0.0000      | H        |                      |
| 5019.12            | -76.5                     | 38.3                         | 32.7                    | 8.2                                   | -13            | -62.7        | 0.0000      | H        |                      |
| 5855.64            | -76.3                     | 37.8                         | 31.8                    | 9.3                                   | -13            | -61.0        | 0.0000      | H        |                      |
| 6692.16            | -79.2                     | 39.2                         | 31.6                    | 9.4                                   | -13            | -62.3        | 0.0000      | H        |                      |
| 7528.68            | -80.7                     | 41.5                         | 32.5                    | 9.2                                   | -13            | -62.6        | 0.0000      | H        | Noise floor          |
| 8365.20            | -77.7                     | 42.5                         | 33.4                    | 9.1                                   | -13            | -59.5        | 0.0000      | H        |                      |
|                    |                           |                              |                         |                                       |                |              |             |          |                      |
|                    |                           |                              |                         |                                       |                |              |             |          |                      |

Notes:

Test & Certification Center (TCC) - Dallas  
 FCC ID: GMLRH-41  
 Test Report #: 03-RF-0142.002  
 August 28, 2003

Ver 1.0

PCS Band, TDMA 1900, Channel 999

|                                   |                          |              |
|-----------------------------------|--------------------------|--------------|
| <b>Test Technician / Engineer</b> | J. Love,                 |              |
| <b>Date of Measurement</b>        | 12-Aug-03 to - 13Aug-03  |              |
| <b>Temperature / Humidity</b>     | 23 to 24 °C              | 38 to 54 %RH |
| <b>Test Result</b>                | Complies with FCC 2.1053 |              |

| Tuned Frequency (MHz) | Frequency Max (MHz) | PK EMI (dBm) Horizontal | PK EMI (dBm) Vertical | FCC Limit (dBm) |
|-----------------------|---------------------|-------------------------|-----------------------|-----------------|
| 1880                  | 3760                | -29                     | -24.1                 | -13             |
| 1880                  | 5640                | -23                     | -21                   | -13             |
| 1880                  | 7520                | -37                     | -21                   | -13             |
| 1880                  | 9400                | -35                     | -36                   | -13             |
| 1880                  | 11280               | -34                     | -34                   | -13             |
| 1880                  | 13160               | -30                     | -33                   | -13             |
| 1880                  | 15040               | -35                     | -34                   | -13             |
| 1880                  | 16920               | -29                     | -29                   | -13             |
| 1880                  | 18800               | -24                     | -24                   | -13             |

## 9.4 Measurement Uncertainty

The measurement uncertainty for this test is +/- 5.2dB for 30-300MHz; +/- 5.2dB for 300-1000MHz, +/- 5.6dB for 1-6GHz and +/-6.8 for 6-18GHz.

Test & Certification Center (TCC) - Dallas

FCC ID: GMLRH-41

Test Report #: 03-RF-0142.002

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Ver 1.0

## 10. FREQUENCY STABILITY (TEMPERATURE VARIATION)

*Specification: FCC Part 2.1055(a)(1)(b), 24.235*

### 10.1 Setup

The EUT was connected to the base station simulator to measure the RF power output.

### 10.2 Pass/Fail Criteria

Not Applicable

### 10.3 Detailed Test Results

**Test Not Performed**

Test & Certification Center (TCC) - Dallas

FCC ID: GMLRH-41

Test Report #: 03-RF-0142.002

August 28, 2003

Ver 1.0

## 11. FREQUENCY STABILITY (VOLTAGE VARIATION)

*Specification: FCC Part 2.1055(d)(1)(2), 24.235*

### 11.1 Setup

The EUT was connected to the base station simulator to measure the RF power output.

### 11.2 Pass/Fail Criteria

Not Applicable

### 11.3 Detailed Test Results

**Test Not Performed**

Test & Certification Center (TCC) - Dallas

FCC ID: GMLRH-41

Test Report #: 03-RF-0142.002

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Ver 1.0

## APPENDIX

TCC-Dallas is accredited by the American Association for Laboratory Accreditation (A2LA) as shown in the scope below:



Test & Certification Center (TCC) - Dallas

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|                                                                                                                                                                                                                                                                     |                                                                                                                                                                                         |                                                                 |                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>American Association for Laboratory Accreditation</b>                                                                                                                          |                                                                                                                                                                                         | <b>Tests</b><br>Wireless<br>GSM (850/900/1800/1900 MHz)<br>TDMA | <b>Test Method</b><br>3GPP TS 51.010-1, -2, -3<br>3GPP TS 11.10-4<br>PTCRB NAPRD.03<br>CTIA TDMA/AMPS Test Plan (excluding Sections 7.3.3 & 7.3.4)<br>TIA/EIA-136-270 |
| <b>SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999</b><br>NOKIA MOBILE PHONES<br>TEST & CERTIFICATION CENTER - DALLAS<br>6021 Connection Drive<br>Irving, TX 75039<br>Alan Ewing Phone: 972.894.4744                                                                   |                                                                                                                                                                                         |                                                                 |                                                                                                                                                                       |
| <b>ELECTRICAL</b>                                                                                                                                                                                                                                                   |                                                                                                                                                                                         |                                                                 |                                                                                                                                                                       |
| Valid to: November 30, 2003                                                                                                                                                                                                                                         |                                                                                                                                                                                         | Certificate Number: 1819-01                                     |                                                                                                                                                                       |
| In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following Electromagnetic Compatibility (EMC), Specific Absorption Rate (SAR), and tests on wireless communications devices: |                                                                                                                                                                                         |                                                                 |                                                                                                                                                                       |
| <b>Tests</b>                                                                                                                                                                                                                                                        | <b>Test Method</b>                                                                                                                                                                      |                                                                 |                                                                                                                                                                       |
| <i>Emissions</i>                                                                                                                                                                                                                                                    |                                                                                                                                                                                         |                                                                 |                                                                                                                                                                       |
| Conducted and Radiated                                                                                                                                                                                                                                              | CFR 47 Part 2, 15, 22, 24<br>CISPR 22; EN 55022<br>ICES-003; RSS-128, 132 and 133<br>3GPP TS 51.010-1 Section 12.2<br>ETSI EN 301 489-1; EN 301 489-7<br>(using ANSI C63.4 and RSS-212) |                                                                 |                                                                                                                                                                       |
| Specific Absorption Rate                                                                                                                                                                                                                                            | IEEE 1528<br>EN 50360; EN 50361<br>CFR 47 Parts 2 and 24<br>OET Bulletin 65 and Supplement C<br>RSS-102                                                                                 |                                                                 |                                                                                                                                                                       |
| <i>Immunity</i>                                                                                                                                                                                                                                                     |                                                                                                                                                                                         |                                                                 |                                                                                                                                                                       |
| Vehicular Immunity                                                                                                                                                                                                                                                  | ISO 7637-1; ETSI EN 301 489-1; EN 301 489-7                                                                                                                                             |                                                                 |                                                                                                                                                                       |
| Electrostatic Discharge (ESD)                                                                                                                                                                                                                                       | EN 61000-4-2; ETSI EN 301 489-1; EN 301 489-7                                                                                                                                           |                                                                 |                                                                                                                                                                       |
| RF Radiated                                                                                                                                                                                                                                                         | EN 61000-4-3; ETSI EN 301 489-1; EN 301 489-7                                                                                                                                           |                                                                 |                                                                                                                                                                       |
| Electrical Fast Transient/Burst                                                                                                                                                                                                                                     | EN 61000-4-4; ETSI EN 301 489-1; EN 301 489-7                                                                                                                                           |                                                                 |                                                                                                                                                                       |
| Surge                                                                                                                                                                                                                                                               | EN 61000-4-5; ETSI EN 301 489-1; EN 301 489-7                                                                                                                                           |                                                                 |                                                                                                                                                                       |
| Conducted                                                                                                                                                                                                                                                           | EN 61000-4-6; ETSI EN 301 489-1; EN 301 489-7                                                                                                                                           |                                                                 |                                                                                                                                                                       |
| Voltage Dips, Short Interruptions and Voltage Variations                                                                                                                                                                                                            | EN 61000-4-11; ETSI EN 301 489-1; EN 301 489-7                                                                                                                                          |                                                                 |                                                                                                                                                                       |
| (A2LA Cert. No. 1819.01) Revised 09/18/02<br>5301 Buckeystown Pike, Suite 350 • Frederick, MD 21704-8373 • Phone: 301-644 3248 • Fax: 301-662 2974                                                                                                                  |                                                                                                                                                                                         | (A2LA Cert. No. 1819.01) Revised 09/18/02                       |                                                                                                                                                                       |

"This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this report have been determined to be in accordance with the laboratory's terms of accreditation unless stated otherwise in the report."

Should this report contain any data for tests for which we are not accredited, such data would not be covered by this laboratory's A2LA accreditation.