

Test & Certification Center (TCC) - Dallas
DTX-1276-EN-2.0

Test Report #: WR-1079.103
23-Jun-06



Accredited Laboratory
Certificate Number: 1819-01

1 (15)

Ver 2.0

Bluetooth Test Report

Test Report Number: WR-1079.103

Terminal device: FCC ID: QMNRM-154 Model: 6275i Type: RM-154 HW: B2.0 SW: BL100b05.nep
(Detailed information is listed in section 4).

Originator: Viet Do
Function: TCC - Dallas – EMC
Version/Status: 2.0 Approved
Location: TCC Directories
Date: 23-Jun-06

Change History:

Version	Date	Status	Handled By	Comments
0.1	6-Jun-06	Draft	Viet Do	
0.2	6-Jun-06	Proposal	Viet Do	
0.3	6-Jun-06	Reviewed	Cindy Trinh	
1.0	6-Jun-06	Approved	Cindy Trinh	
2.0	23-Jun-06	Approved	Cindy Trinh	PCO requested to add Blue data to Black data

Testing laboratory:

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Date and signatures:**23-Jun-06**

For the contents:

Viet Do
Test Engineer

Cindy Trinh
Technical 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). 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 661N.

1.2 Objective

All tests and measurement data shown was performed to determine whether the selected handset was in compliance as specified in FCC: CFR47 Parts 15.207 and 15.247.

1.3 Test Summary

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

Test Performed	CFR 47	RSS-210	Section of Report	Complies / Does not comply / Not Tested
Radiated Emissions	15.247 (c)	6.2.2 (o), e1	7	Complies
AC Conducted Emissions	15.247	6.6	8	Complies



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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 15	Code of Federal Regulations (CFR) Title 47, Part 15 – Radio Frequency Devices: Subpart B – Unintentional Radiators and Subpart C – Intentional Radiators
3	CISPR 22 / EN55022	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.
4	ICES-003	Digital Apparatus, Industry Canada
5	RSS-210	Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands)
6	RSS-212	Test Facilities and Test Methods for Radio Equipment, Industry Canada (Provisional)
7	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)
- dB μ V - decibel per microvolt
- dB μ V/m - decibel of microvolt per meter
- GHz - gigahertz or 1000000000 hertz
- kHz - kilohertz or 1000 hertz
- MHz - megahertz or 1000000 hertz
- ms - millisecond or 0.001 second
- μ s - microsecond or 0.000001 second

3.2 Acronyms

- BT - Bluetooth
- EMC - Electromagnetic Compatibility
- EMI - Electromagnetic Interference
- EUT - Equipment under Test
- PRBS - Pseudo Random Bit Sequence
- RF - Radio Frequency

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.



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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
FCC Part 15.247(c)	BT	16-May-06	Functional	Phone (Black cover)	FCC ID:QMNRN-154 Type: RM-154 HW: B2.0 SW: BL100b05.nep ESN: 02601193613
FCC Part 15.247(c)	BT	16-May-06	N/A	Battery	Type: BL-6C Other: 3.7 Vdc
FCC Part 15.247(c)	BT	16-May-06	N/A	Charger	Type: AC-3U
FCC Part 15.247(c)	BT	16-May-06	N/A	Headset	Type: HS-3

5. TEST EQUIPMENT LIST

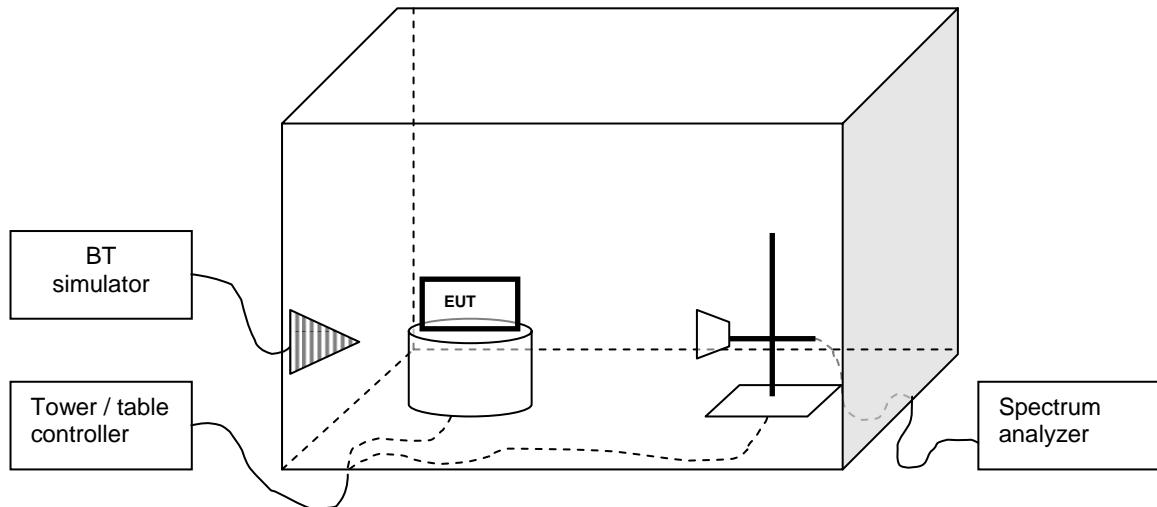
The listing below indicates the test equipment utilized for the test (s). Calibration interval on all items listed can be obtained from the Engineering Services Group within NMP, Product Creation - Dallas. Where relevant, measuring equipment is subjected to in-service checks between testing. TCC - Dallas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

Section of Report	NMP#	Test Equipment	Mfr. #	Model #	Calibration Due Date	Calibration Interval
7,8	04073	EMI Receiver	R&S	ESIB 26	03-Aug-06	12 months
7,8	02625	Base Station	R&S	CMU-200	30-Aug-06	12 months
7	02871	Biconilog Antenna	EMC Automation	3003C	08-July-06	12 months
7	04076	Horn Antenna	ETS	3117	18-Aug-06	12 months
7	02836	Turntable and Tower Controller	Sunol	FM2022 & 2846	N/A	N/A
8	00658	LISN	R&S	ESH-S5	07-July-06	12 months
8	02880	Biconilog Antenna	EMC Automation	3003C	23-Sep-06	12 months

6. EUT TEST SETUPS

For each test the EUT was exercised to find out the worst case of operation modes and device configuration.

6.1 EUT test set-up (radiated measurement)



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7. RADIATED EMISSIONS

Specification: FCC Part 15.247(c)(1); RSS-210 6.2.2(o), e1

7.1 Setup

Testing was performed in accordance with 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.

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210 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.

The measurement results are obtained as described below:

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

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



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7.2 Test Results

Test Operator	Viet Do
Date of Measurement	22-May-06
Temperature	22 °C
Humidity	40 %RH
Test Result	Complies

7.3 EUT operation mode

EUT operation mode	Connected, DH5, Static PRBS GFSK
EUT channel	0 (2402 MHz), 40 (2442 MHz), 78 (2480 MHz)
EUT TX power level	Nominal

7.4 Pass/Fail Criteria

Band	Frequency Range (MHz)	FCC Class B Limit (dBμV/m at 3m)	Detector
BT	30 – 88	40	QP
BT	88 – 216	43.5	QP
BT	216 – 960	46	QP
BT	960 – 1000	54	QP
BT	> 1000	74.0/ 54.0	PK/ AV



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7.5 Results

Peak (RBW/VBW: 1 MHz) Channel 0, GFSK

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4804.000000	47.50	237.14	36.70	10.80	VERTICAL	Passed
7206.000000	50.50	334.97	35.40	15.10	HORIZONTAL	Passed

Average (RBW/VBW: 1 MHz) Channel 0, GFSK

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4804.000000	34.60	53.70	23.80	10.80	VERTICAL	Passed
7206.000000	37.70	76.74	22.60	15.10	VERTICAL	Passed



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Quasi peak (RBW/VBW: 120 kHz) Channel 40, GFSK

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
38.176353	16.30	6.53	35.90	-19.60	VERTICAL	Passed

Peak (RBW/VBW: 1 MHz) Channel 40, GFSK

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
2867.863727	54.00	501.19	38.30	15.70	VERTICAL	Passed
12225.958918	57.30	732.82	34.80	22.50	HORIZONTAL	Passed
13385.273547	55.20	575.44	30.00	25.20	HORIZONTAL	Passed
15434.873747	56.50	668.34	30.70	25.80	VERTICAL	Passed
15736.470942	57.90	785.24	31.60	26.30	VERTICAL	Passed
16049.102204	58.00	794.33	31.10	26.90	HORIZONTAL	Passed
17979.455912	60.70	1,083.93	30.10	30.60	VERTICAL	Passed

Average (RBW/VBW: 1 MHz) Channel 40, GFSK

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
2870.363727	40.30	103.51	24.60	15.70	VERTICAL	Passed
12228.458918	43.60	151.36	21.10	22.50	HORIZONTAL	Passed
13388.773547	42.60	134.90	17.30	25.30	HORIZONTAL	Passed
15436.373747	43.70	153.11	17.90	25.80	VERTICAL	Passed
15734.470942	45.00	177.83	18.70	26.30	VERTICAL	Passed
16052.602204	45.00	177.83	18.10	26.90	HORIZONTAL	Passed
17981.955912	47.40	234.42	16.80	30.60	VERTICAL	Passed

Peak (RBW/VBW: 1 MHz) Channel 40, GFSK from Blue cover

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
1974.447896	65.50	1,883.65	56.00	9.50	VERTICAL	Passed

Average (RBW/VBW: 1 MHz) Channel 40, GFSK from Blue cover

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
1974.447896	49.90	312.61	40.40	9.50	VERTICAL	Passed



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Peak (RBW/VBW: 1 MHz) Channel 78, GFSK

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4960.000000	47.60	239.88	36.50	11.10	VERTICAL	Passed
7440.000000	50.90	350.75	35.40	15.50	HORIZONTAL	Passed

Average (RBW/VBW: 1 MHz) Channel 78, GFSK

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4960.000000	34.90	55.59	23.80	11.10	VERTICAL	Passed
7440.000000	38.20	81.28	22.70	15.50	VERTICAL	Passed



8. AC CONDUCTED EMISSIONS

Specification: FCC Part 15.207; RSS-210 6.6

8.1 Setup

The measurement is made according to FCC rules part 15.247 and IC standard RSS-210 as follows:

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

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

The measurement results are obtained as described below:

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

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

8.2 Test Results

Test Operator	Viet Do
Date of Measurement	2-Jun-06
Temperature	22 °C
Humidity	40 %RH
Test Result	Complies

8.3 EUT operation mode

EUT operation mode	Connected, DH5, Static PRBS GFSK.
EUT channel	0 (2402 MHz), 40 (2442 MHz), 78 (2480 MHz)
EUT TX power level	Nominal

8.4 Pass/Fail Criteria

Frequency Range	AC Conducted Emission Limits (CISPR 22)	
	Quasi-peak (dB μ V)	Average (dB μ V)
0.15MHz - 0.5MHz	66 - 56	56 - 46
0.5MHz - 5MHz -	56	46
5MHz - 30MHz	60	50



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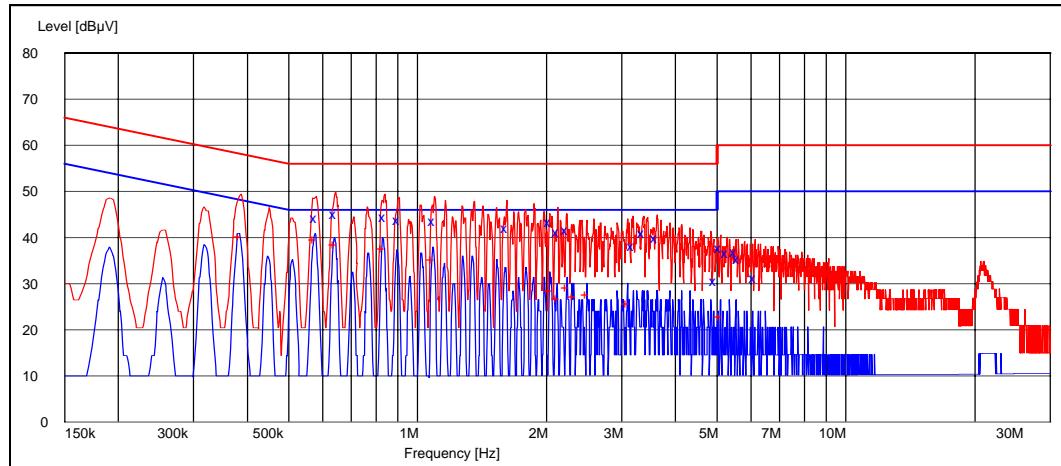
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8.5 Results

AC Conducted Emissions, GFSK



**Quasi peak (RBW/VBW: 9 kHz), GFSK**

Frequency [MHz]	U [dB μ V]	Line	Result
0.580000	44.30	N	Passed
0.645000	45.20	N	Passed
0.840000	44.40	N	Passed
0.905000	43.70	N	Passed
1.095000	43.50	N	Passed
1.615000	42.00	N	Passed
2.040000	43.30	L1	Passed
2.130000	41.20	N	Passed
2.235000	41.50	L1	Passed
3.195000	38.20	L1	Passed
3.370000	40.90	L1	Passed
3.615000	39.80	N	Passed
4.965000	30.60	L1	Passed
5.110000	37.80	L1	Passed
5.290000	36.60	L1	Passed
5.550000	36.80	L1	Passed
5.620000	35.40	L1	Passed
6.140000	31.10	N	Passed

Average (RBW/VBW: 9 kHz), GFSK

Frequency [MHz]	U [dB μ V]	Line	Result
0.385000	40.30	L1	Passed
0.575000	39.60	L1	Passed
0.640000	38.50	L1	Passed
0.830000	37.80	L1	Passed
1.085000	35.30	L1	Passed
2.040000	28.50	L1	Passed
2.125000	26.90	L1	Passed
2.235000	29.20	L1	Passed
2.320000	27.20	L1	Passed
2.490000	27.60	L1	Passed
3.095000	25.70	L1	Passed
5.105000	23.00	L1	Passed