EMC Test Report
For
RM-94

T183 **(EN ISO/IEC 17025)**

The test results are valid for the tested unit(s) only. This report shall not be reproduced except in full, without the written permission of the testing laboratory.

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1 CUSTOMER INFORMATION

Test laboratory: FCC registration number IC file number:	TCC Tampere Nokia Oyj Sinitaival 5 FIN-33720 TAMPERE Tel. +358 7180 08000 Fax. +358 7180 46800 94436 (June 14, 2002) IC 3608 (March 5, 2003)
Client:	Nokia Corporation Nokia Technology Platform Lise-Meitner-Strasse 10 D-89081 Ulm / Germany Tel. +49 731 1754 6728 Fax. +49 731 1754 6806
Contact person:	Thomas Reitmayer
Receipt of EUT:	19.1.2005
Date of testing:	21- 24.1.2005
Date of report:	04.02.2005

The tests listed in this report have been done to demonstrate compliance with the applicable requirements in FCC rules Part 15 and IC standard ICES-003.

Contents approved:

Jan-Erik Lilja Senior Test Engineer

2 EUT AND ACCESSORY INFORMATION

2.1 EUT description

The EUT is a mobile phone EUT is a triple band (GSM 900/1800/1900 EGPRS) mobile phone.

The highest internal frequency of the EUT is 3980 MHz.

2.2 EUT and accessories

The table below lists all EUTs and accessories used in the tests. Later in this test report, only numbers in the last column are used to refer to the devices in each test.

	Name	Type	S/N	Number
EUT	Mobile phone	RM-94	004400591701014	40153
Accessories	Battery	BL-5B	L403C10315876	40155
	Charger	ACP-12	-	40121
	Headset	HS-5	-	40161

Note! Phone HW ID is 3055

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SUMMARY OF TEST RESULTS

Section in CFR 47	Section in ICES-003		Result
15.107,a	5.3	AC powerline conducted emissions	PASS
15.109,a	5.5	Radiated emissions	PASS

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3 STANDARDS AND MEASUREMENT METHODS

The tests were performed in guidance of CFR 47 Part 15 Subpart B, ANSI C63.4 (2001), ICES-003 and CISPR 22. Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method".

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4 TEST RESULTS

4.1 AC powerline conducted emissions

EUT	40153		
Accessories	40121, 40155, 40161		
Temp, Humidity, Air Pressure	19ºC	51 % RH	1014 mbar
Date of measurement	24.1.2005		
FCC rule part	§15.107		
ICES-003 section	5.3		
Measured by	Jari Jantunen		
Result	**PASS**		

4.1.1 Limit

CISPR 22 Class B limit

Frequency band (MHz)	Quasi-peak limit (dBµV)	Average limit (dBµV)
0.15 – 0.5	66 – 56	56 – 46
0.5 – 5	56	46
5 – 30	60	50

4.1.2 EUT operation mode

EUT operation mode	GSM 1900, idle mode, BlueTooth standby
EUT operation voltage	115V/60Hz

4.1.3 EUT test setup

Picture 1 EUT test setup

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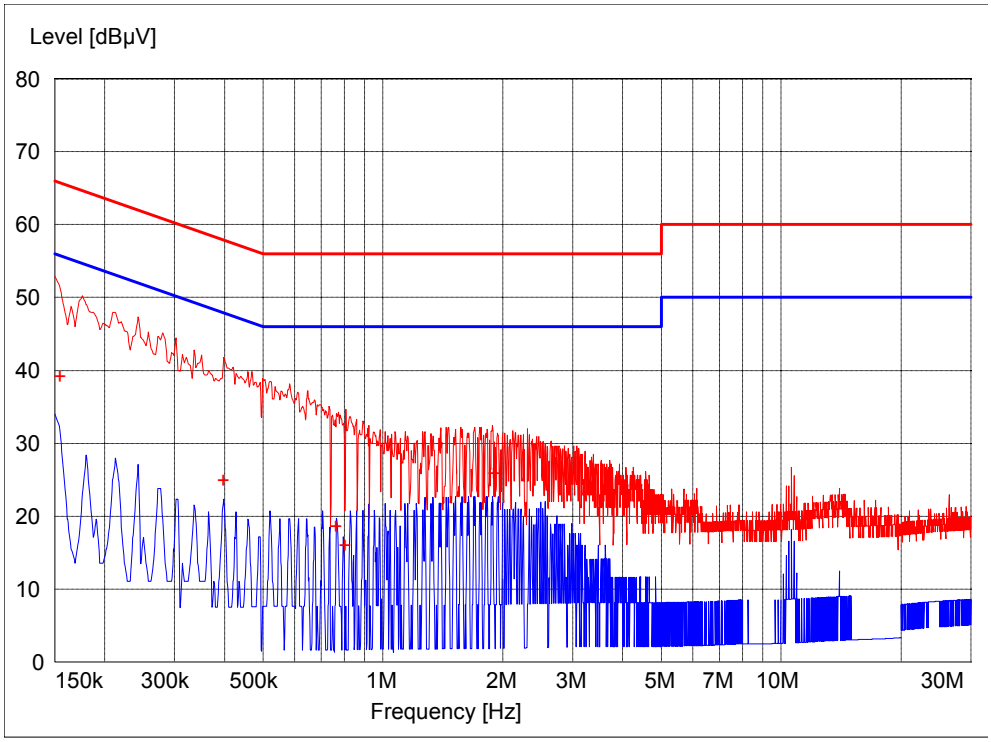
4.1.4 Emission measurement data



Picture 2 Emission measurement data

Table 1 Emission measurement data, average detector

Table 2 Emission measurement data, quasi peak detector

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin	Detector dB	Line	PE
0.154500	39.20	10.10	65.80	26.60	QP	N	GND
0.397500	24.90	10.10	57.90	33.00	QP	L1	GND
0.762000	18.60	10.20	56.00	37.40	QP	L1	GND
0.802500	16.00	10.20	56.00	40.00	QP	L1	GND
1.900500	25.90	10.40	56.00	30.10	QP	N	GND

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4.2 Radiated emissions

EUT	40153		
Accessories	40121, 40155, 40161		
Temp, Humidity, Air Pressure	21°C	47 %RH	980 mbar
Date of measurement	21.1.2005		
FCC rule part	§15.109		
ICES-003 section	5.5		
Measured by	Jari Jantunen		
Result	**PASS**		

4.2.1 Test method and level, 30 MHz – 8500 MHz

The test was made according to ANSI C63.4 (2001) with following execptions and additions:
1) The measurement was made in semi-anechoic chamber at measurement distance of 3m. The chamber had ferrite and absorber lining in all walls and ceiling, the floor was metal covered.
2) The measurement was divided in two parts; prescan and final measurement.

4.2.1.1 Prescan

a) The EUT was set on the turntable and measuring antenna in horizontal polarization at 1m.
b) The turntable was set to 0 degrees.
c) The receiver was set to record the maximum level using peak detector.
d) The antenna was raised from 1m to 4m in 1 meter steps.
e) For each antenna height the table was rotated full turn in 30 degree steps.
f) Antenna polarization was changed to vertical and phases b - e repeated.
g) All suspect frequencies were recorded in a file.
h) At every suspect frequency the turntable was rotated around, antenna scanned and the polarization changed to find the maximum levels.

4.2.1.2 Final measurement

a) The final measurement was run at suspect frequencies only using peak, quasipeak and average detector.
b) The turntable was rotated full turn to find out the worst azimuth.
c) On those azimuths obtained in b, the antenna was scanned from 1m to 4m to find out the worst elevation.
d) Phases b and c were repeated with another antenna polarization.
e) Obtained values were reported

CISPR 22 Class B limit (3m measuring distance)

Frequency band (MHz)	Quasi-peak limit (dBµV/m)
30 – 230	40
230 – 1000	47

Class B limit (3m measuring distance)

Frequency band (MHz)	Limit (µV/m)	Limit (dBµV/m)	Detector

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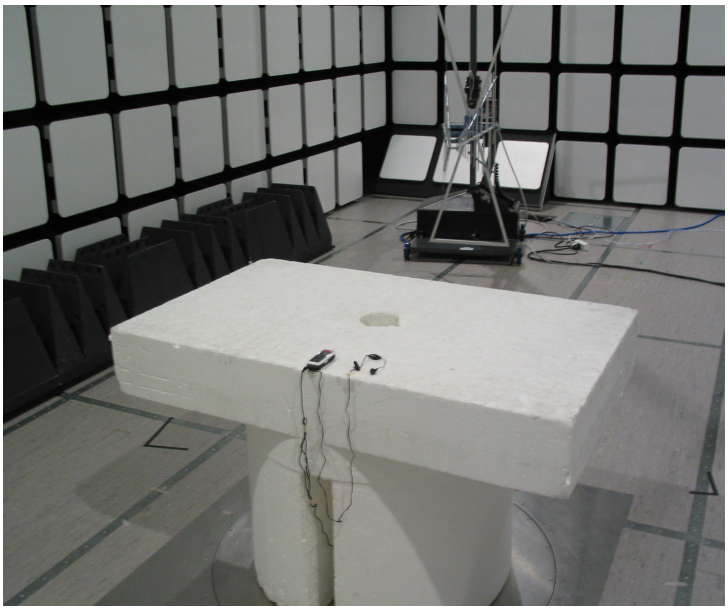
1000-8500	500 / 5000	54 / 74	AV / PK

4.2.2 EUT operation mode

EUT operation mode	GSM 1900, idle mode, BlueTooth standby
EUT operation voltage	115V/60Hz

4.2.3 EUT test setup



Picture 3 EUT test setup

4.2.4 Emission measurement data, 30 MHz – 8500 MHz

The measurement results were obtained as described below.

$$E[uV/m] = U_{RX} + A_{CABLE} + AF - G_{PREAMP}$$

Where

U_{RX} receiver reading

A_{CABLE} Attenuation of the cable

AF Antenna factor

G_{PREAMP} Gain of the preamplifier

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Table 3 GSM 1900, low channel, peak detector

Frequency MHz	Level dBµV/m	Margin dB	Polarisation
3860.000000	43.40	30.60	VERTICAL
7720.000000	45.00	29.00	VERTICAL

Table 4 GSM 1900, low channel, average detector

Frequency MHz	Level dBµV/m	Margin dB	Polarisation
3860.000000	33.00	21.00	VERTICAL
7720.000000	32.50	21.50	VERTICAL

Table 5 GSM 1900, mid channel, quasi-peak detector

Frequency MHz	Level dBµV/m	Margin dB	Polarisation
121.042285	14.60	28.90	VERTICAL

Table 6 GSM 1900, mid channel, peak detector

Frequency MHz	Level dBµV/m	Margin dB	Polarisation
3919.841683	44.10	29.90	HORIZONTAL
7840.179359	45.90	28.10	VERTICAL

Table 7 GSM 1900, mid channel, average detector

Frequency MHz	Level dBµV/m	Margin dB	Polarisation
3919.843687	36.00	18.00	HORIZONTAL
7839.679359	33.60	20.40	VERTICAL

Table 8 GSM 1900, high channel, peak detector

Frequency MHz	Level dBµV/m	Margin dB	Polarisation
3980.000000	42.80	31.20	VERTICAL
7960.000000	45.80	28.20	HORIZONTAL

Table 9 GSM 1900, high channel, average detector

Frequency MHz	Level dBµV/m	Margin dB	Polarisation
3980.000000	32.70	21.30	HORIZONTAL
7960.000000	33.10	20.90	VERTICAL

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