
EMC Test Report for RH-49



T183 (EN ISO/IEC 17025)

CONTENTS

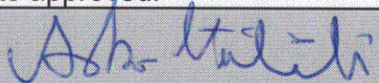
1	CUSTOMER INFORMATION	3
2	EUT AND ACCESSORY INFORMATION	4
2.1	EUT description	4
2.2	EUT and accessories	4
3	STANDARDS AND MEASUREMENT METHODS	6
4	TEST RESULTS	7
4.1	AC powerline conducted emissions	7
4.1.1	Limit	7
4.1.2	EUT operation mode.....	7
4.1.3	EUT test setup	7
4.1.4	Emission measurement data	8
4.2	Radiated emissions	10
4.2.1	Test method and level, 30MHz – 8500 MHz	10
4.2.2	EUT operation mode.....	11
4.2.3	EUT test setup	11
4.2.4	Emission measurement data, 30MHz - 8500 MHz.....	12

1 CUSTOMER INFORMATION

Test laboratory:	TCC Tampere Nokia Oyj Sinitaival 5 FIN-33720 TAMPERE Tel. +358 7180 08000 Fax. +358 7180 46800
FCC registration number IC file number:	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:	28.5.2004
Date of testing:	14.-20.6.2004
Date of report:	20.6.2004

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:


Name Position

2 EUT AND ACCESSORY INFORMATION

2.1 EUT description

The EUT is a triple band GSM 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	GSM Phone	RH-49	004400281793180	3405
Accessories	Battery	BL-5B	L103C20101787	3410
	AC Charger	ACP-12E	0675294399791K411LZ0000050	3418

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

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".

4 TEST RESULTS

4.1 AC powerline conducted emissions

EUT	3405		
Accessories	3410, 3418		
Temp, Humidity, Air Pressure	18°C	50 % RH	1002 mbar
Date of measurement	14.06.2004		
FCC rule part	§15.107		
ICES-003 section	5.3		
Measured by	Jan-Erik Lilja		
Result	PASS		

4.1.1 Limit

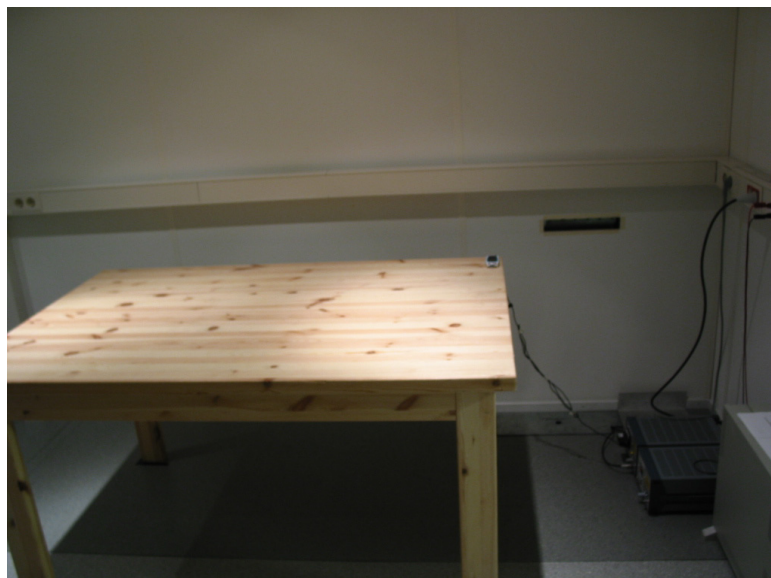
CISPR 22 Class B limit

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
EUT operation voltage	115V/60Hz

4.1.3 EUT test setup



Picture 1. AC conducted emission measurement setup

4.1.4 Emission measurement data

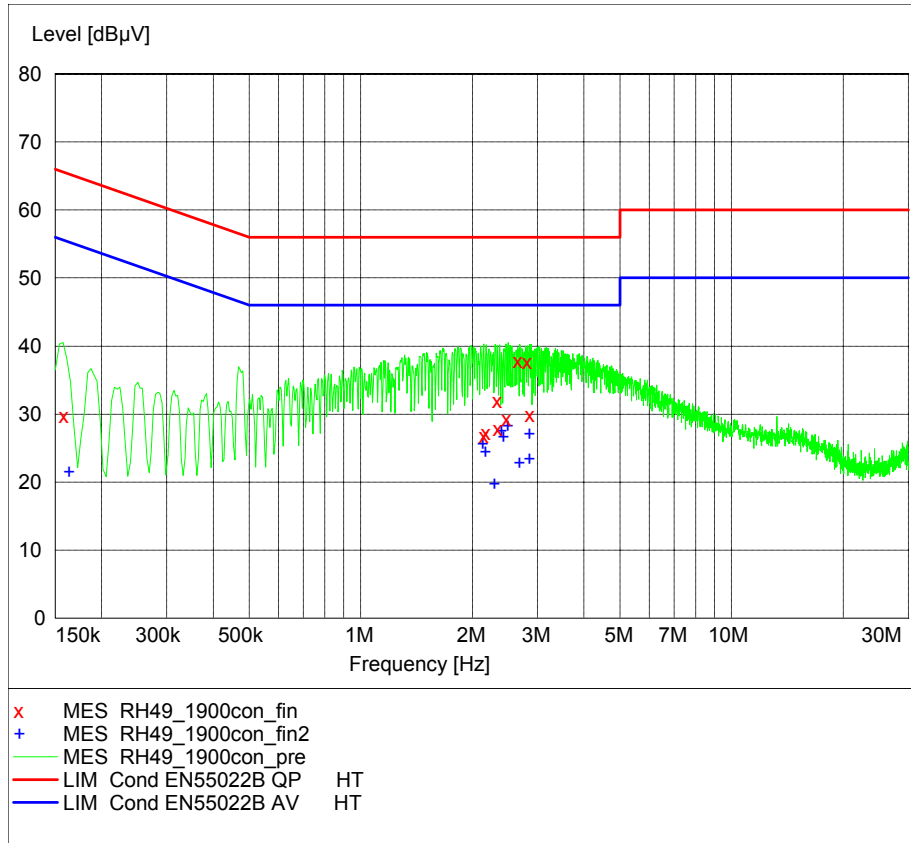


Table 1. Highest emission.

Frequency MHz	Level dBµV	QP Limit dBµV	QP Margin dB	Detector	Line	PE
0.159	29.7	65.9	36.2	QP	N	GND
2.153	26.8	58.0	31.2	QP	N	GND
2.189	27.2	58.0	30.8	QP	N	GND
2.342	31.9	58.0	26.1	QP	L1	GND
2.351	27.9	58.0	30.1	QP	L1	GND
2.481	29.3	58.0	28.7	QP	N	GND
2.661	37.8	58.0	20.2	QP	L1	GND
2.823	37.6	58.0	20.4	QP	L1	GND
2.873	29.9	58.0	28.1	QP	N	GND

Frequency MHz	Level dBµV	AV Limit dBµV	AV Margin dB	Detector	Line	PE
0.164	21.5	55.1	33.6	AV	L1	GND
2.135	25.6	48.0	22.4	AV	N	GND
2.166	24.4	48.0	23.6	AV	N	GND

Tampere

2.292	19.7	48.0	28.3	AV	N	GND
2.396	27.5	48.0	20.5	AV	N	GND
2.427	26.7	48.0	21.3	AV	N	GND
2.495	28.3	48.0	19.7	AV	N	GND
2.684	22.9	48.0	25.1	AV	N	GND
2.846	23.4	48.0	24.6	AV	N	GND
2.850	27.0	48.0	21.0	AV	N	GND

4.2 Radiated emissions

EUT	3405		
Accessories	3410, 3418		
Temp, Humidity, Air Pressure	21°C	45 %RH	1002 mbar
Date of measurement	14.6, 20.6.2004		
FCC rule part	§15.109		
ICES-003 section	5.5		
Measured by	Jari Jantunen		
Result	PASS		

4.2.1 Test method and level, 30MHz – 8500 MHz

The test was made according to ANSI C63.4 (2001) with following exceptions 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 (dB μ V/m)
30 – 230	40
230 – 1000	47

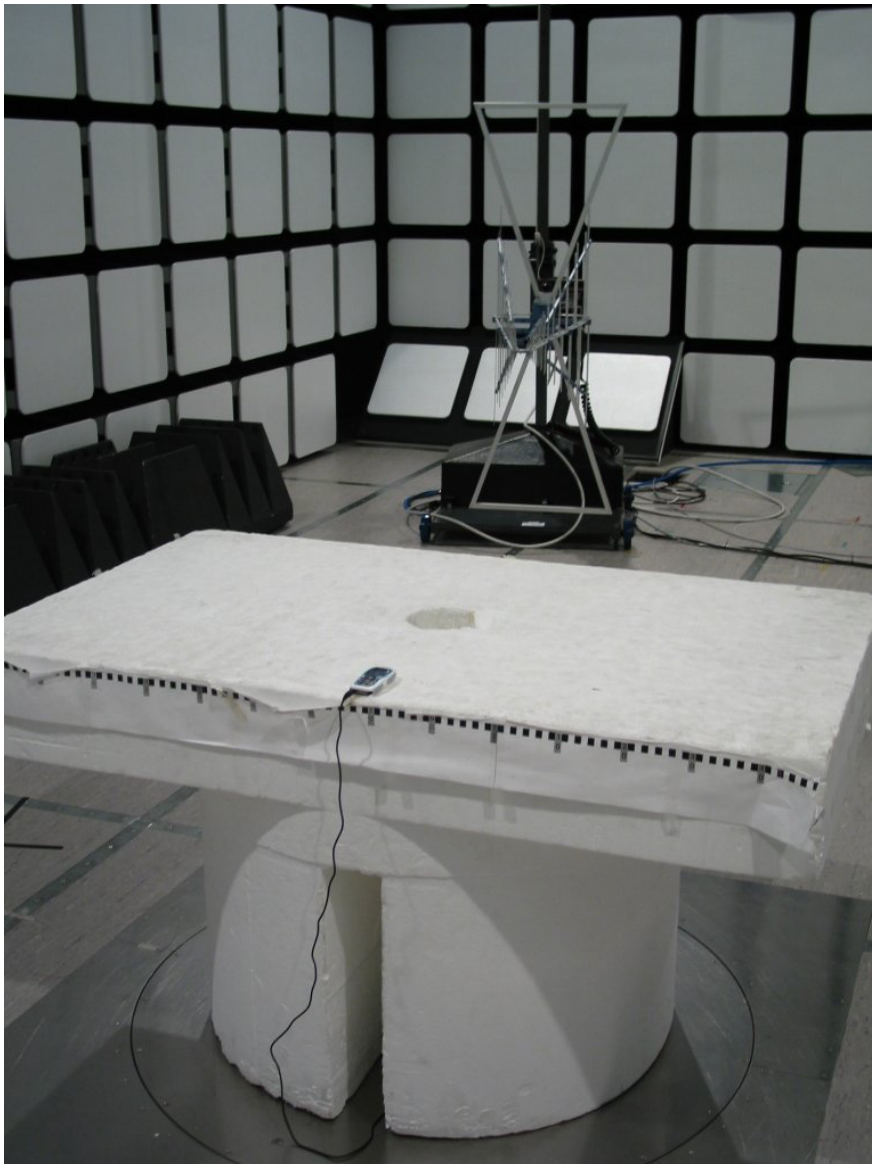
Class B limit (3m measuring distance)

Frequency band (MHz)	Limit ($\mu\text{V}/\text{m}$)	Limit ($\text{dB}\mu\text{V}/\text{m}$)	Detector
1000-8500	500 / 5000	54 / 74	AV / PK

4.2.2 EUT operation mode

EUT operation mode	GSM 1900, Idle
EUT operation voltage	115V/60Hz

4.2.3 EUT test setup



4.2.4 Emission measurement data, 30MHz - 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

Freq [MHz]	EMI QP [dB μ V/m]	Polarization
32.002405	11.00	Vertical
46.933667	9.00	Vertical
55.912425	15.80	Vertical
83.967735	12.50	Vertical
85.972545	12.80	Vertical
115.773146	13.20	Vertical