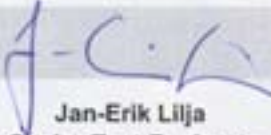


FCC Part 15B Compliance Test Report

Test Report no.:	Tre_FCC_0519_02.doc	Date of Report:	18.05.2005
Number of pages:	9	Customer's Contact person:	Ulla Valjakka
Testing laboratory:	TCC Nokia Tampere Laboratory P.O. Box 68 Sinitaival 5 FIN-33720 TAMPERE, FINLAND Tel. +358 (0) 7180 46800 Fax. +358 (0) 7180 46880	Client:	Nokia Corporation Arco Tower Shimomeguro 1-8-1 Meguro-ku TOKYO 153-0064 JAPAN Tel. +81 3 5759 7001 Fax. +81 3 5740 6858
FCC listing no.:	94436		
IC recognition no.:	3608		
Tested devices/ accessories:	Phone RM-109, Battery BL-5C, Charger ACP-12, Data cable DKU-2		
FCC ID:	QVVRM-109	IC:	661AE-RM109
Supplement reports:			
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart B, ANSI C63.4 (2003), ICES-003, CISPR 22 and IC standards RSS-132, RSS-133 and RSS-210. Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
Documentation:	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.		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document.		
Date and signature for the contents:	18-05-2005  Jan-Erik Lilja Senior Test Engineer		

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	4.5.2005
Testing completed	12.5.2005
The customer's contact person	Ulla Valjakka
Test Plan referred to	T:\Projects\RM-109\EMC\Test Plans\RM-109 EMC Testplan V0.2.xls
Notes	
Document name	T:\Projects\RM-109\EMC\Results\FCC\Tre_FCC_0519_02.doc

1.1. EUT and Accessory Information

The EUT is a single band (GSM1900) mobile phone with GPRS and EGPRS. GSM band is tested in idle mode.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-109	354350003363810	5440	-	1.15.05	40250
Battery	BL-5C	-	7.0	-	-	40104
Charger	ACP-12	-	1.3	-	-	40252
USB cable	DKU-2	-			-	40256
Laptop	DELL LATITUDE D600	0009321C-12800-8A5-2913	-	-	-	40085
Laptop charger	PA-12	00085391	-	-	-	40086
Printer	HP deskjet 1600CC3540A	USB8302546	-	-	-	40077
Digital camera	FUJI DS-7	7102516	-	-	-	40076
Serial cable for camera	-	-	-	-	-	40088
Parallel cable for printer	-	-	-	-	-	40087

1.2. Summary of Test Results

GSM 1900:

Section in CFR 47	Section in ICES-003 (RSS-133)	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	Passed
15.109, a	5.5 (9)	Radiated emissions	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 Tampere Laboratory.

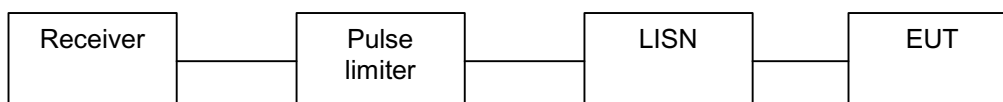
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2. AC powerline conducted emissions (FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	Phone: DUT 40250
Accessories with DUT numbers	Battery: DUT 40140 Charger: DUT 40252 USB cable: DUT 40256 Laptop: DUT 40085 Laptop charger: DUT 40086 Printer: DUT 40077 Digital camera: DUT 40076 Serial cable: DUT 40088 Parallel cable: DUT 40087
Operation Voltage V / Hz	115/60
Result	Passed
Remarks	Bluetooth RX mode
Temp °C / Humidity RH % / Air Pressure kPa	20/50/101.9
Date of measurements	12.05.2005
Measured by	Jan-Erik Lilja

2.1. Test setup



2.2. Test method and limit

The measurement is made according to ANSI C63.4-2003 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:

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

Where U_{RX} is receiver reading and $A_{CORRECTIONS}$ is combined correction factor including cable and pulse limiter attenuations.

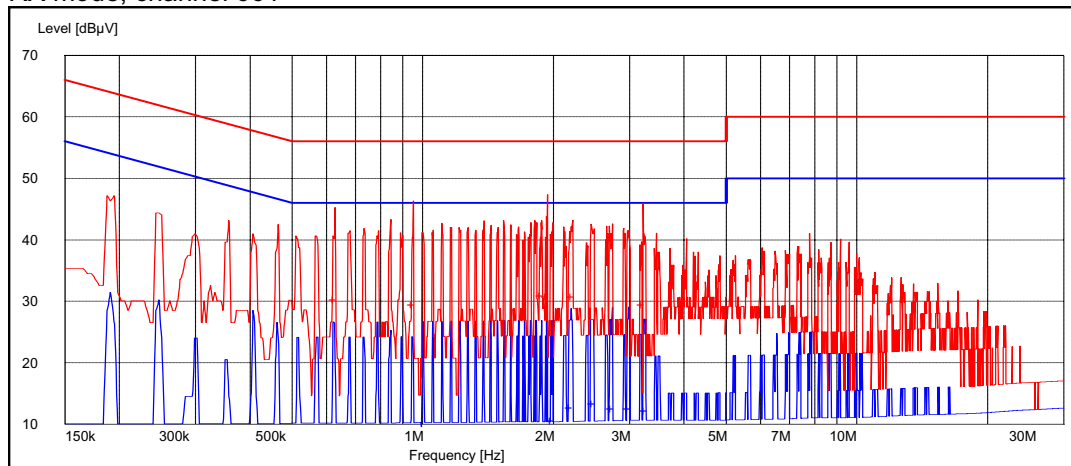
CISPR 22 Class B limits

Frequency range / MHz	Quasi peak limit / dB μ V	Average limit / dB μ V
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46

5 - 30	60	50
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2.3. GSM 1900 Test results

RX mode, channel 661



Quasi peak (RBW: 9 kHz)

Frequency / MHz	Level / dBμV	Line	Result
0.628257	30.20	N	Passed
0.950802	29.40	N	Passed
1.881363	30.90	N	Passed
1.936974	30.60	N	Passed
2.216433	30.70	N	Passed
3.220441	29.40	N	Passed

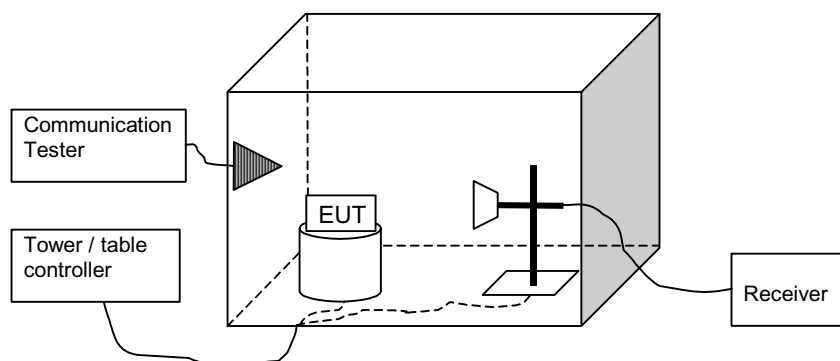
Average (RBW: 9 kHz)

Frequency / MHz	Level / dBμV	Line	Result
1.988878	10.60	L1	Passed
2.198397	12.60	N	Passed
2.474950	13.20	N	Passed
2.733467	12.50	N	Passed
2.991984	12.40	N	Passed
3.262525	12.10	N	Passed

3. Radiated emissions (FCC §15.109, ICES-003 section 5.5, RSS-132 6.6, RSS-133 9)

EUT with DUT number	Phone: DUT 40250
Accessories with DUT numbers	Battery : DUT 40140 Charger: DUT 40252 USB cable: DUT 40256 Laptop: DUT 40085 Laptop charger: DUT 40086 Printer: DUT 40077 Digital camera: DUT 40076 Serial cable: DUT 40088 Parallel cable: DUT 40087
Operation Voltage V / Hz	115/60
Result	Passed
Remarks	-
Temp °C / Humidity RH % / Air Pressure kPa	22/45/100.7
Date of measurements	11.05.2005
Measured by	Jan-Erik Lilja

3.1. Test setup



3.2. Test method and limit

The measurement is made according to ANSI C63.4-2003as follows:

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.

The EUT is placed on a nonconductive plate at 80 cm height.

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:

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

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

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

Frequency range / MHz	Quasi peak limit / dB μ V/m	Average limit / dB μ V/m	Peak limit / dB μ V/m
30 - 230	40	-	-
230 - 1000	47	-	-
Above 1000	-	54	74

3.3. GSM 1900 Test results

RX mode, channel 512

Peak (RBW: 1 MHz)

Frequency / MHz	Level / dB μ V/m	Level / μ V/m	A _{CORRECTION} / dB	Polarisation	Result
3860.000000	40.00	100.00	-3.10	VERTICAL	Passed
7720.000000	47.60	239.88	2.70	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency / MHz	Level / dB μ V/m	Level / μ V/m	A _{CORRECTION} / dB	Polarisation	Result
3860.000000	27.40	23.44	-3.10	VERTICAL	Passed
7720.000000	32.60	42.66	2.70	VERTICAL	Passed

RX mode, channel 661

Quasi peak (RBW: 120 kHz)

Frequency / MHz	Level / dB μ V/m	Level / μ V/m	A _{CORRECTION} / dB	Polarisation	Result
85.410621	23.80	15.49	-37.40	VERTICAL	Passed
393.186774	36.00	63.10	-31.80	VERTICAL	Passed
486.672745	30.90	35.08	-29.60	VERTICAL	Passed
501.302004	34.80	54.95	-29.20	VERTICAL	Passed

Peak (RBW: 1 MHz)

Frequency / MHz	Level / dB μ V/m	Level / μ V/m	A _{CORRECTION} / dB	Polarisation	Result
7840.179359	52.20	407.38	3.20	VERTICAL	Passed
7840.181363	52.10	402.72	3.20	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency / MHz	Level / dB μ V/m	Level / μ V/m	A _{CORRECTION} / dB	Polarisation	Result
7840.179359	36.90	69.98	3.20	VERTICAL	Passed
7840.181363	36.80	69.18	3.20	VERTICAL	Passed

RX mode, channel 810

Peak (RBW: 1 MHz)

Frequency / MHz	Level / dB μ V/m	Level / μ V/m	A _{CORRECTION} / dB	Polarisation	Result
3980.000000	40.80	109.65	-2.50	HORIZONTAL	Passed
7960.000000	57.20	724.44	3.30	VERTICAL	Passed

Average (RBW: 1 MHz)

Frequency / MHz	Level / dB μ V/m	Level / μ V/m	A _{CORRECTION} / dB	Polarisation	Result
3980.000000	28.20	25.70	-2.50	VERTICAL	Passed
7960.000000	34.90	55.59	3.30	VERTICAL	Passed

4. Test Equipment

4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM37610	Spectrum analyzer	FSU	R&S	15C,22/24
TM37678	Radio communication tester	CMU-200	R&S	15C,22/24
	Attenuator 10 dB	6251.17.A	Huber+Suhner AG	15C,22/24
TM22901	Step attenuator 110dB	8496A	Agilent	15C,22/24
TM37499	Power splitter	11667A	Agilent	15C,22/24
	Temperature chamber	VT4002	Vötsch	15C,22/24
TM38112	DC power supply	6632A	Agilent	15C,22/24
TM38111	Multimeter	34401A	Agilent	15C,22/24
TM38845	EMI receiver	ESI 40	R&S	15B,15C
TM37773	Radio communication tester	CMU-200	R&S	15B,15C
TM38631	Signal generator	83640L	Agilent	15B,15C
TM38114	DC power supply	6632A	Agilent	15B,15C
TM22835	Multimeter	87	Fluke	15B,15C
TM30600	Pulse Limiter	ESH3-Z2	R&S	15B,15C
TM26490	LISN 50 µH	ESH3-Z5/	R&S	15B,15C
TM30636	LISN 50 µH	L2-16/	PMM	15B,15C

4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30599	3m semi-anechoic chamber		TDK	15B,15C, 22/24
TM38845	EMI receiver	ESI 40	R&S	15B,15C, 22/24
TM37498	Preamplifier	AMF-5D-020180-26-10P	MITEQ	15B,15C, 22/24
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	MITEQ	15B,15C, 22/24
TM37516	Biconilog antenna	HL562	R&S	15B,15C, 22/24
TM26496	Double ridged waveguide antenna	3115	EMCO	15B,15C, 22/24
TM39158	Horn antenna	3116	EMCO	15B,15C, 22/24
TM26492	Reference dipole set	UHAP/VHAP	Schwarzbeck	15B,15C, 22/24
TM37501	Dipole antenna	3125-870	EMCO	22/24
TM37502	Dipole antenna	3125-1880	EMCO	22/24
TM37773	Radio communication tester	CMU-200	R&S	15B,15C, 22/24
TM38631	Signal generator	83640L	Agilent	15B,15C, 22/24
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	15B,15C, 22/24
	High pass filter	WHK2010-10SS	Trilithic	15B,15C, 22/24
	Low pass filter	WLK1750-10SS	Trilithic	15B,15C, 22/24
TM26511	Tunable notch filter	WRCA870	Wainwright	22/24
TM38215	Tunable notch filter	WRCD1850/1910-0.2/40	Wainwright	22/24
TM38214	Band reject filter	WRCT 2402/2480-2400/2483.5-30	Wainwright	15C
TM30642	Turntable controller	HD-100	Deisel	15B,15C, 22/24
TM26500	Turntable	DS412	Deisel	15B,15C, 22/24
TM38842	Antenna mast controller	2090	EMCO	15B,15C, 22/24
TM38843	Antenna mast	2075	EMCO	15B,15C, 22/24
TM38114	DC power supply	6632A	Agilent	15B,15C, 22/24
TM22835	Multimeter	87	Fluke	15B,15C, 22/24