TCC
Nokia

FINAS
Finnish Accreditation Service
T117 (EN ISO/IEC 17025)

FCC Part 15B Compliance Test Report

Test Report no.:	Salo_FCC_0511_11.doc	**Date of Report:**	07.04.2005
Number of pages:	11	**Customer's Contact person:**	Alison Kingston
Testing laboratory:	TCC Nokia Salo Laboratory P.O. Box 86 Joensuunkatu 7H / Kiila 1B FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 45220	**Client:**	Nokia Corporation Nokia House Summit Avenue, Southwood FARNBOROUGH HAMPSHIRE GU14 0NG UK Tel. +44 1252 866000 Fax. +44 1252 866001
FCC listing no.:	533467		
IC recognition no.:	5385		
Tested devices/ accessories:	**Phone RM-13 / Battery BL-5X, AC- Charger ACP-12 and Headset HS-15**		
FCC ID:	**QTKRM-13**	**IC:**	**661AD-RM13**
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:

07-04-2005

Kai Uusitalo
Senior Design Engineer, EMC

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	15.03.2005
Testing completed	24.03.2005
The customer's contact person	Alison Kingston
Test Plan referred to	T:\Projects\RM-13\testplans\EMC\TCC\RM-13_ EMC_Test_Plan.xls
Notes	-
Document name	T:\Projects\RM-13\results\emc\FCC\Salo_FCC_0511_11.doc

1.1. EUT and Accessory Information

The EUT is a triple band (GSM900/1800/1900) mobile phone with GPRS, EGPRS and Bluetooth. GSM band is tested in idle mode. Bluetooth is tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-13	004400/64/170355/6	0400	-	03.02	10460
Battery	BL-5X	0670471392066M021010000311	-	-	-	10427
AC-Charger	ACP-12E	06752943943491493120295910	-	-	-	10458
Headset	HS-15	0252	0.2	0.4	-	10549

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

Bluetooth:

Section in CFR 47	Section in ICES-003	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	PASSED
15.109, a	5.5	Radiated emissions	PASSED

PASSED	The EUT complies with the essential requirements in the standard.
FAILED	The EUT does not comply with the essential requirements in the standard.
NP	The test was not performed by the TCC Nokia Salo Laboratory.

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CONTENTS

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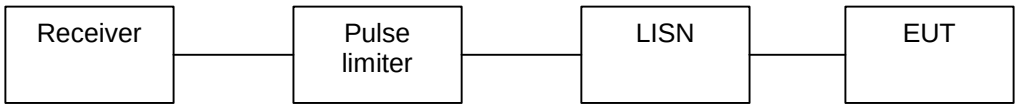
2. AC powerline conducted emissions

(FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RM-13, DUT 10460
Accessories with DUT numbers	BL-5X, DUT 10427; ACP-12, DUT 10458; HS-15, DUT 10549
Operation Voltage V / Hz	115V / 60Hz
Result	PASSED
Remarks	-
Temp °C / Humidity RH % / Air Pressure kPa	22 / 44 / 101.4
Date of measurements	24.03.2005
Measured by	Sami Lehtonen

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 / dBµV	Average limit / dBµV
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

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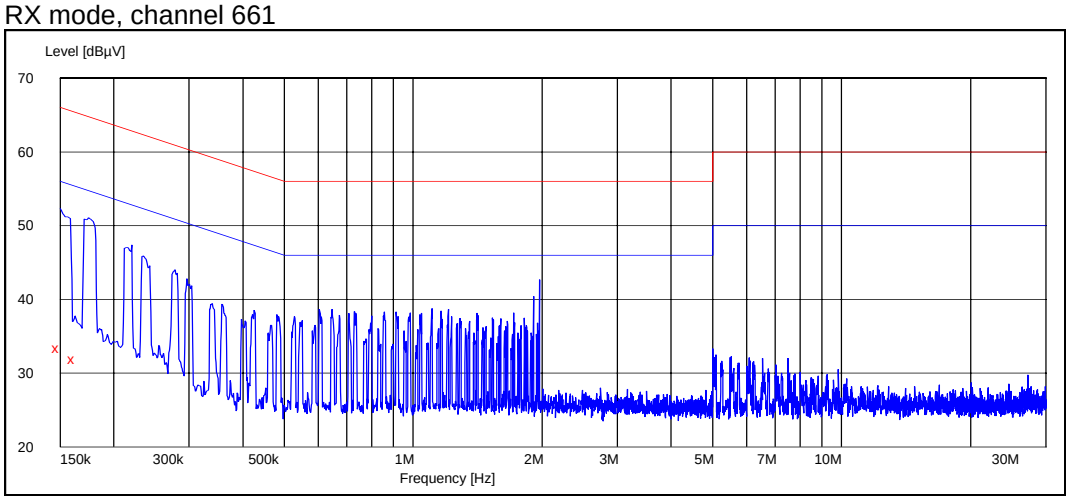
2.3. GSM 1900 Test results

RX mode, channel 661

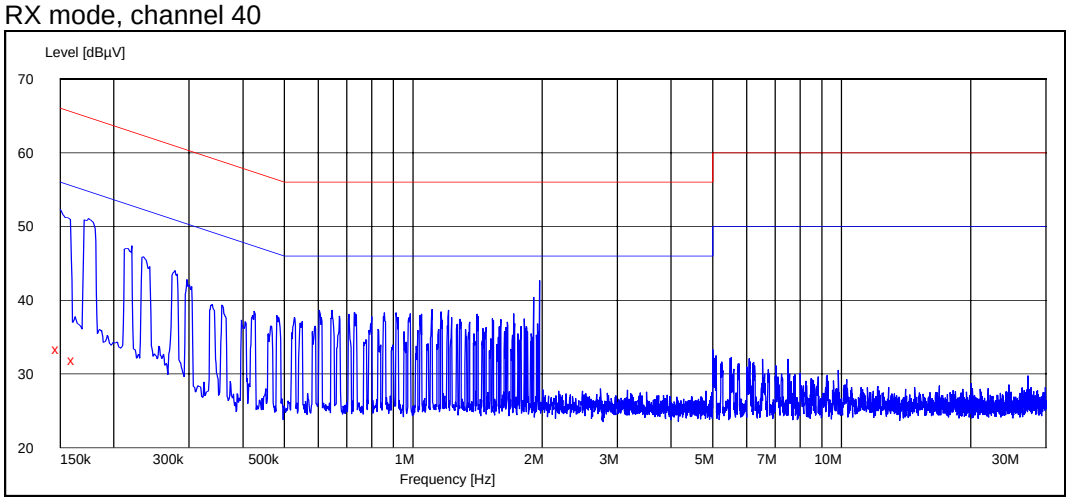


Quasi peak (RBW: 9 kHz)

Frequency / MHz	Level / dBµV	Line	Result
0.150000	33.40	N	PASSED
0.163500	31.90	N	PASSED

2.4. Bluetooth Test results

RX mode, channel 40



Quasi peak (RBW: 9 kHz)

Frequency / MHz	Level / dBµV	Line	Result
0.150000	33.40	N	PASSED
0.163500	31.90	N	PASSED

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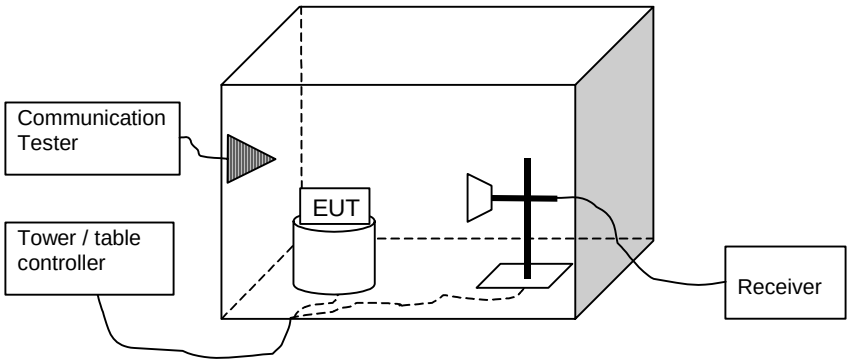
3. Radiated emissions

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

EUT with DUT number	RM-13, DUT 10460
Accessories with DUT numbers	BL-5X, DUT 10427; ACP-12, DUT 10458; HS-15, DUT 10549
Operation Voltage V / Hz	115V / 60Hz
Result	PASSED
Remarks	-
Temp °C / Humidity RH % / Air Pressure kPa	22 / 44 / 101.4
Date of measurements	17.03.2005
Measured by	Janne Niemi

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.

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The measurement results are obtained as described below:

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

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 / dBµV/m	Average limit / dBµV/m	Peak limit / dBµV/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 / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
3860.000000	39.30	92.26	-5.50	VERTICAL	PASSED
7720.000000	44.20	162.18	0.40	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
3860.000000	26.60	21.38	-5.50	VERTICAL	PASSED
7720.000000	31.10	35.89	0.40	VERTICAL	PASSED

RX mode, channel 661

Peak (RBW: 1 MHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
3920.000000	39.50	94.41	-5.60	HORIZONTAL	PASSED
7840.000000	44.90	175.79	1.00	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
3920.000000	26.50	21.13	-5.60	VERTICAL	PASSED
7840.000000	31.70	38.46	1.00	VERTICAL	PASSED

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RX mode, channel 810

Peak (RBW: 1 MHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
3980.000000	39.60	95.50	-5.40	VERTICAL	PASSED
7960.000000	44.80	173.78	1.60	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
3980.000000	26.70	21.63	-5.40	VERTICAL	PASSED
7960.000000	31.90	39.36	1.60	VERTICAL	PASSED

3.4. Bluetooth Test results

Channel 0

Peak (RBW: 1 MHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
4804.000000	42.90	139.64	-4.40	VERTICAL	PASSED
7206.000000	42.60	134.90	-1.00	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
4804.000000	27.00	22.39	-4.40	VERTICAL	PASSED
7206.000000	30.00	31.62	-1.00	VERTICAL	PASSED

Channel 40

Quasi peak (RBW: 120 kHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
36.092986	18.70	8.61	-19.50	VERTICAL	PASSED
37.995391	11.80	3.89	-20.60	VERTICAL	PASSED

Peak (RBW: 1 MHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
4882.000000	41.80	123.03	-4.20	VERTICAL	PASSED
7323.000000	43.10	142.89	-0.50	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
4882.000000	27.30	23.17	-4.20	VERTICAL	PASSED
7323.000000	30.50	33.50	-0.50	VERTICAL	PASSED

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Channel 78

Peak (RBW: 1 MHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
4960.000000	43.20	144.54	-3.90	VERTICAL	PASSED
7440.000000	43.20	144.54	0.00	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency / MHz	Level / dBµV/m	Level / µV/m	$A_{CORRECTION}$ / dB	Polarisation	Result
4960.000000	27.90	24.83	-3.90	VERTICAL	PASSED
7440.000000	30.00	31.62	0.00	VERTICAL	PASSED

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4. Test Equipment

4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1742	EMI Test Receiver	ESMI	R&S	15C, 15B
1759	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
1872	Thermo- Hygrograph	00.02520.150700	Lambrecht	15C, 15B
1916	Radio Communication tester	CMTA84	R&S	15C, 15B
2039	Power Supply	PL330QMD	THURLBY	15C, 15B
2060	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
2068	CDN-Antenna line	S1	NMP	15C, 15B
2097	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
2111	Multimeter	TX3	Tektronix	15C, 15B
2156	Digital Radio Communication Tester	CMU200	R&S	15C, 15B
2206	Signal generator	SMX	R&S	15C, 15B
2335	GPIB Switch 2 to 1	-	National Instruments	15C, 15B
2347	Digital Radio Communication Tester	CMU200	R&S	22/24, 15C, 15B
2352	Spectrum Analyzer	FSP	R&S	22/24, 15C
-	RF Emission Software	ES-K1 v.1.60	R&S	15C, 15B

4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1748	Log. per. Antenna	HL025	R&S	22/24, 15C
1749	Log. per. Antenna	HL025	R&S	22/24, 15C
1875	Thermo- Hygrograph	00.02520.150700	Lambrecht	22/24, 15C, 15B
1917	Radio Communication tester	CMTA84	R&S	22/24, 15C, 15B
1933	Precision half-wave dipole antennas	HZ-13	R&S	22/24, 15C
1938	Precision half-wave dipole antennas	HZ-12	R&S	22/24, 15C
2004	Relay Switch Unit	RSU	R&S	22/24, 15C, 15B
2006	Radiation Reference Source	VSQ	MEB	22/24, 15C, 15B
2009	Signal generator	SMP 22	R&S	22/24, 15C, 15B
2019	Multimeter	34401A	HP	22/24, 15C, 15B
2027	Coupling and Decoupling Network	M2 (modified) DC1	MEB	22/24, 15C, 15B
2028	Coupling and Decoupling Network	M3 (modified) DC2	MEB	22/24, 15C, 15B
2029	Power Supply	PL330	THURLBY	22/24, 15C
2043	Band Reject Filter	WRCA824/849-0,2-6SS	Wainwright	22/24, 15C, 15B
2047	Band Reject Filter	WRCC1800/2000-0.2-10SS	Wainwright	22/24, 15C, 15B
2051	High Pass Filter	4HC1700-1-KK	R&S	22/24, 15C
2057	Log. per. Antenna	HL025	R&S	22/24, 15C
2109	Power Supply	PL330QMD	THURLBY	22/24, 15C, 15B
2110	Multimeter	34401A	HP	22/24, 15C, 15B
2112	Multimeter	TX3	Tektronix	22/24, 15C, 15B
2116	Controller	EMCO MODEL 2090	ETS	22/24, 15C, 15B

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Eq. No	Equipment	Type	Manufacturer	Used in
2133	Power Meter	NRVS	R&S	22/24, 15C
2134	Power Sensor	NRV-Z32	R&S	22/24, 15C
2135	Coupling and Decoupling Network	CDN 801-M3	LÜTHI	22/24, 15C, 15B
2138	Ultra Broadband Antenna	HL562	R&S	22/24, 15C, 15B
2140	Biconial Antenna	EMCO93110B	EMCO	22/24, 15C
2142	Log.-per.-dipol Antenna	3146	EMCO	22/24, 15C
2144	Attenuator	6803.17B	Huber-Suhner	22/24, 15C, 15B
2150	High Pass Filter	F-15041	RLC ELECTRONICS	22/24, 15C
2176	Coupling and Decoupling Network	CDN 801-M3	LÜTHI	22/24, 15C, 15B
2180	Digital Radio Communication Tester	CMU200	R&S	22/24, 15C, 15B
2188	Preamplifier	AFS4-00100300-20-23P-6	MITEQ	22/24, 15C, 15B
2330	EMI Test receiver	ESIB26	R&S	22/24, 15C, 15B
2334	GPIB Switch 2 to 1	-	National Instruments	22/24, 15C, 15B
2348	Yaesu controller	G-1000DXC	YAESU	22/24, 15C, 15B
2349	Computer controller (Yaesu)	GS-232B	YAESU	22/24, 15C, 15B
2350	Preamplifier	AMF-6D-020180-29-20P	MITEQ	22/24, 15C
2398	Horn antenna	HF906	R&S	22/24, 15C
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24, 15C, 15B

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