

FCC Part 15B Compliance Test Report

Test Report no.:	Salo_FCC_0544_09.doc	Date of Report:	04.11.2005
Number of pages:	9	Customer's Contact person:	Stefan Emery
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FCC listing no.:	533467		
IC recognition no.:	5385		
Tested devices/ accessories:	Phone RM-91 / Battery BL-5B, AC-Charger AC-4E, Data Cable CA-53, Laptop IBM T30, Laptop Charger AA21070, Digital Camera C-1400L, Serial Cable DSS-98A, Printer C3941A, Parallel Cable		
FCC ID:	QFXRM-91	IC:	661Z-RM91
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:			

Tomi Lipponen, System Manager

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	15.10.2005
Testing completed	03.11.2005
The customer's contact person	Stefan Emery
Test Plan referred to	T:\Projects\RM-91\TestPlan_RS\ RM-91_EMC testplan.xls
Notes	-
Document name	T:\Projects\RM-91\EMC\Results\FCC\Salo_FCC_0544_09.doc

1.1. EUT and Accessory Information

The EUT is a five band (GSM850/900/1800/1900 and WCDMA1900) mobile phone with GPRS, EGPRS and Bluetooth. GSM and WCDMA bands are tested in idle mode. Bluetooth is tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-91	004400/68/162182/5	4002	-	1.0536.0.6	10856
Battery	BL-5B	0670455363807M183412200283	-	-	-	10857
AC-Charger	AC-4E	3997915194051101615;0675384	1.1	1.0	-	10858
Data Cable	CA-53	108382534101	-	-	-	10859
Laptop	IBM T-30	99-ZYWH6	-	-	-	10852
Laptop Charger	AA21070	11S02K6654Z1Z0Z41895B9	-	-	-	10853
Digital Camera Olympus	C-1400L	3078394	-	-	-	10850
Serial Cable for Camera	DSS-98A	-	-	-	-	10851
Printer H&P LaserJet 5L	C3941A	CNVMO55419	-	-	-	10854
Parallel Cable for printer	-	-	-	-	-	10855

1.2. Summary of Test Results

WCDMA 1900 (Band II):

Section in CFR 47	Section in ICES-003 (RSS-133)	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	NP
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 Salo Laboratory.

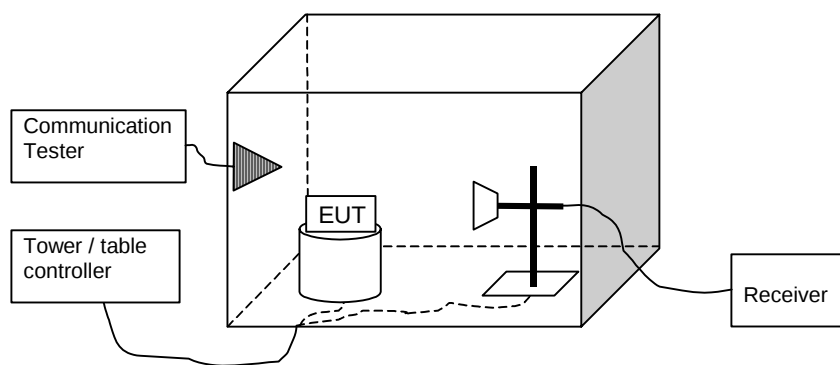
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2. Radiated emissions (FCC §15.109, ICES-003 section 5.5, RSS-132 6.6, RSS-133 9)

EUT with DUT number	RM-91, DUT 10856
Accessories with DUT numbers	BL-5B, DUT 10857; AC-4E, DUT 10858; CA-53, DUT 10859; IBM T30, DUT 10852; AA21070, DUT 10853; C-1400L, DUT 10850; DSS-98A, DUT 10851; C3941A, DUT 10854; Parallel Cable, DUT 10855
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Continuous data transfer was active between phone and the computer during the test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 101
Date of measurements	03.11.2005
Measured by	Tomi Lipponen

2.1. Test setup



2.2. 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:

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

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

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

2.3. WCDMA 1900 Test results

RX mode, channel 9262

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
55.090982	34.00	50.12	63.50	-29.50	VERTICAL	PASSED
312.926453	17.30	7.33	44.20	-26.90	VERTICAL	PASSED
328.157715	17.20	7.24	43.70	-26.50	VERTICAL	PASSED
339.580160	25.40	18.62	51.80	-26.40	VERTICAL	PASSED
345.291383	25.60	19.05	52.00	-26.40	VERTICAL	PASSED
365.432265	22.40	13.18	48.40	-26.00	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
1093.686373	34.10	50.70	47.70	-13.60	HORIZONTAL	PASSED
2492.491984	32.00	39.81	35.20	-3.20	VERTICAL	PASSED
2963.923848	34.20	51.29	35.80	-1.60	VERTICAL	PASSED
7952.903808	33.20	45.71	26.00	7.20	VERTICAL	PASSED

RX mode, channel 9400

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
51.283768	38.40	83.18	66.00	-27.60	VERTICAL	PASSED
74.508016	38.60	85.11	68.00	-29.40	HORIZONTAL	PASSED
86.413026	35.10	56.89	63.20	-28.10	VERTICAL	PASSED
320.240882	19.60	9.55	46.30	-26.70	HORIZONTAL	PASSED
347.894589	34.90	55.59	61.20	-26.30	HORIZONTAL	PASSED
399.799599	35.50	59.57	60.80	-25.30	VERTICAL	PASSED

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3919.843687	42.40	131.83	45.60	-3.20	VERTICAL	PASSED
3921.841683	41.90	124.45	45.10	-3.20	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2496.491984	32.10	40.27	35.20	-3.10	VERTICAL	PASSED
2501.500000	32.10	40.27	35.00	-2.90	VERTICAL	PASSED
2995.497996	34.60	53.70	35.90	-1.30	VERTICAL	PASSED
3214.420842	26.50	21.13	30.00	-3.50	HORIZONTAL	PASSED
3919.843687	27.50	23.71	30.70	-3.20	VERTICAL	PASSED
3920.341683	27.30	23.17	30.50	-3.20	VERTICAL	PASSED
7876.251503	33.10	45.19	26.80	6.30	VERTICAL	PASSED

RX mode, channel 9538

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
51.381363	37.00	70.79	64.60	-27.60	VERTICAL	PASSED
303.806413	19.10	9.02	45.90	-26.80	VERTICAL	PASSED
310.221643	23.10	14.29	50.10	-27.00	VERTICAL	PASSED
317.134469	16.40	6.61	43.20	-26.80	VERTICAL	PASSED
331.663327	25.30	18.41	51.70	-26.40	VERTICAL	PASSED
348.496994	28.20	25.70	54.50	-26.30	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
1664.326653	27.90	24.83	35.90	-8.00	VERTICAL	PASSED
2497.491984	32.10	40.27	35.10	-3.00	VERTICAL	PASSED
3220.944890	26.60	21.38	30.10	-3.50	HORIZONTAL	PASSED
7952.901804	33.20	45.71	26.00	7.20	VERTICAL	PASSED

3. Test Equipment

3.1. 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
2359	Temperature Test system	VT4002	Vötsch Industrietechnik	22/24
2360	Serial Bus Converter	Serial 488A	IO Tech	22/24
2362	Power Supply	NGPX 70/5	R&S	22/24
-	RF Emission Software	ES-K1 v.1.60	R&S	15C, 15B

3.2. 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

Eq. No	Equipment	Type	Manufacturer	Used in
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
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	Biconical 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	GPIO 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
2361	Anechoic chamber	3 meter semi/full anechoic chamber	Euroshield	22/24, 15C, 15B
2398	Horn antenna	HF906	R&S	22/24, 15C
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24, 15C, 15B