FCC Part 15C Compliance Test Report

Test Report no.:	Salo_FCC_0902_08.doc	**Date of Report:**	16-Jan-2009
Number of pages:	10	**Customer's Contact person:**	Markku Porttila
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	**Customer:**	Nokia Corporation Nokia House Summit Avenue, Southwood FARNBOROUGH HAMPSHIRE GU14 0NG UK Tel. +44 1252 866000 Fax. +44 1252 866001
FCC listing no.: **IC recognition no.:**	533467 661V-1		
Tested devices/ accessories:	**Phone RM-350 / Battery BL-6F and AC-Charger AC-5**		
FCC ID:	QFXRM-350	**IC:**	661Z-RM350
Supplement reports:	-		
Testing has been carried out in accordance with:	**CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2003), Public Notice DA 00-705, DTS procedures KDB 558074, IC standards RSS-GEN (Issue 2, June 2007) and RSS-210 (Issue 7, June 2007). 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:	 Digitally signed by Sami Lehtonen Date: 2009.01.16 10:20:03 +02'00'		

Sami Lehtonen, Test System Manager

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	11-Dec-2008
Testing completed	16-Dec-2008
The customer's contact person	Markku Porttila
Test Plan referred to	T:\Projects\RM-348\TestPlan_RS\RS_Testplan_RM-348_CR_HWID9004.xls
Notes	-
Document name	T:\Projects\RM-350\EMC\Results\FCC\Salo_FCC_0902_08.doc

1.1. EUT and Accessory Information

The EUT is a 6-band (GSM850/900/1800/1900 and WCDMA Band II/V) mobile phone with GPRS, EGPRS, Bluetooth, WLAN and FM transmitter.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-348	356387023436141	9004	-	10.046	13331
Battery	BL-6F	4944558293042372259;0670523	-	-	-	13332
AC-Charger	AC-5E	3997918093010906078;0675540	-	-	-	13333

1.2. Summary of Test Results

FM TX:

Section in CFR 47	Section in RSS-210	Name of the test	Result
15.239(a)	A2.8	Field strength of the fundamental signal	PASSED
15.239(c)	A2.8	Spurious radiated emissions	PASSED
15.207	6.6	AC powerline conducted emissions	NP
15.239(a)	A2.8	26 dB bandwidth	NP

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.

The test results of QXFRM-348 are re-used for certification of the QXFRM-350. The table above indicates the results, which will be re-used

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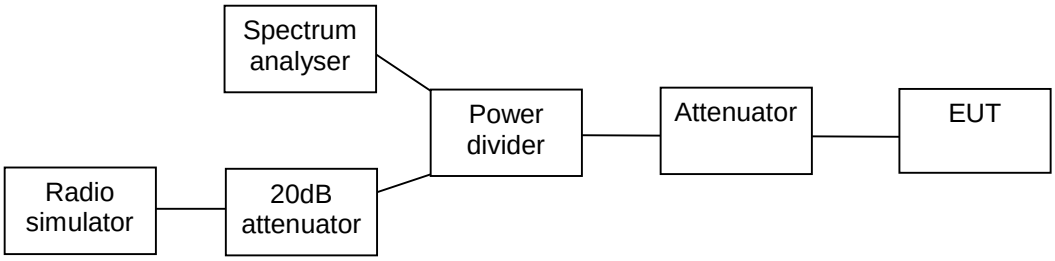
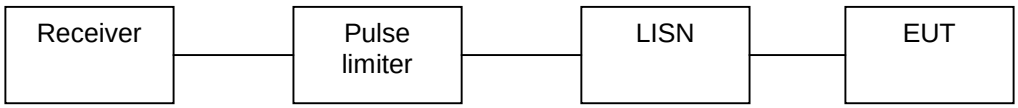
2. Test setups

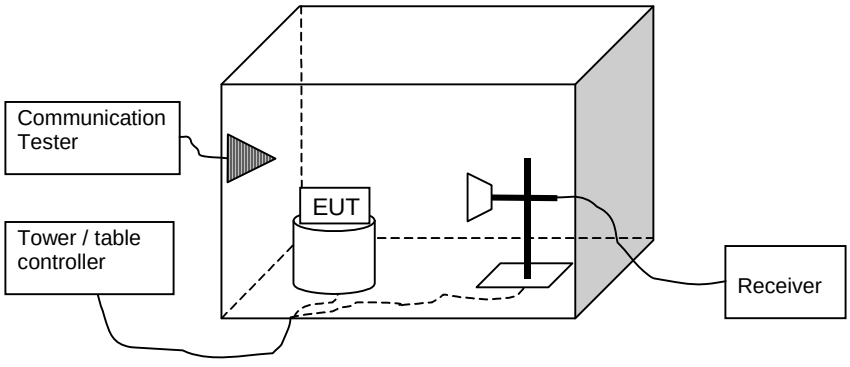
2.1. Conducted RF test setup



2.2. AC powerline conducted emissions test setup



2.3. Radiated test setup



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3. Field strength of the fundamental signal

(FCC §15.239(a), RSS-210 A2.8)

EUT with DUT number	RM-348, DUT 13331
Accessories with DUT numbers	BL-6F, DUT 13332; AC-5E, DUT 13333
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	18 / 42 / 100.1
Date of measurements	16-Dec-2008
Measured by	Sami Lehtonen

3.1. Test method and limit

The measurement is made according to ANSI C63.4 and IC standard RSS-210.

Limits for field strength of the fundamental signal measurements (3 m measurement distance)

Limit [µV/m]	Limit [dBµV/m]	Detector
250	48	Average
2500	68	Peak

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3.2. FM TX Test results

Peak (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
88.100000	44.10	160.32	70.70	-26.6	HORIZONTAL	PASSED
98.000000	43.20	144.54	70.00	-26.8	HORIZONTAL	PASSED
107.900000	42.40	131.83	69.30	-26.9	HORIZONTAL	PASSED

Average (RBW: 120 kHz, VBW: 300 kHz)

Channel / f_C [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
Low / 88.1	40.90	110.92	67.50	-26.6	HORIZONTAL	PASSED
Middle / 98.0	40.40	104.71	67.20	-26.8	HORIZONTAL	PASSED
High / 107.9	39.70	96.61	66.60	-26.9	HORIZONTAL	PASSED

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4. Spurious radiated emissions

(FCC §15.239(c), RSS-210 A2.8)

EUT with DUT number	RM-348, DUT 13331
Accessories with DUT numbers	BL-6F, DUT 13332; AC-5E, DUT 13333
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	18 / 42 / 100.1
Date of measurements	16-Dec-2008
Measured by	Sami Lehtonen

4.1. Test method and limit

The measurement is made according to ANSI C63.4 and IC standard RSS-210 as follows:

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

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:

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

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

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Limits for spurious radiated emissions measurements (3 m measurement distance)

Frequency range [MHz[	Limit [µV/m]	Limit [dBµV/m]	Detector
30 – 88	100	40	Quasi peak
88 – 216	150	43.5	Quasi peak
216 – 960	200	46	Quasi peak
960 – 1000	500	54	Quasi peak
1000 – 1100	500	54	Average
1000 – 1100	5000	74	Peak

Spurious radiated emissions shall not exceed the field strength of the fundamental signal at any frequencies.

4.2. FM TX Test results

Low channel / 88.1 MHz

Quasi peak (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
33.263768	36.00	63.10	52.10	-16.1	VERTICAL	PASSED
36.247575	24.70	17.18	42.60	-17.9	VERTICAL	PASSED
52.204469	24.90	17.58	52.70	-27.8	VERTICAL	PASSED
53.232405	26.60	21.38	55.20	-28.6	VERTICAL	PASSED
53.726333	26.00	19.95	55.00	-29.0	VERTICAL	PASSED

Middle channel / 98.0 MHz

Quasi peak (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
33.063768	26.80	21.88	42.80	-16.0	VERTICAL	PASSED
36.447575	21.70	12.16	39.80	-18.1	VERTICAL	PASSED
52.604469	26.10	20.18	54.30	-28.2	VERTICAL	PASSED
53.082405	27.10	22.65	55.60	-28.5	VERTICAL	PASSED
53.626333	33.30	46.24	62.20	-28.9	VERTICAL	PASSED

High channel / 107.9 MHz

Quasi peak (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
33.213768	31.40	37.15	47.50	-16.1	VERTICAL	PASSED
36.097575	26.70	21.63	44.50	-17.8	VERTICAL	PASSED
52.004469	26.70	21.63	54.40	-27.7	VERTICAL	PASSED
53.182405	26.90	22.13	55.50	-28.6	VERTICAL	PASSED
53.626333	26.00	19.95	54.90	-28.9	VERTICAL	PASSED

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5. Test Equipment

5.1. 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	22/24/27, 15C, 15B
2352	Spectrum Analyzer	FSP	R&S	22/24/27, 15C
2359	Temperature Test system	VT4002	Vötsch Industrietechnik	22/24/27
2360	Serial Bus Converter	Serial 488A	IO Tech	22/24/27
2362	Power Supply	NGPX 70/5	R&S	22/24/27
2388	Bluetooth Tester	CBT	R&S	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24/27, 15C, 15B

5.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
1748	Log. per. Antenna	HL025	R&S	22/24/27, 15C
1749	Log. per. Antenna	HL025	R&S	22/24/27, 15C
1875	Thermo- Hygrograph	00.02520.150700	Lambrecht	22/24/27, 15C, 15B
1917	Radio Communication tester	CMTA84	R&S	22/24/27, 15C, 15B
1933	Precision half-wave dipole antennas	HZ-13	R&S	22/24/27, 15C
1938	Precision half-wave dipole antennas	HZ-12	R&S	22/24/27, 15C
2006	Radiation Reference Source	VSQ	MEB	22/24/27, 15C, 15B
2009	Signal generator	SMP 22	R&S	22/24/27, 15C, 15B
2019	Multimeter	34401A	HP	22/24/27, 15C, 15B
2027	Coupling and Decoupling Network	M2 (modified) DC1	MEB	22/24/27, 15C, 15B
2028	Coupling and Decoupling Network	M3 (modified) DC2	MEB	22/24/27, 15C, 15B
2029	Power Supply	PL330	THURLBY	22/24/27, 15C, 15B
2043	Band Reject Filter	WRCA824/849-0,2-6SS	Wainwright	22, 15C, 15B
2047	Band Reject Filter	WRCC1800/2000-0.2-10SS	Wainwright	24, 15C, 15B
2048	Band Reject Filter	WRCC1700/1800-0.2-10SS	Wainwright	27, 15C, 15B
2051	High Pass Filter	4HC1700-1-KK	R&S	22/24/27, 15C
2057	Log. per. Antenna	HL025	R&S	22/24/27, 15C
2109	Power Supply	PL330QMD	THURLBY	22/24/27, 15C, 15B
2110	Multimeter	34401A	HP	22/24/27, 15C, 15B
2112	Multimeter	TX3	Tektronix	22/24/27, 15C, 15B
2116	Controller	EMCO MODEL 2090	ETS	22/24/27, 15C, 15B
2133	Power Meter	NRVS	R&S	22/24/27, 15C
2134	Power Sensor	NRV-Z32	R&S	22/24/27, 15C
2135	Coupling and Decoupling Network	CDN 801-M3	LÜTHI	22/24/27, 15C, 15B

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Eq. No	Equipment	Type	Manufacturer	Used in
2138	Ultra Broadband Antenna	HL562	R&S	22/24/27, 15C, 15B
2140	Biconical Antenna	EMCO93110B	EMCO	22/24/27, 15C
2142	Log.-per.-dipol Antenna	3146	EMCO	22/24/27, 15C
2144	Attenuator	6803.17B	Huber-Suhner	22/24/27, 15C, 15B
2150	High Pass Filter	F-15041	RLC ELECTRONICS	22/24/27, 15C
2176	Coupling and Decoupling Network	CDN 801-M3	LÜTHI	22/24/27, 15C, 15B
2180	Digital Radio Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
2188	Preamplifier	AFS4-00100300-20-23P-6	MITEQ	22/24/27, 15C, 15B
2330	EMI Test receiver	ESIB26	R&S	22/24/27, 15C, 15B
2334	GPIB Switch 2 to 1	-	National Instruments	22/24/27, 15C, 15B
2348	Yaesu controller	G-1000DXC	YAESU	22/24/27, 15C, 15B
2349	Computer controller (Yaesu)	GS-232B	YAESU	22/24/27, 15C, 15B
2350	Preamplifier	AMF-6D-020180-29-20P	MITEQ	22/24/27, 15C
2361	Anechoic chamber	3 meter semi/full anechoic chamber	Euroshield	22/24/27, 15C, 15B
2398	Horn antenna	HF906	R&S	22/24/27, 15C
2363	Band Reject Filter	WRCG 832/838-825/845/5SS	Wainwright	22/24/27
2364	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	22/24/27
2365	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
2366	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
2384	Band Reject Filter	WRCG832/838-825/845-40/5SS	Wainwright	22/24/27
2388	Bluetooth Tester	CBT	R&S	15C, 15B
-	RF Emission Software	ES-K1 v.1.71	R&S	22/24/27, 15C, 15B

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