FCC Part 22/24/27 Compliance Test Report

Test Report no.:	FCC22&24&27_RM-511_09.doc	**Date of Report:**	21-Aug-2009
Number of pages:	9	**Customer's Contact person:**	Ralph Schwarz
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	**Customer:**	Nokia Corporation Lise Meitner Strasse 10 89081 ULM GERMANY Tel. +49 731 1754 0 Fax. +49 731 1754 6800
FCC listing no.: **IC recognition no.:**	94436 661AK-1		
Tested devices/ accessories:	**Phone RM-511 / Battery BL-4S**		
FCC ID:	PPIRM-511	**IC:**	661U-RM511
Supplement reports:	-		
Testing has been carried out in accordance with:	**CFR 47, FCC rules Parts 22, 24 and 27, TIA-603-C-2004 and IC standards RSS-GEN (Issue 2, June 2007), RSS-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009) and RSS-139 (Issue 2, February 2009). 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: 2009.08.21 12:33:16 +03'00'		

Sami Lehtonen, System Specialist EMC

1. Summary for FCC Part 22/24/27 Compliance Test Report

Date of receipt	17-Aug-2009
Testing completed	18-Aug-2009
The customer's contact person	Ralph Schwarz
Test Plan referred to	T:\Projects\RM-509\TestPlan_RS\RS_testplan_RM-509.xls
Notes	-
Document name	FCC22&24&27_RM-511_09.doc

1.1. EUT and Accessory Information

The EUT is a 7-band (GSM850/900/1800/1900 and WCDMA Band I/IV(1700)/VIII) mobile phone with GPRS, EGPRS and Bluetooth. The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-509	004401106655455	0510	-	3.08	41987
Battery	BL-4S	393213848626022508l;0670577	-	-	-	41986

1.2. Summary of Test Results

GSM 850:

Section in CFR 47	Section in *RSS-GEN* or RSS-132	Name of the test	Result
§2.1046(a), 22.913(a)	4.4	Conducted RF output power	NP
§22.913(a)	4.4	Radiated RF output power	PASSED
§2.1049(h)	*4.6.1*	99 % occupied bandwidth	NP
§22.917(a)	4.5	Band edge compliance	NP
§22.917(a), §2.1051	4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	4.5	Spurious radiated emissions	NP
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

GSM 1900:

Section in CFR 47	Section in *RSS-GEN* or RSS-133	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§24.232(b)	6.4	Radiated RF output power	PASSED
§2.1049(h)	*4.6.1*	99 % occupied bandwidth	NP
§24.238(a)	6.5	Band edge compliance	NP
§24.238(a), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.5	Spurious radiated emissions	NP
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

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WCDMA 1700 (Band IV):

Section in CFR 47	Section in *RSS-GEN* or RSS-139	Name of the test	Result
§2.1046(a)	6.4	Conducted RF output power	NP
§27.50(d)(2)	6.4	Radiated RF output power	PASSED
§2.1049(h)	*4.6.1*	99 % occupied bandwidth	NP
§27.53(g)	6.5	Band edge compliance	NP
§27.53(g), §2.1051	6.5	Spurious emissions at antenna terminals	NP
§27.53(g), §2.1053	6.5	Spurious radiated emissions	NP
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	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 Tampere Laboratory.

"*The test results of* PPIRM-509 *are re-used for certification of the* PPIRM-511*. The table above indicates the results, which will be re-used."*

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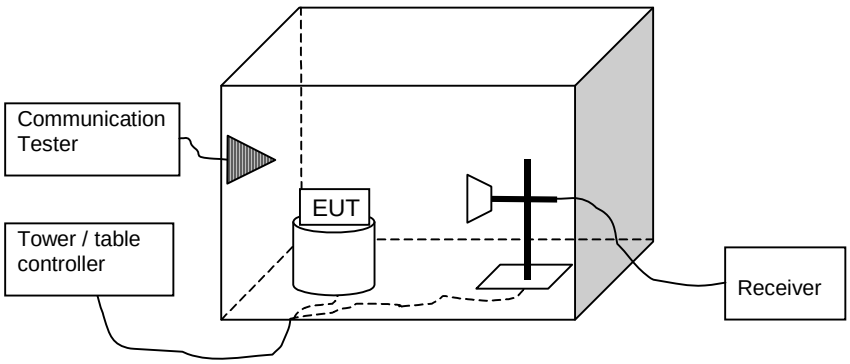
2. Radiated RF output power

(FCC §22.913(a), §24.232(b), §27.50(d)(2), RSS-132 4.4, RSS-133 6.4, RSS-139 6.4)

EUT with DUT number	RM-509 DUT 41987
Accessories with DUT numbers	BL-4S DUT 41986
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Flip open/closed
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 50 / 100.4
Date of measurements	17-Aug-2009
Measured by	Jari Jantunen

2.1. Test setup



2.2. Test method and limit

The measurement is made according to TIA-603-C-2004 as follows:

The measurement is performed in the Anechoic Chamber with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system. The turntable is rotated 360 degrees and this is repeated for both horizontal and vertical receive antenna polarizations.

The EUT is placed on a nonconductive plate at 170 cm height.

The substitution method is used. Substitution values at each frequencies are measured beforehand and saved to the test software.

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The substitution corrections are obtained as described below:

$$A_{SUBST} = P_{SUBST\_TX} - P_{SUBST\_RX} - L_{SUBST\_CABLES} + G_{SUBST\_TX\_ANT}$$

Where A_{SUBST} is the final substitution correction including receive antenna gain. P_{SUBST_TX} is signal generator level, P_{SUBST_RX} is receiver level, L_{SUBST_CABLES} is cable losses including both TX and RX cables and $G_{SUBST\_TX\_ANT}$ is substitution antenna gain.

The measurement results are obtained as described below:

$$P\ [dBm] = P_{MEAS} + A_{TOT}$$

Where P_{MEAS} is receiver reading in dBm and A_{TOT} is total correction factor including cable loss and substitution correction ($A_{TOT} = L_{CABLES} + A_{SUBST}$).

Limits for radiated RF output power measurements

Frequency range [MHz]	Limit [W]	Limit [dBm]
824 - 849	7	38.5
1710 - 1755	1	30
1850 - 1910	2	33

2.3. GSM 850 Test results / Flip open

GSM mode

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
128 / 824.2	29.60	0.912	- 5.00	34.60	VERTICAL	PASSED
190 / 836.6	30.20	1.047	- 3.10	33.30	VERTICAL	PASSED
251 / 848.8	30.30	1.072	- 2.50	32.80	VERTICAL	PASSED

EGPRS mode, 1 TX Slot

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
128 / 824.2	20.70	0.117	- 13.90	34.60	VERTICAL	PASSED
190 / 836.6	21.20	0.132	- 12.10	33.30	VERTICAL	PASSED
251 / 848.8	20.80	0.120	- 12.00	32.80	VERTICAL	PASSED

2.4. GSM 1900 Test results / Flip open

GSM mode

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
512 / 1850.2	30.50	1.122	- 12.00	42.50	VERTICAL	PASSED
661 / 1880.0	31.00	1.259	- 11.50	42.50	HORIZONTAL	PASSED
810 / 1909.8	31.00	1.259	- 11.80	42.80	HORIZONTAL	PASSED

EGPRS mode, 1 TX Slot

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
512 / 1850.2	25.80	0.380	- 16.70	42.50	VERTICAL	PASSED
661 / 1880.0	26.40	0.437	- 16.10	42.50	HORIZONTAL	PASSED
810 / 1909.8	26.90	0.490	- 15.90	42.80	HORIZONTAL	PASSED

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2.5. WCDMA 1700 Test results / Flip open

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
1312 / 1712.4	21.90	0.155	- 19.70	41.60	VERTICAL	PASSED
1412 / 1732.4	22.80	0.191	- 19.20	42.00	VERTICAL	PASSED
1513 / 1752.6	21.00	0.126	- 21.10	42.10	VERTICAL	PASSED

2.6. GSM 850 Test results / Flip closed

GSM mode

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
128 / 824.2	25.90	0.389	- 8.70	34.60	VERTICAL	PASSED
190 / 836.6	25.50	0.355	- 7.80	33.30	VERTICAL	PASSED
251 / 848.8	26.10	0.407	- 6.70	32.80	VERTICAL	PASSED

EGPRS mode, 1 TX Slot

Channel / f_C [MHz]	ERP [dBm]	ERP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
128 / 824.2	16.30	0.043	- 18.30	34.60	VERTICAL	PASSED
190 / 836.6	16.60	0.046	- 16.70	33.30	VERTICAL	PASSED
251 / 848.8	16.40	0.044	- 16.40	32.80	VERTICAL	PASSED

2.7. GSM 1900 Test results / Flip closed

GSM mode

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
512 / 1850.2	28.30	0.676	- 13.30	41.60	HORIZONTAL	PASSED
661 / 1880.0	30.00	1.000	- 12.50	42.50	HORIZONTAL	PASSED
810 / 1909.8	30.00	1.000	- 12.80	42.80	HORIZONTAL	PASSED

EGPRS mode, 1 TX Slot

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
512 / 1850.2	22.80	0.191	- 18.80	41.60	HORIZONTAL	PASSED
661 / 1880.0	25.20	0.331	- 17.30	42.50	HORIZONTAL	PASSED
810 / 1909.8	26.00	0.398	- 16.80	42.80	HORIZONTAL	PASSED

2.8. WCDMA 1700 Test results / Flip closed

Channel / f_C [MHz]	EIRP [dBm]	EIRP [W]	P_{MEAS} [dBm]	A_{TOT} [dB]	Polarisation	Result
1312 / 1712.4	22.10	0.162	- 19.50	41.60	VERTICAL	PASSED
1412 / 1732.4	22.10	0.162	- 19.90	42.00	VERTICAL	PASSED
1513 / 1752.6	21.10	0.129	- 21.00	42.10	VERTICAL	PASSED

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3. Test equipment

3.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30597	Power splitter	11667A	Agilent	22/24/27, 15C
TM37499	Power splitter	11667A	Agilent	22/24/27, 15C
TM38111	Multimeter	34401A	Agilent	22/24/27, 15C
TM38112	DC power supply	6632A	Agilent	22/24/27, 15C
TM22901	Attenuator	8496A	Agilent	22/24/27, 15C
TM30636	Artificial mains net	L2-16	PMM	15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM30600	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum analyzer	FSU	R&S	22/24/27, 15C
TM22835	Multimeter	87	Fluke	15C, 15B
TM37500	Microwave switch system	7116-MSW	Keithley	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transformatic	22/24/27, 15C, 15B
	Temperature chamber	VT4002	Vötsch	22/24/27, 15C
2058	EMI Test receiver	ESPC	R&S	15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B

3.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30599	3m semi-anechoic chamber		TDK	22/24/27, 15C, 15B
TM38845	EMI receiver	ESI 40	R&S	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	MITEQ	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	MITEQ	22/24/27, 15C, 15B
TM37516	Biconilog antenna	HL562	R&S	22/24/27, 15C, 15B
TM26496	Double ridged waveguide antenna	3115	EMCO	22/24/27, 15C, 15B
TM39158	Horn antenna	3116	EMCO	22/24/27, 15C, 15B
TM26492	Reference dipole set	UHAP/VHAP	Schwarzbeck	22/24/27, 15C, 15B
TM37501	Dipole antenna	3125-870	EMCO	22/24/27
TM37502	Dipole antenna	3125-1880	EMCO	22/24/27
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM38631	Signal generator	83640L	Agilent	22/24/27, 15C, 15B
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	22/24/27, 15C, 15B
TM26511	Tunable notch filter	WRCA870	Wainwright	22/24/27
TM38215	Tunable notch filter	WRCD1850/1910-0.2/40	Wainwright	22/24/27
TM38214	Band reject filter	WRCT 2402/2480-2400/2483.5-30	Wainwright	15C
TM30642	Mast/Turntable controller	HD-100	Deisel	22/24/27, 15C, 15B
TM26500	Turntable	DS412	Deisel	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	EMCO	22/24/27, 15C, 15B
TM38843	Antenna mast	2075	EMCO	22/24/27, 15C, 15B
TM38114	DC power supply	6632A	Agilent	22/24/27, 15C, 15B
TM38323	Preamplifier	PA-02 18-26 GHz	EMC Automation	22/24/27, 15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transformatic	22/24/27, 15C, 15B
TM23892	Yaesu controller	G-1000SDX	Yaesu	22/24/27, 15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B

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Eq. No	Equipment	Type	Manufacturer	Used in
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B

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