

FCC Part 22/24 Compliance Test Report

Test Report no.:	FCC22&24_RM-648_09.doc	Date of Report:	19-Apr-2010
Number of pages:	10	Customer's Contact person:	Mohammad El-haj
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FCC listing no.:	99059		
IC recognition no.:	661AL-1		
Tested devices/ accessories:	Phone RM-648 / Battery BL-5F / AC-Charger AC-6E / Headset WH-102		
FCC ID:	QTKRM-648	IC:	661AD-RM648
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 22 and 24, TIA-603-C-2004 and IC standards RSS-GEN (Issue 2, June 2007) and RSS-132 (Issue 2, September 2005) and RSS-133 (Issue 5, 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:			

Ruben Hansen, System Manager, EMC

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

Date of receipt	11-Mar-2010
Testing completed	16-Mar-2010
The customer's contact person	Mohammad El-haj
Test Plan referred to	T:\Projects\Projects\RM-627\TestPlan\RS_testplan_RM-627.xls
Notes	-
Document name	\\satcc01nmp\tcc_salo\Projects\RM-648\EMC\FCC22&24_RM-648_09.doc

1.1. EUT and Accessory Information

The EUT is a 7-band (GSM850/900/1800/1900) and WCDMA Band (I/II(1900)/V) mobile phone with GPRS, EGPRS, HSDPA, HSUPA and WLAN 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-627	004402130270147	0200A	-	041.005RD	24398
Battery	BL-5F	3635639366311608757;0670498	-	-	-	24368
AC-Charger	AC-6E	3943499401141210126;0675590	-	-	-	24384
Headset	WH-102	0694786945311R00419	-	-	-	24377

1.2. Summary of Test Results

GSM850:

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	NP
§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	Passed
§2.1055(a)	4.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3	Frequency stability, voltage variation	NP

GSM1900:

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	NP
§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	Passed
§2.1055(a)	6.3	Frequency stability, temperature variation	NP
§2.1055(d)	6.3	Frequency stability, voltage variation	NP

WCDMA 1900 (Band II):

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	NP
§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	Passed
§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 Laboratory.

The test results of QTKRM-627 are re-used for certification of the QTKRM-648. The tables above indicate the results, which will be re-used.

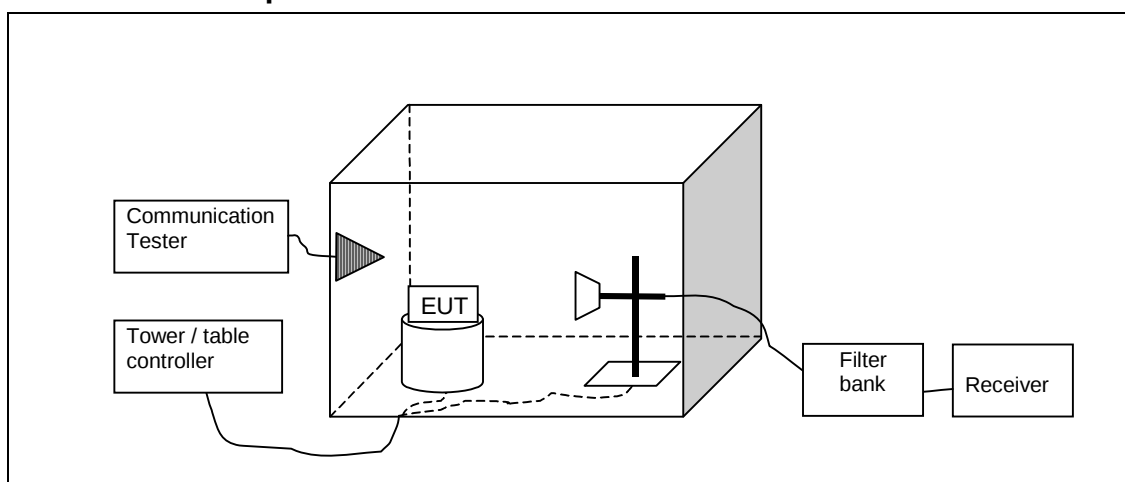
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2. Spurious radiated emissions (FCC §22.917(a), §24.238(a), §2.1053, RSS-132 4.5, RSS-133 6.5)

EUT with DUT number	RM-627, DUT 24398
Accessories with DUT numbers	BL-5F, DUT 24368 ; AC-6E, DUT 24384 ; WH-102, DUT 24377
Result	
Remarks	
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	
Date of measurements	16-Mar-2010
Measured by	Christian Andersen

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 divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on 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 substitution method is used. Substitution values at each frequencies are measured

beforehand and saved to the test software.

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 ($A_{TOT} = L_{CABLES} - G_{PREAMP} + A_{SUBST}$).

Limits for spurious radiated emissions measurements

Operation band	Frequency range [MHz]	Limit [dBm]
WCDMA 850	30 - 8500	-13
GSM 1900 / WCDMA 1700 / WCDMA 1900	30 - 18500	-13

2.3. GSM850 TX Test results

GSM mode, channel 190 / 836.6 MHz

Frequency [MHz]	P[dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
849.265	-66.88	0.00021	-63.55	-3.33	VERTICAL	Passed
1673.395	-42.73	0.05333	-47.8	5.07	VERTICAL	Passed
1673.395	-44.84	0.03281	-49.91	5.07	VERTICAL	Passed
2509.699	-37.55	0.17579	-48.56	11.01	HORIZONTAL	Passed
2509.719	-37.91	0.16181	-48.92	11.01	HORIZONTAL	Passed
6986.287	-41.43	0.07194	-61.9	20.47	VERTICAL	Passed

EGPRS mode, channel 190 / 836.6 MHz

Frequency [MHz]	P[dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
848.82	-69.72	0.00011	-66.41	-3.31	VERTICAL	Passed
1673.206	-51.43	0.00719	-56.5	5.07	VERTICAL	Passed
1673.367	-53.62	0.00435	-58.69	5.07	VERTICAL	Passed
2509.8	-48.29	0.01483	-59.3	11.01	HORIZONTAL	Passed
2510.381	-50.83	0.00826	-61.75	10.92	HORIZONTAL	Passed
6989.782	-39.84	0.10375	-60.46	20.62	VERTICAL	Passed

2.4. GSM1900 TX Test results

GSM mode, channel 661 / 1880.0 MHz

Frequency [MHz]	P[dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1947.811	-27.56	1.75388	-36.43	8.87	VERTICAL	Passed
1947.813	-27.57	1.74985	-36.44	8.87	VERTICAL	Passed
9525.611	-41.07	0.07816	-69.33	28.26	VERTICAL	Passed
9771.142	-40.73	0.08453	-68.82	28.09	HORIZONTAL	Passed
17826.573	-29.76	1.05682	-75.38	45.62	HORIZONTAL	Passed
17903.647	-29.57	1.10408	-76.53	46.96	VERTICAL	Passed

*1947.8 MHz frequency is coming from communication tester and thus ignored.

EGPRS mode, channel 661 / 1880.0 MHz

Frequency [MHz]	P[dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1947.14	-53.35	0.00462	-62.23	8.88	VERTICAL	Passed
1959.126	-31.79	0.66222	-41.02	9.23	VERTICAL	Passed
9543.347	-41.95	0.06383	-69.58	27.63	VERTICAL	Passed
9767.715	-41.13	0.07709	-69.46	28.33	HORIZONTAL	Passed
17849.158	-29.81	1.04472	-75.84	46.03	HORIZONTAL	Passed
17898.778	-29.67	1.07895	-76.77	47.1	VERTICAL	Passed

*1947.8 MHz frequency is coming from communication tester and thus ignored.

2.5. WCDMA2 TX Test results

Channel 9400 / 1880.0 MHz

Frequency [MHz]	P[dBm]	P [μ W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
1848.509	-50.83	0.00826	-58.96	8.13	VERTICAL	Passed
1848.935	-50.36	0.0092	-58.5	8.14	VERTICAL	Passed
1959.539	-34.74	0.33574	-43.62	8.88	VERTICAL	Passed
1961.114	-34.73	0.33651	-43.59	8.86	VERTICAL	Passed
17902.004	-27.95	1.60325	-76.24	48.29	HORIZONTAL	Passed
17984.593	-27.98	1.59221	-77.31	49.33	HORIZONTAL	Passed

3. Test Equipment

3.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15C, 15B
13037	Power Supply 0-15V 10A	EA3012	LP Instruments	15C, 15B
13513	Pulse Limiter	ESH3Z2	Rohde&Schwarz	15C, 15B
13666	Receiver	ESPC	Rohde&Schwarz	15C, 15B
13935	LISN	ESH3-Z5	Rohde&Schwarz	15C, 15B
16995	Directional Coupler 20dB 0,5-2,0	1538RA-20	Weinschel	15C, 15B
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15C, 15B
19171	Communication Tester	CMU200	Rohde&Schwarz	15C, 15B
11386	DC Power Supply	HP6632A	Hewlett Packard	22/24/27, 15C, 15B
19678	Spectrum Analyzer	FSP	Rohde&Schwarz	22/24/27, 15C, 15B
16601	Communication Tester	CMU200	Rohde&Schwarz	22/24/27, 15C, 15B
19625	Climatic Chamber	VT4002EMC	Vötsch	22/24/27, 15C, 15B
13357	Signal Generator	SMP02	Rohde&Schwarz	22/24/27, 15C, 15B
19116	Power splitter	-	various	22/24/27, 15C, 15B
20544	Transformer. 230/115V	-	Nokia	22/24/27, 15C, 15B
20543	UPS. 700V/A 490W	PW 9120 700i	Powerware	22/24/27, 15C, 15B

3.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
18416	Communication Tester	CMU200	Rohde&Schwarz	22/24/27, 15C, 15B
20168	Bluetooth Tester	CBT	Rohde&Schwarz	22/24/27, 15C, 15B
13077	Power Supply	EA-3016	-	22/24/27, 15C, 15B
15742	Programmable Relay Switching	-----	Pickering	22/24/27, 15C, 15B
20078	Relay 2x6 Chnl μ Wave Mux	10-785B-522	Pickering	22/24/27, 15C, 15B
14021	Relay Dual 6 Chnl μ Wave Mux	10-785-522	-	22/24/27, 15C, 15B
-	Relay Dual 6 Chnl μ Wave Mux	10-785-522	-	22/24/27, 15C, 15B
17644	Dual 6 Channel MUX Microwave	10-785-522	Pickering	22/24/27, 15C, 15B
16948	Dual 6 Channel MUX Microwave	10-785-522	Pickering	22/24/27, 15C, 15B
16949	Dual 6 Channel MUX Microwave	10-785-522	Pickering	22/24/27, 15C, 15B
18861	Receiver	EMI Test Receiver	Rohde&Schwarz	22/24/27, 15C, 15B
18860	Antenna	HL562	Rohde&Schwarz	22/24/27, 15C, 15B
18773	Anechoic chamber	RFD-100	ETS-Lindgren	22/24/27, 15C, 15B
18774	Anechoic chamber	RFSD-F/A-100	ETS-Lindgren	22/24/27, 15C, 15B
19151	High Pass Filter	WHJS3000-10SS	Wainwright	22/24/27, 15C, 15B
13937	Band reject filter	WRCA902.4-0.2/40-	Wainwright	22/24/27, 15C, 15B
13936	Band reject filter	WRCD1747.5-0.2/40-	Wainwright	22/24/27, 15C, 15B
14114	Highpass Filter	WHK1000-12SS	Wainwright	22/24/27, 15C, 15B
14188	Band reject filter	WRCA902.4-0.2/40-	Wainwright	22/24/27, 15C, 15B
14187	Band reject filter	WRCD1747.5-0.2/40-	Wainwright	22/24/27, 15C, 15B
16633	Band reject filter	WRCD1880.0-0.2/40-	Wainwright	22/24/27, 15C, 15B
19587	Band reject filter	WRCG2400/2483-	Wainwright	22/24/27, 15C, 15B
20115	Band reject filter	-	Wainwright	22/24/27, 15C, 15B
20114	Band reject filter	WRCG1737/1743-	Wainwright	22/24/27, 15C, 15B
20116	Band reject filter	WRCG832/83/-	Wainwright	22/24/27, 15C, 15B
-	Antenna	BBHA 9120 D	SCHWARZBECK	22/24/27, 15C, 15B
19966	Antenna	HFH2-Z2	Rohde&Schwarz	15C, 15B
13799	Signal Generator	SMP02	Rohde&Schwarz	22/24/27, 15C, 15B
15191	Turntable Contoller Unit	G-800SDX	YAESU	22/24/27, 15C, 15B

14900	Antenna Controller	HD100	HD GmbH	22/24/27, 15C, 15B
20544	Transformer. 230/115V	-	Nokia	22/24/27, 15C, 15B
20543	UPS. 700V/A 490W	PW 9120 700i	Powerware	22/24/27, 15C, 15B