

FCC Part 22/24 Compliance Test Report

Test Report no.:	Tre_FCC_0529_01.doc	Date of Report:	2.8.2005
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FCC listing no.:	94436		
IC recognition no.:	3608		
Tested devices/ accessories:	GSM phone RM-77 / Battery BL-4C, AC charger AC-3, Headset HS-23		
FCC ID:	PPIRM-77H	IC:	661U-RM77H
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Parts 22 and 24, TIA-603-B-2002 and IC standards RSS-132 and RSS-133. 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 Jan-Erik Lilja
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Reason: I am approving this document
Date: 2005.08.02 14:34:43 +03'00'

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

Date of receipt	18.7.2005
Testing completed	18.7.2005
The customer's contact person	Thomas Reitmayer
Test Plan referred to	\\EMC\TESTPLANS\EMC\TCC\HDJ12_RM77_official_EMG_test_plan.xls
Notes	-
Document name	T:\Projects\RM-77\results\emc\FCC\Tre_FCC_0529_01.doc

1.1. EUT and Accessory Information

The EUT is a triple band (GSM850/1800/1900) mobile phone with GPRS and EGPRS. The EUT is tested with maximum rated TX power, modulated with pseudo random bit sequence (PRBS9).

Product	Type	SN	HW	MV	SW	DUT
GSM phone	RM-77	356642000000033	5010	-	3.37	40305
Battery	BL-4C	L425A10267915	-	-	-	40306
AC Charger	AC-3	-	1.1	0.3		40239
Headset	HS-23	-	0.6	0.4	0.2	40224

1.2. Summary of Test Results

GSM 850:

Section in CFR 47	Section in 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, 6.4	Radiated RF output power	PASSED
§2.1049(h)	4.2	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, 6.3	Frequency stability, temperature variation	NP
§2.1055(d)	4.3, 6.3	Frequency stability, voltage variation	NP

GSM 1900:

Section in CFR 47	Section in RSS-133	Name of the test	Result
§2.1046(a)	6.2	Conducted RF output power	NP
§24.232(b)	6.2	Radiated RF output power	PASSED
§2.1049(h)	5.6	99 % occupied bandwidth	NP
§24.238(a)	6.3	Band edge compliance	NP
§24.238(a), §2.1051	6.3	Spurious emissions at antenna terminals	NP
§24.238(a), §2.1053	6.3	Spurious radiated emissions	NP
§2.1055(a)	7	Frequency stability, temperature variation	NP
§2.1055(d)	7	Frequency stability, voltage variation	NP

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 Tampere Laboratory.

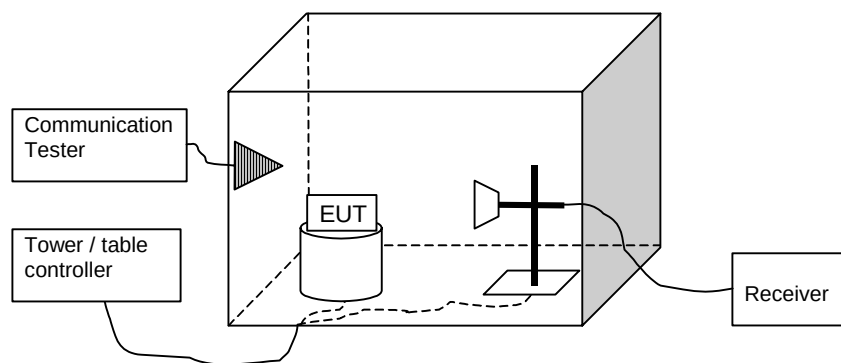
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2. Radiated RF output power (FCC §22.913(a), §24.232(b), RSS-132 6.4, RSS-133 6.2)

EUT with DUT number	RM-77 DUT 40305
Accessories with DUT numbers	BL-4C DUT 40306, AC-3 DUT , HS-23 DUT
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Measured both flip open and flip closed
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 41 / 100.7
Date of measurements	18.7.2005
Measured by	Jari Jantunen

2.1. Test setup



2.2. Test method and limit

The measurement is made according to TIA-603-B-2002 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.

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
1850 - 1910	2	33

2.3. GSM 850 Test results

Flip open
GSM mode

Channel	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
128	31.40	1.380	- 1.60	33.00	HORIZONTAL	PASSED
190	30.50	1.122	- 1.30	31.80	HORIZONTAL	PASSED
251	31.40	1.380	- 0.70	32.10	HORIZONTAL	PASSED

GPRS mode, 2 TX Slots

Channel	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
128	26.70	0.468	- 6.30	33.00	HORIZONTAL	PASSED
190	26.00	0.398	- 5.80	31.80	HORIZONTAL	PASSED
251	27.10	0.513	- 5.00	32.10	HORIZONTAL	PASSED

EGPRS mode, 1 TX Slot

Channel	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
128	27.70	0.589	- 5.30	33.00	HORIZONTAL	PASSED
190	27.40	0.550	- 4.40	31.80	HORIZONTAL	PASSED
251	28.40	0.692	- 3.70	32.10	HORIZONTAL	PASSED

Flip closed
GSM mode

Channel	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
128	31.30	1.349	- 1.70	33.00	HORIZONTAL	PASSED
190	31.00	1.259	- 0.80	31.80	HORIZONTAL	PASSED
251	31.50	1.413	- 0.60	32.10	HORIZONTAL	PASSED

GPRS mode, 2 TX Slots

Channel	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
128	27.30	0.537	- 5.70	33.00	HORIZONTAL	PASSED
190	26.90	0.490	- 4.90	31.80	HORIZONTAL	PASSED
251	27.20	0.525	- 4.90	32.10	HORIZONTAL	PASSED

EGPRS mode, 1 TX Slot

Channel	ERP [dBm]	ERP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
128	27.70	0.589	- 5.30	33.00	HORIZONTAL	PASSED
190	27.80	0.603	- 4.00	31.80	HORIZONTAL	PASSED
251	28.00	0.631	- 4.10	32.10	HORIZONTAL	PASSED

2.4. GSM 1900 Test results

Flip open
GSM mode

Channel	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
512	32.10	1.622	- 11.30	43.40	HORIZONTAL	PASSED
661	30.30	1.072	- 11.40	41.70	HORIZONTAL	PASSED
810	30.50	1.122	- 12.50	43.00	VERTICAL	PASSED

GPRS mode, 2 TX Slots

Channel	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
512	31.80	1.514	- 11.60	43.40	HORIZONTAL	PASSED
661	30.20	1.047	- 11.50	41.70	HORIZONTAL	PASSED
810	30.90	1.230	- 12.10	43.00	VERTICAL	PASSED

EGPRS mode, 1 TX Slot

Channel	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
512	31.20	1.318	- 12.20	43.40	HORIZONTAL	PASSED
661	29.70	0.933	- 12.00	41.70	HORIZONTAL	PASSED
810	30.40	1.096	- 11.70	42.10	HORIZONTAL	PASSED

Flip closed
GSM mode

Channel	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
512	32.70	1.862	- 10.60	43.30	VERTICAL	PASSED
661	31.60	1.445	- 11.50	43.10	VERTICAL	PASSED
810	30.90	1.230	- 11.20	42.10	HORIZONTAL	PASSED

GPRS mode, 2 TX Slots

Channel	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
512	32.30	1.698	- 11.00	43.30	VERTICAL	PASSED
661	31.80	1.514	- 11.30	43.10	VERTICAL	PASSED
810	31.00	1.259	- 11.10	42.10	HORIZONTAL	PASSED

EGPRS mode, 1 TX Slot

Channel	EIRP [dBm]	EIRP [W]	P _{MEAS} [dBm]	A _{TOT} [dB]	Polarisation	Result
512	31.70	1.479	- 11.60	43.30	VERTICAL	PASSED
661	31.00	1.259	- 12.10	43.10	VERTICAL	PASSED
810	30.40	1.096	- 11.70	42.10	HORIZONTAL	PASSED

3. Test Equipment

3.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM37610	Spectrum analyzer	FSU	R&S	15C,22/24
TM37678	Radio communication tester	CMU-200	R&S	15C,22/24
	Attenuator 10 dB	6251.17.A	Huber+Suhner AG	15C,22/24
TM22901	Step attenuator 110dB	8496A	Agilent	15C,22/24
TM37499	Power splitter	11667A	Agilent	15C,22/24
	Temperature chamber	VT4002	Vötsch	15C,22/24
TM38112	DC power supply	6632A	Agilent	15C,22/24
TM38111	Multimeter	34401A	Agilent	15C,22/24
TM38845	EMI receiver	ESI 40	R&S	15B,15C
TM37773	Radio communication tester	CMU-200	R&S	15B,15C
TM38631	Signal generator	83640L	Agilent	15B,15C
TM38114	DC power supply	6632A	Agilent	15B,15C
TM22835	Multimeter	87	Fluke	15B,15C
TM30600	Pulse Limiter	ESH3-Z2	R&S	15B,15C
TM26490	LISN 50 µH	ESH3-Z5/	R&S	15B,15C
TM30636	LISN 50 µH	L2-16/	PMM	15B,15C

3.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30599	3m semi-anechoic chamber		TDK	15B,15C, 22/24
TM38845	EMI receiver	ESI 40	R&S	15B,15C, 22/24
TM37498	Preamplifier	AMF-5D-020180-26-10P	MITEQ	15B,15C, 22/24
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	MITEQ	15B,15C, 22/24
TM37516	Biconilog antenna	HL562	R&S	15B,15C, 22/24
TM26496	Double ridged waveguide antenna	3115	EMCO	15B,15C, 22/24
TM39158	Horn antenna	3116	EMCO	15B,15C, 22/24
TM26492	Reference dipole set	UHAP/VHAP	Schwarzbeck	15B,15C, 22/24
TM37501	Dipole antenna	3125-870	EMCO	22/24
TM37502	Dipole antenna	3125-1880	EMCO	22/24
TM37773	Radio communication tester	CMU-200	R&S	15B,15C, 22/24
TM38631	Signal generator	83640L	Agilent	15B,15C, 22/24
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	15B,15C, 22/24
	High pass filter	WHK2010-10SS	Trilithic	15B,15C, 22/24
	Low pass filter	WLK1750-10SS	Trilithic	15B,15C, 22/24
TM26511	Tunable notch filter	WRCA870	Wainwright	22/24
TM38215	Tunable notch filter	WRCD1850/1910-0.2/40	Wainwright	22/24
TM38214	Band reject filter	WRCT 2402/2480-2400/2483.5-30	Wainwright	15C
TM30642	Turntable controller	HD-100	Deisel	15B,15C, 22/24
TM26500	Turntable	DS412	Deisel	15B,15C, 22/24
TM38842	Antenna mast controller	2090	EMCO	15B,15C, 22/24
TM38843	Antenna mast	2075	EMCO	15B,15C, 22/24
TM38114	DC power supply	6632A	Agilent	15B,15C, 22/24
TM22835	Multimeter	87	Fluke	15B,15C, 22/24