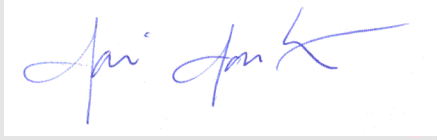
TCC Nokia

FINAS Finnish Accreditation Service T117 (EN ISO/IEC 17025)

FCC Part 22/24 Compliance Test Report

Test Report no.:	Tre_FCC_0629_03.doc	**Date of Report:**	23.8.2006
Number of pages:	10	**Customer's Contact person:**	Jorma Hanni
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 P.O. Box 300 Yrttipellontie 6 FIN-90230 OULU, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 58300
FCC listing no.: **IC recognition no.:**	94436 3608		
Tested devices/ accessories:	**GSM phone RM-198 / Dummy battery BTD-8, Headset HS-5**		
FCC ID:	LJPRM-198	**IC:**	661E-RM198
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-GEN, 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 Jari Jantunen Date: 2006.08.23 14:16:10 +03'00'		

Jari Jantunen, System Manager

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

Date of receipt	12.7.2006
Testing completed	22.8.2006
The customer's contact person	Jorma Hanni
Test Plan referred to	\EMC\TESTPLAN\
Notes	-
Document name	T:\Projects\RM-198\EMC\Results\FCC\Tre_FCC_0629_03.doc

1.1. EUT and Accessory Information

The EUT is a quadri band (GSM850/900/1800/1900) 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
GSM phone	RM-198	004400871669931	1101	-	3.11	**40768**
Dummy Battery	BTD-8	-	-	-	-	**40772**
Headset	HS-5	-	-	-	-	**40760**

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)	*4.6*, 4.4	Conducted RF output power	NP
§22.913(a)	*4.6*, 4.4	Radiated RF output power	NP
§2.1049(h)	*4.4.1*	99 % occupied bandwidth	PASSED
§22.917(a)	*4.7*, 4.5	Band edge compliance	NP
§22.917(a), §2.1051	*4.7*, 4.5	Spurious emissions at antenna terminals	NP
§22.917(a), §2.1053	*4.7*, 4.5	Spurious radiated emissions	NP
§2.1055(a)	*4.5*, 4.3	Frequency stability, temperature variation	PASSED
§2.1055(d)	*4.5*, 4.3	Frequency stability, voltage variation	PASSED

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	NP
§2.1049(h)	5.6	99 % occupied bandwidth	PASSED
§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	PASSED
§2.1055(d)	7	Frequency stability, voltage variation	PASSED

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.

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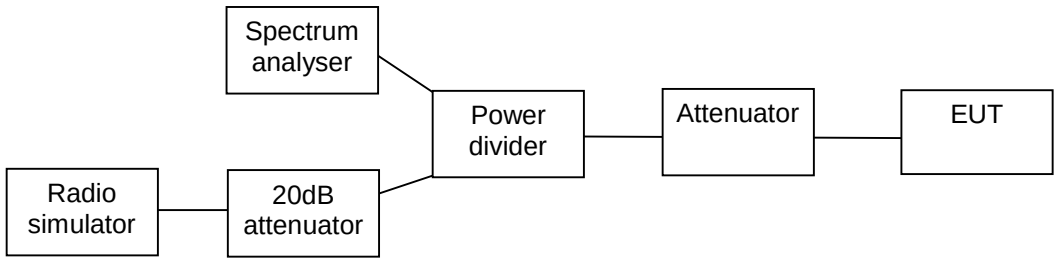
2. 99 % occupied bandwidth

(FCC §2.1049(h), RSS-GEN 4.4.1, RSS-133 5.6)

EUT with DUT number	RM-198 DUT 40768
Accessories with DUT numbers	BTD-8 DUT 40772, HS-5 DUT 40760
Operation Voltage [V] / [Hz]	3.9V DC
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	22 / 44 / 101.0
Date of measurements	22.8.2006
Measured by	Jari Jantunen

2.1. Test setup



2.2. Test method and limit

The measurement is made according to FCC rules part 22 and 24 and IC standards RSS-GEN and RSS-133.

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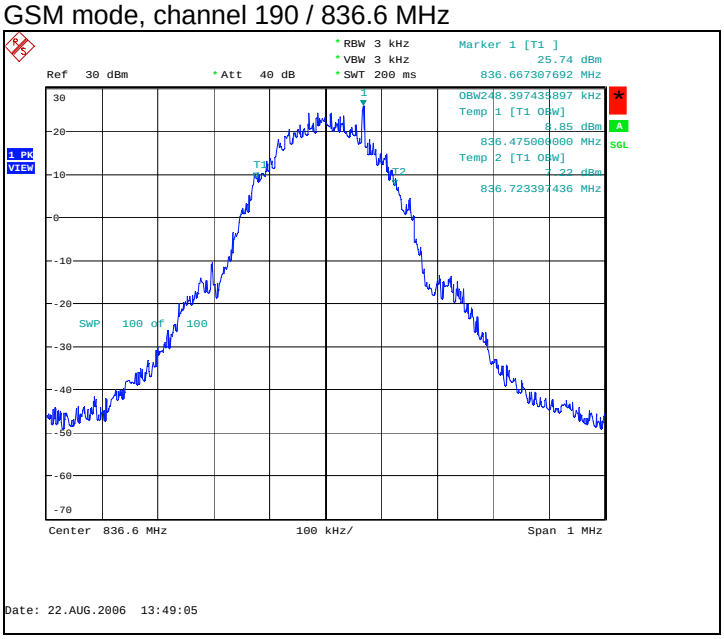
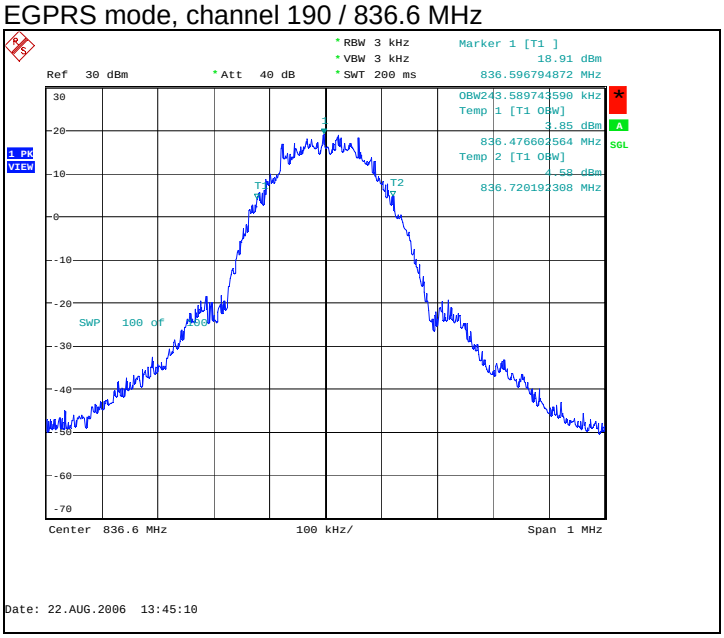
2.3. GSM 850 Test results

Operation mode (TX on)	99% occupied bandwidth [kHz]
GSM	248.397
EGPRS	243.590

GSM mode, channel 190 / 836.6 MHz



EGPRS mode, channel 190 / 836.6 MHz



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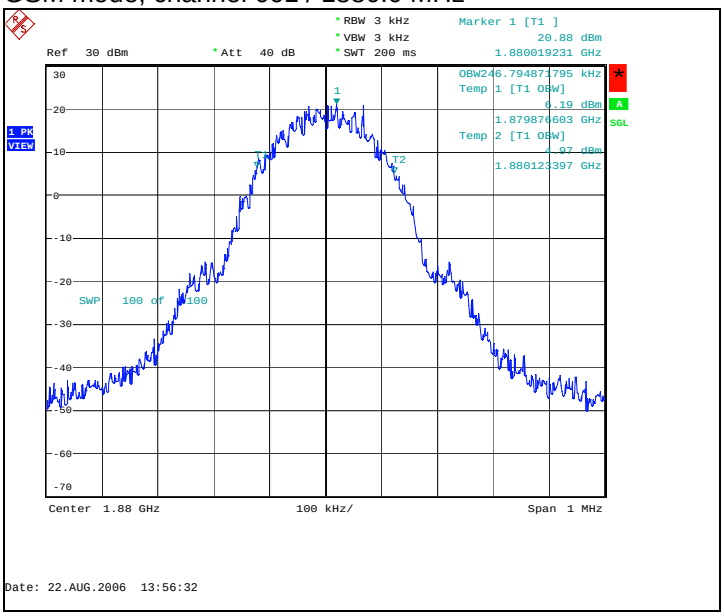
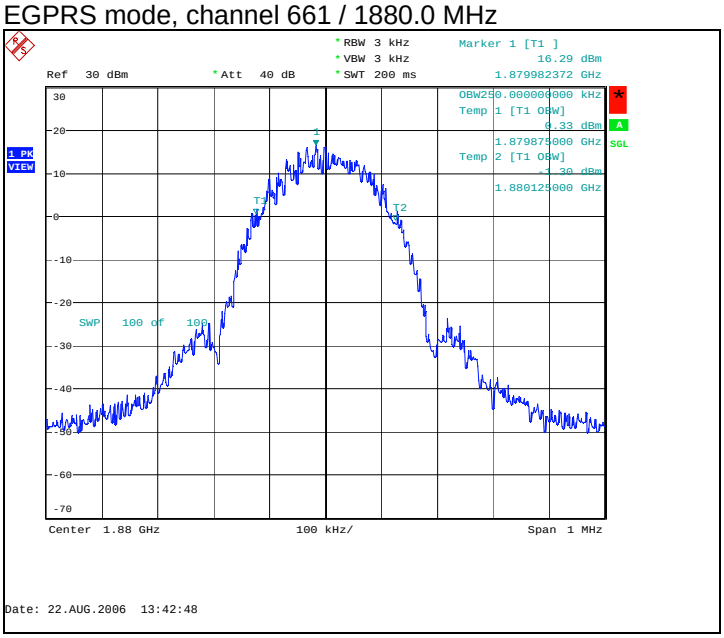
2.4. GSM 1900 Test results

Operation mode (TX on)	99% occupied bandwidth [kHz]
GSM	246.795
EGPRS	250.000

GSM mode, channel 661 / 1880.0 MHz



EGPRS mode, channel 661 / 1880.0 MHz



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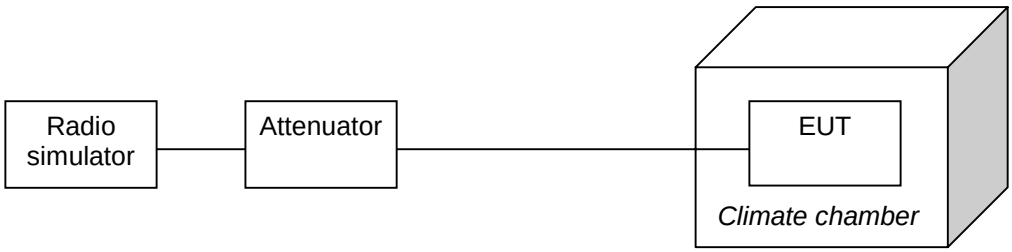
3. Frequency stability, temperature variation

(FCC §2.1055(a), §2.1055(a), RSS-GEN 4.5, RSS-132 4.3, RSS-133 7)

EUT with DUT number	RM-198 DUT 40768
Accessories with DUT numbers	BTD-8 DUT 40772, HS-5 DUT 40760
Operation Voltage [V] / [Hz]	3.9V DC
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 43 / 101.3
Date of measurements	7.8.2006
Measured by	Jari Jantunen

3.1. Test setup



3.2. Test method and limit

The measurement is made according to FCC rules part 22 and 24 and IC standards RSS-GEN, RSS-132 and RSS-133 as follows:

a) The climate chamber temperature is set to the maximum value and the temperature is allowed to stabilize.
b) The EUT is placed in the chamber.
c) The EUT is set in idle mode for 15 minutes.
d) The EUT is set to transmit.
e) The transmit frequency error was measured immediately.
f) The steps c - e were repeated for each temperature.

Limits for frequency stability, temperature variation measurements

Frequency deviation [ppm]
± 2.5

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3.3. GSM 850 Test results

GSM mode, channel 190 / 836.6 MHz

Temperature [°C]	Deviation [Hz]	Deviation [ppm]
50	-17	- 0.0203
40	-11	- 0.0131
30	-10	- 0.0120
20	10	0.0120
10	10	0.0120
0	-12	- 0.0143
-10	-13	- 0.0155
-20	-12	- 0.0143
-30	-11	- 0.0131

3.4. GSM 1900 Test results

GSM mode, channel 661 / 1880.0 MHz

Temperature [°C]	Deviation [Hz]	Deviation [ppm]
50	-47	- 0.0250
40	-51	- 0.0271
30	-52	- 0.0277
20	-33	- 0.0176
10	-41	- 0.0218
0	-27	- 0.0144
-10	-42	- 0.0223
-20	-39	- 0.0207
-30	-33	- 0.0176

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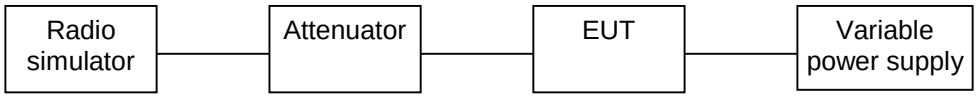
4. Frequency stability, voltage variation

(FCC §2.1055(d), RSS-GEN 4.5, RSS-132 4.3, RSS-133 7)

EUT with DUT number	RM-198 DUT 40768
Accessories with DUT numbers	BTD-8 DUT 40772, HS-5 DUT 40760
Operation Voltage [V] / [Hz]	3.4 / 3.9V DC
Result	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 43 / 101.3
Date of measurements	7.8.2006
Measured by	Jari Jantunen

4.1. Test setup



4.2. Test method and limit

The measurement is made according to FCC rules part 22 and 24 and IC standards RSS-GEN, RSS-132 and RSS-133 as follows:

The EUT battery was replaced with an adjustable power supply. The frequency stability was measured at nominal voltage and at the battery cut-off point.

Limits for frequency stability, voltage variation measurements

Frequency deviation [ppm]
± 2.5

4.3. GSM 850 Test results

GSM mode, channel 190 / 836.6 MHz

Voltage level [V]	**Deviation [Hz]**	**Deviation [ppm]**
Battery cut-off point / 3.40	-18	- 0.0215
Nominal / 3.90	-15	- 0.0179

4.4. GSM 1900 Test results

GSM mode, channel 661 / 1880.0 MHz

Voltage level [V]	**Deviation [Hz]**	**Deviation [ppm]**
Battery cut-off point / 3.40	-68	- 0.0362
Nominal / 4.00	-69	- 0.0367

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5. Test Equipment

5.1. 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

5.2. 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

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