TCC Nokia

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

FCC Part 15B Compliance Test Report

Test Report no.:	FCC15B_RM-596_09.doc	**Date of Report:**	13-Apr-2010
Number of pages:	10	**Customer's Contact person:**	Tuomo Pursiheimo
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 68 Sinitaival 5 FIN-33721 TAMPERE, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 46880
FCC listing no.: **IC recognition no.:**	94436 661AK-1		
Tested devices/ accessories:	**Phone RM-596 / Headset WH-701, AC charger AC-15E, Data cable CA-101, Laptop IBM Thinkpad T40, AC adapter 02K6543, Printer HP deskjet 1600CC3540A, Parallel cable for printer**		
FCC ID:	PDNRM-596	**IC:**	661R-RM596
Supplement reports:	-		
Testing has been carried out in accordance with:	**CFR 47, FCC rules Part 15 Subpart B, ANSI C63.4 (2003), ICES-003, CISPR 22 and IC standard 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 Jari Jantunen Date: 2010.04.13 10:46:40 +03'00'		

Jari Jantunen, System Manager, EMC

Copyright © TCC Nokia

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	08-Mar-2010
Testing completed	7-Apr-2010
The customer's contact person	Tuomo Pursiheimo
Test Plan referred to	T:\Projects\RM-596\TestPlan\RS_testplan_RM-596_2nd.xls
Notes	-
Document name	FCC15B_RM-596_09.doc

1.1. EUT and Accessory Information

The EUT is a 9-band (GSM850/900/1800/1900 and WCDMA Band I/II(1900)/IV(1700)/V(850)/VIII) mobile phone with GPRS, EGPRS, Bluetooth, WLAN and FM transmitter. GSM and WCDMA bands are tested in idle mode. Bluetooth and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-596	004402130475365	3630	-	010.008	42210
Headset	WH-701	06944289501G2R01954	-	-	-	42192
Charger	AC-15E	4090499512230700960;0675463	-	-	-	42190
Data cable	CA-101	07303849513	-	-	-	42194
Laptop	IBM Thinkpad T40	99ARTGD	-	-	-	41868
AC Adapter	02K6543	-	-	-		40202
Printer	HP deskjet 1600CC3540A	USB8302546	-	-	-	40077
Parallel cable for printer	-	-	-	-	-	40087

1.2. Summary of Test Results

WLAN:

Section in CFR 47	Section in ICES-003	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	PASSED
15.109, a	5.5	Radiated emissions	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.

Copyright © TCC Nokia
TCC Nokia Tampere Laboratory
P.O. Box 68
Sinitaival 5
FIN-33720 TAMPERE, FINLAND
Tel. +358 (0) 7180 46800
Fax. +358 (0) 7180 46880

CONTENTS

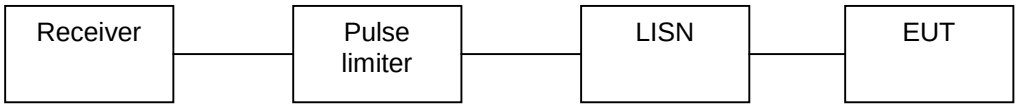
Copyright © TCC Nokia
TCC Nokia Tampere Laboratory
P.O. Box 68
Sinitaival 5
FIN-33720 TAMPERE, FINLAND
Tel. +358 (0) 7180 46800
Fax. +358 (0) 7180 46880

2. AC powerline conducted emissions

(FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RM-596 DUT42210
Accessories with DUT numbers	AC-15E DUT42190, WH-701 DUT42192, CA-101 DUT42194, IMB Thinkpad T40 DUT40202, HP deskjet 1600CC3540A DUT40077, Parallel cable for printer DUT40087
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Continuous data transfer was active between the phone and the computer during the test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 100.7
Date of measurements	07-Apr-2010
Measured by	Jari Jantunen

2.1. Test setup



2.2. Test method and limit

The measurement is made according to ANSI C63.4-2003 as follows:

The EUT is placed on a wooden table 80 cm above the reference groundplane.

The EUT is connected via LISN to a test power supply.

The measurement results are obtained as described below:

$$U\ [dB\mu V] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

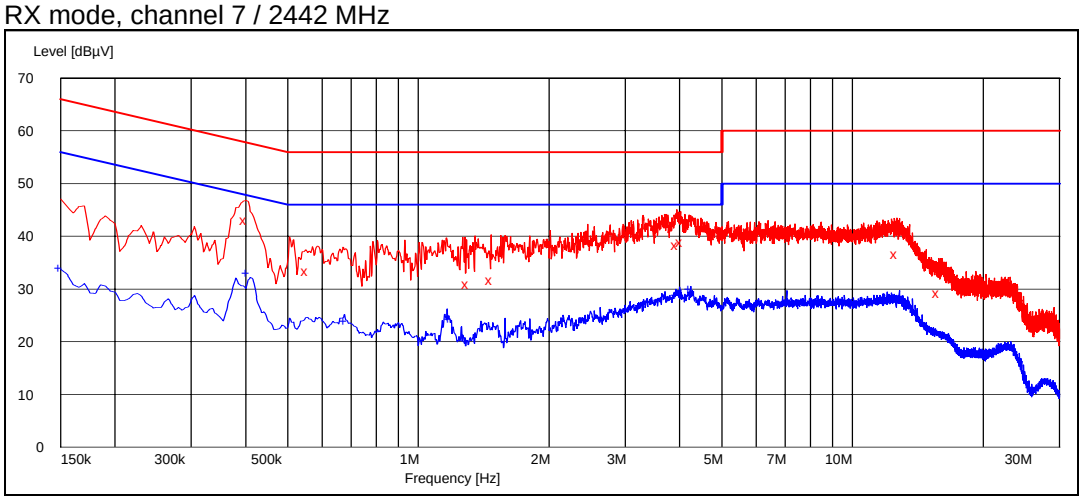
CISPR 22 Class B limits

Frequency range [MHz]	Quasi peak limit [dBµV]	Average limit [dBµV]
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

Copyright © TCC Nokia
TCC Nokia Tampere Laboratory
P.O. Box 68
Sinitaival 5
FIN-33720 TAMPERE, FINLAND
Tel. +358 (0) 7180 46800
Fax. +358 (0) 7180 46880

2.3. WLAN Test results

RX mode, channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.400000	43.10	L1	PASSED
0.555000	33.30	L1	PASSED
1.300000	30.90	L1	PASSED
1.475000	31.70	L1	PASSED
3.955000	38.30	L1	PASSED
4.050000	38.90	L1	PASSED
12.650000	36.70	L1	PASSED
15.830000	29.20	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.150000	33.90	L1	PASSED
0.405000	33.00	L1	PASSED
0.680000	23.80	L1	PASSED
1.185000	24.30	L1	PASSED
3.950000	28.80	L1	PASSED
4.240000	29.90	L1	PASSED
12.850000	27.60	L1	PASSED

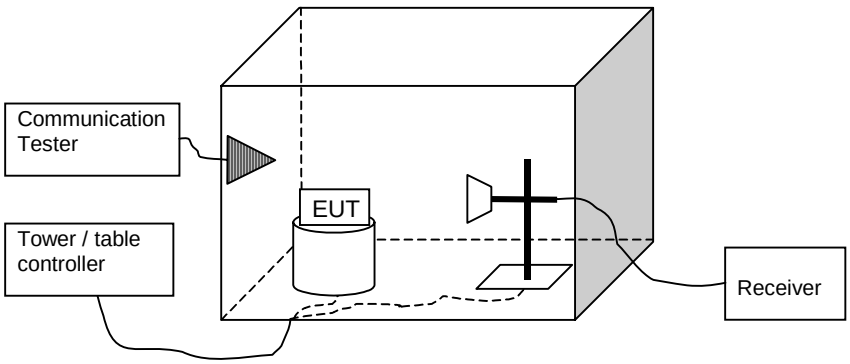
Copyright © TCC Nokia
TCC Nokia Tampere Laboratory
P.O. Box 68
Sinitaival 5
FIN-33720 TAMPERE, FINLAND
Tel. +358 (0) 7180 46800
Fax. +358 (0) 7180 46880

3. Radiated emissions

(FCC §15.109, ICES-003 section 5.5, RSS-132 4.6, RSS-133 6.6, RSS-139 6.6)

EUT with DUT number	RM-596 DUT42210
Accessories with DUT numbers	AC-15E DUT42190, WH-701 DUT42192, CA-101 DUT42194, IMB Thinkpad T40 DUT40202, HP deskjet 1600CC3540A DUT40077, Parallel cable for printer DUT40087
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Continuous data transfer was active between the phone and the computer during the test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 43 / 101.0
Date of measurements	31-Mar-2010
Measured by	Hannu Söderholm

3.1. Test setup



Copyright © TCC Nokia
TCC Nokia Tampere Laboratory
P.O. Box 68
Sinitaival 5
FIN-33720 TAMPERE, FINLAND
Tel. +358 (0) 7180 46800
Fax. +358 (0) 7180 46880

3.2. Test method and limit

The measurement is made according to ANSI C63.4-2003as follows:

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.

The EUT is placed on a nonconductive plate at 80 cm height.

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

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

Frequency range [MHz]	Quasi peak limit [dBµV/m]	Average limit [dBµV/m]	Peak limit [dBµV/m]
30 – 230	40	-	-
230 – 1000	47	-	-
Above 1000	-	54	74

Copyright © TCC Nokia
TCC Nokia Tampere Laboratory
P.O. Box 68
Sinitaival 5
FIN-33720 TAMPERE, FINLAND
Tel. +358 (0) 7180 46800
Fax. +358 (0) 7180 46880

3.3. WLAN RX + data transfer Test results

TX mode, channel 1 / 2412 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4824.000000	38.40	83.18	39.50	-1.1	HORIZONTAL	PASSED
7236.000000	42.40	131.83	39.80	2.6	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4824.000000	26.00	19.95	27.10	-1.1	VERTICAL	PASSED
7236.000000	29.90	31.26	27.30	2.6	VERTICAL	PASSED

TX mode, channel 7 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
150.000000	30.60	33.88	54.70	-24.1	VERTICAL	PASSED
170.642685	29.80	30.90	54.00	-24.2	HORIZONTAL	PASSED
256.514629	35.20	57.54	57.50	-22.3	HORIZONTAL	PASSED
400.500401	35.90	62.37	54.50	-18.6	HORIZONTAL	PASSED

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4884.000000	39.00	89.13	40.20	-1.20	HORIZONTAL	PASSED
7326.000000	43.50	149.62	40.60	2.90	HORIZONTAL	PASSED
17471.941884	52.40	416.87	33.80	18.6	VERTICAL	PASSED
17850.207415	54.90	555.90	34.20	20.7	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4884.000000	26.50	21.13	27.70	-1.20	HORIZONTAL	PASSED
7300.093186	29.90	31.26	27.00	2.9	VERTICAL	PASSED
7314.631263	30.20	32.36	27.20	3.0	VERTICAL	PASSED
17469.441884	39.40	93.33	20.80	18.6	VERTICAL	PASSED
17852.707415	42.00	125.89	21.30	20.7	VERTICAL	PASSED

TX mode, channel 11 / 2462 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4924.000000	39.50	94.41	40.60	-1.1	VERTICAL	PASSED
7386.000000	43.10	142.89	39.90	3.2	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
4924.000000	26.70	21.63	27.80	-1.1	HORIZONTAL	PASSED
7386.000000	29.80	30.90	26.60	3.2	HORIZONTAL	PASSED

Copyright © TCC Nokia
TCC Nokia Tampere Laboratory
P.O. Box 68
Sinitaival 5
FIN-33720 TAMPERE, FINLAND
Tel. +358 (0) 7180 46800
Fax. +358 (0) 7180 46880

4. Test Equipment

4.1. 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

4.2. 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
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B

Copyright © TCC Nokia
TCC Nokia Tampere Laboratory
P.O. Box 68
Sinitaival 5
FIN-33720 TAMPERE, FINLAND
Tel. +358 (0) 7180 46800
Fax. +358 (0) 7180 46880

Copyright © TCC Nokia

TCC Nokia Tampere Laboratory
P.O. Box 68
Sinitaival 5
FIN-33720 TAMPERE, FINLAND
Tel. +358 (0) 7180 46800
Fax. +358 (0) 7180 46880