

FCC Part 15B Compliance Test Report

Test Report no.:	FCC15B_RM-596_28.doc	Date of Report:	13-Apr-2010
Number of pages:	10	Customer's Contact person:	Tuomo Pursinheimo
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FCC listing no.:	94436		
IC recognition no.:	661AK-1		
Tested devices/ accessories:	Phone RM-596 / AC charger AC-15E, HDMI adapter CA-156, HDMI cable DENON, LCD TV Sony KLD-32V5500		
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:			

Jari Jantunen, System Manager, EMC

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	08-Mar-2010
Testing completed	15-Mar-2010
The customer's contact person	Tuomo Pursinheimo
Test Plan referred to	T:\Projects\RM-596\TestPlan\RS_testplan_RM-596.xls
Notes	-
Document name	FCC15B_RM-596_28.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	004402130475480	3630	-	010.008	42187
AC charger	AC-15E	4090499512230700974;0675463	-	-	-	42191
HDMI adapter	CA-156	00536	0.2	0.5	-	42195
HDMI cable	DENON	-	-	-	-	42203
LCD TV	Sony KLD-32V5500	9405885	-	-	-	42204

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.

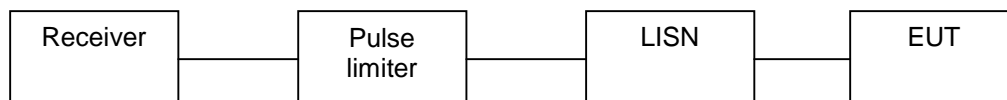
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2. AC powerline conducted emissions (FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RM-596 DUT 42187
Accessories with DUT numbers	AC-15E DUT 42191, CA-156 DUT42195, DENON DUT 42203, Sony KLD-32V5500 DUT 42204
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	WLAN in RX mode and video playing on TV using HDMI cable
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 51 / 98.6
Date of measurements	12-Mar-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:

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

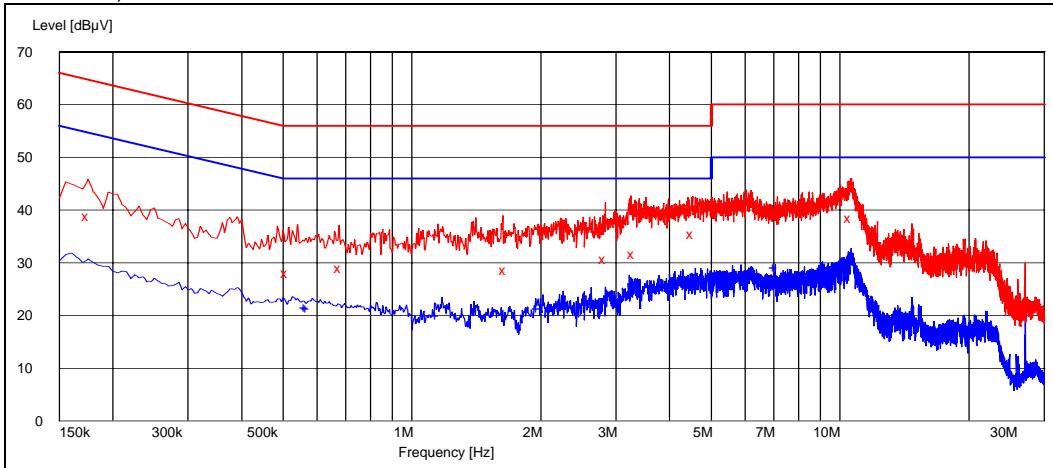
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

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

2.3. WLAN Test results + video playing on TV

RX mode, channel 7 / 2442 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.175000	38.90	L1	PASSED
0.510000	28.00	L1	PASSED
0.680000	29.00	L1	PASSED
1.655000	28.50	N	PASSED
2.825000	30.70	N	PASSED
3.290000	31.60	N	PASSED
4.530000	35.50	L1	PASSED
10.585000	38.50	L1	PASSED

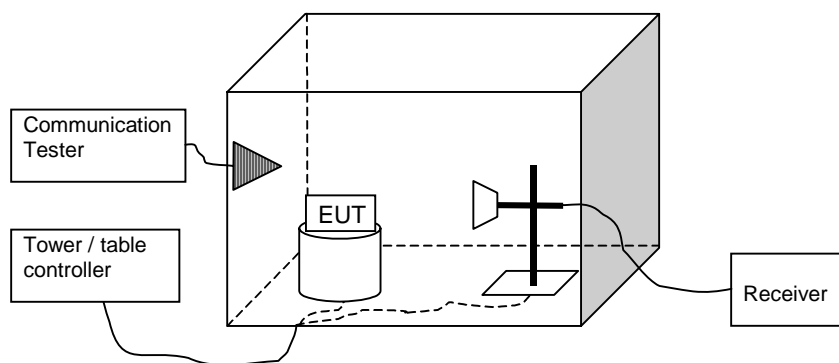
Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.565000	21.60	L1	PASSED
0.570000	21.40	L1	PASSED
1.145000	20.20	L1	PASSED
1.975000	21.50	L1	PASSED
3.215000	23.70	L1	PASSED
4.760000	26.40	L1	PASSED
7.065000	29.20	L1	PASSED
10.565000	29.10	L1	PASSED

3. Radiated emissions (FCC §15.109, ICES-003 section 5.5)

EUT with DUT number	RM-596 DUT 42187
Accessories with DUT numbers	AC-15E DUT 42191, CA-156 DUT42195, DENON DUT 42203, Sony KLD-32V5500 DUT 42204
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	WLAN in RX mode and video playing on TV using HDMI cable
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 44 / 98.4
Date of measurements	15-Mar-2010
Measured by	Jari Jantunen

3.1. Test setup



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:

$$E [\mu\text{V/m}] = U_{RX} + A_{TOT}$$

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 [dB μ V/m]	Average limit [dB μ V/m]	Peak limit [dB μ V/m]
30 – 230	40	-	-
230 – 1000	47	-	-
Above 1000	-	54	74

3.3. WLAN Test results

RX mode, channel 1 / 2412 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Polarisation	Result
4824.000000	39.50	94.41	40.60	-1.1	VERTICAL	PASSED
7236.000000	43.00	141.25	40.40	2.6	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Polarisation	Result
4824.000000	26.40	20.89	27.50	-1.1	HORIZONTAL	PASSED
7236.000000	29.90	31.26	27.30	2.6	HORIZONTAL	PASSED

RX mode, channel 7 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Polarisation	Result
40.562124	35.70	60.95	66.10	-30.40	VERTICAL	PASSED
58.276754	31.70	38.46	71.30	-39.60	VERTICAL	PASSED
196.491984	32.90	44.16	70.20	-37.30	HORIZONTAL	PASSED
379.958717	27.70	24.27	59.80	-32.10	HORIZONTAL	PASSED
582.466333	28.00	25.12	56.20	-28.20	HORIZONTAL	PASSED
699.298798	24.60	16.98	51.10	-26.50	VERTICAL	PASSED

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

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U_{RX} [dB μ V]	A_{TOT} [dB]	Polarisation	Result
4884.000000	39.20	91.20	40.40	-1.20	HORIZONTAL	PASSED
7326.000000	43.30	146.22	40.40	2.90	HORIZONTAL	PASSED
17852.205411	55.70	609.54	35.00	20.70	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
1179.358717	41.80	123.03	63.40	-21.60	VERTICAL	PASSED
1707.914830	32.30	41.21	49.80	-17.50	HORIZONTAL	PASSED
1856.213427	37.70	76.74	53.40	-15.70	VERTICAL	PASSED
1965.933868	41.80	123.03	56.60	-14.80	VERTICAL	PASSED
2359.219439	35.80	61.66	47.00	-11.20	HORIZONTAL	PASSED
2752.505010	38.80	87.10	47.00	-8.20	VERTICAL	PASSED
4884.000000	26.70	21.63	27.90	-1.20	VERTICAL	PASSED
7326.000000	29.90	31.26	27.00	2.90	VERTICAL	PASSED
17848.705411	42.50	133.35	21.80	20.70	HORIZONTAL	PASSED

RX mode, channel 11 / 2462 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4924.000000	40.10	101.16	41.20	-1.1	HORIZONTAL	PASSED
7386.000000	42.70	136.46	39.50	3.2	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dB μ V/m]	E [μ V/m]	U _{RX} [dB μ V]	A _{TOT} [dB]	Polarisation	Result
4924.000000	27.00	22.39	28.10	-1.1	HORIZONTAL	PASSED
7386.000000	29.80	30.90	26.60	3.2	HORIZONTAL	PASSED

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	Transmatic	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	Transmatic	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

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