FCC Part 15B Compliance Test Report

Test Report no.:	FCC15B_RM-781_11.docx	**Date of Report:**	22-Sep-2011
Number of pages:	12	**Customer's Contact person:**	Kill-Tollnek Vivian
Testing laboratory:	TCC Nokia Copenhagen Laboratory Frederikskaj 1790 COPENHAGEN V DENMARK Tel. +45 33 292929 Fax. +45 33 292934	**Customer:**	Nokia Corporation Lise Meitner Strasse 10 89081 ULM GERMANY Tel. +49 731 1754 0 Fax. +49 731 1754 6800
FCC listing no.: **IC recognition no.:**	99059 661AL-1		
Tested devices/ accessories:	**Phone RM-781 / Battery BL-4U / AC-Charger AC-8E / Headset HS-125 / Laptop Lenovo T61**		
FCC ID:	PPIRM-781	**IC:**	661U-RM781
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, RSS-132 (Issue 2, September 2005), RSS-133 (Issue 5, February 2009), RSS-210 (Issue 8, December 2010). 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:	R Hansen Digitally signed by Ruben Hansen DN: cn=Ruben Hansen, o=TCC NOKIA, ou=EMC, email=ruben.hansen@nokia.com, c=DK Date: 2011.09.22 13:21:17 +02'00'		

Ruben Hansen, System Manager, EMC

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	8-Sep-2011
Testing completed	22-Sep-2011
The customer's contact person	Kill-Tollnek Vivian
Test Plan referred to	T:\Projects\RM-781\TestPlan\RS_testplan_RM-781.xls
Notes	-
Document name	T:\Projects\RM-781\EMC\FCC15B_RM-781_11.docx

1.1. EUT and Accessory Information

The EUT is a 10-band mobile phone:
GSM850/900/1800/1900/GPRS/EGPRS/Monopole without GND reflector (GSM/WCDMA)
WCDMA I/II(1900)/V(850)/VIII/HSDPA/HSUPA/Monopole without GND reflector (GSM/WCDMA)
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-781	004402135658908	0110	-	6.65	26178
AC-Charger	AC-8E	4090499301040501991;0675387	-	-	-	24248
Headset	HS-125	06943230116R4102426	-	-	-	24297
USB Cable	CA-101	07306347316				26731
Laptop	Lenovo T61	1S7665D71L3W8321	-	-	-	24950
Battery	BL-4U	4181571141000001365;0670560	-	-	-	26172
USB Memory Stick	-	-	-	-	-	23929

1.2. Summary of Test Results

WCDMA 850 (Band V):

Section in CFR 47	Section in ICES-003 (RSS-132)	Name of the test	Result
15.107, a	5.3	AC power line conducted emissions	PASSED
15.109, a	5.5 (4.6)	Radiated emissions	PASSED

WCDMA 1900 (Band II):

Section in CFR 47	Section in ICES-003 (RSS-133)	Name of the test	Result
15.107, a	5.3	AC power line conducted emissions	PASSED
15.109, a	5.5 (6.6)	Radiated emissions	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.

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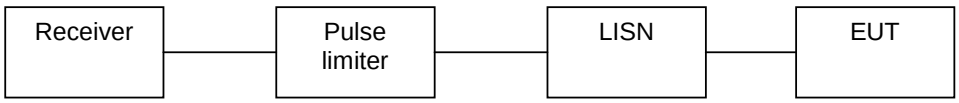
2. AC power line conducted emissions
(FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RM-781, DUT 26178
Accessories with DUT numbers	AC-8E, DUT 24248 ; HS-125, DUT 24297 ; Lenovo T61, DUT 24950 ; BL-4U, DUT 26172 ; USB Memory stick, DUT 23929; CA-101, DUT 26731
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 48 / 102.0
Date of measurements	22-Sep-2011
Measured by	Ruben Hansen

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:

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

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

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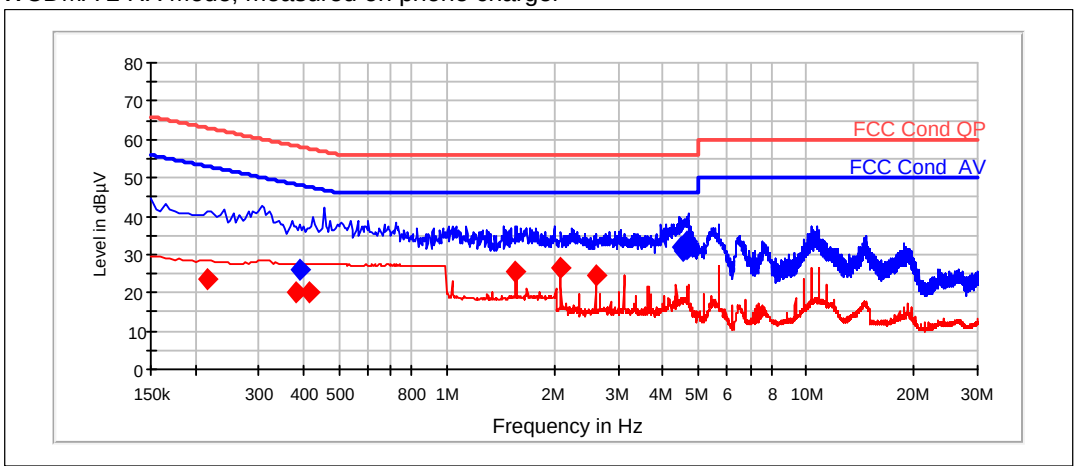
2.3. Test results

2.3.1 WCDMA 2

WCDMA 2 RX Mode, measured on phone charger



QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.39	26.04	N	PASSED
4.5	31.72	N	PASSED
4.52	31.77	N	PASSED
4.54	31.16	N	PASSED
4.665	31.62	N	PASSED
4.67	33.31	N	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.215	23.35	L1	PASSED
0.38	20.07	L1	PASSED
0.415	20.08	N	PASSED
1.555	25.56	N	PASSED
2.075	26.32	N	PASSED
2.595	24.77	N	PASSED

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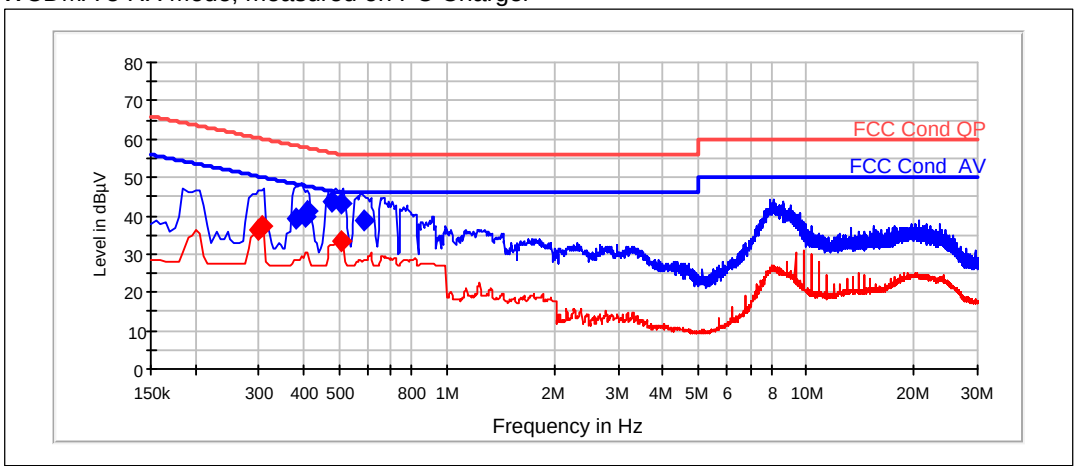
2.3.2 WCDMA 5

WCDMA 5 RX Mode, measured on PC Charger



QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.38	39.26	L1	PASSED
0.405	39.83	L1	PASSED
0.41	41.27	N	PASSED
0.48	43.53	N	PASSED
0.51	43.01	L1	PASSED
0.59	38.59	N	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.3	36.39	N	PASSED
0.305	37.35	N	PASSED
0.51	33.51	L1	PASSED

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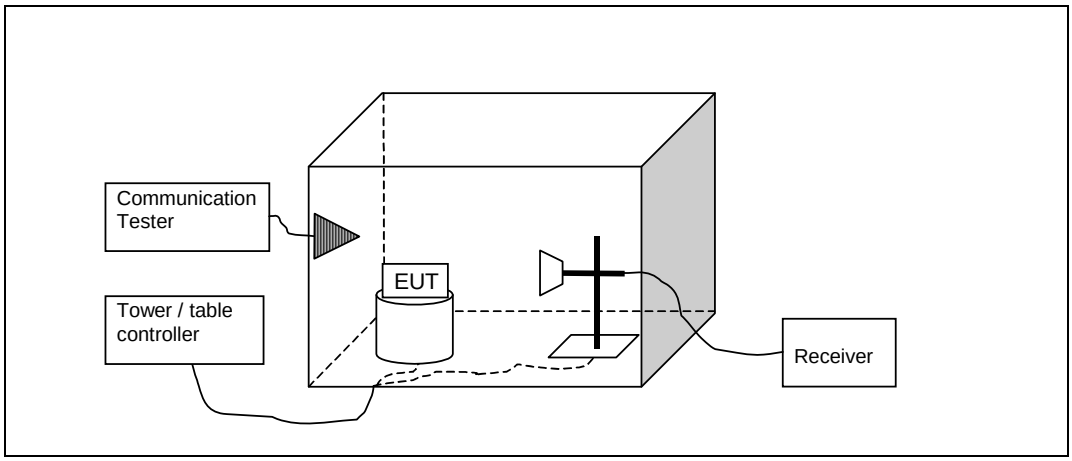
3. Radiated emissions

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

EUT with DUT number	RM-781, DUT 26178
Accessories with DUT numbers	AC-8E, DUT 24248 ; HS-125, DUT 24297 ; Lenovo T61, DUT 24950 ; BL-4U, DUT 26172 ; USB Memory stick, DUT 23929; CA-101, DUT 26731
Operation Voltage [V] / [Hz]	115 / 60
Results	PASSED
Remarks	None
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	24 / 55 / 101.8
Date of measurements	21-Sep-2011
Measured by	Christian Andersen

3.1.1 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.

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

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

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3.3. WCDMA 850 (Band V) Test results

RX mode, channel 4357 / 871.4 MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
1744.7	40.88	110.624	43.74	-2.86	HORIZONTAL	PASSED
2614.3	47.1	226.334	43.87	3.23	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
1744.7	27.56	23.878	30.42	-2.86	HORIZONTAL	PASSED
2614.3	33.51	47.381	30.28	3.23	HORIZONTAL	PASSED

RX mode, channel 4400 / 880.0 MHz

Quasi peak (RBW: 120 kHz, VBW: 300 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
31.23	12.4	4.169	26.37	-13.97	VERTICAL	PASSED
44.303	5.72	1.932	27.54	-21.82	VERTICAL	PASSED
69.843	4.49	1.677	31.48	-26.99	HORIZONTAL	PASSED
73.806	0.86	1.104	27.42	-26.56	HORIZONTAL	PASSED
76.399	1.7	1.217	27.95	-26.25	HORIZONTAL	PASSED
78.236	2.16	1.283	28.18	-26.02	HORIZONTAL	PASSED
107.331	7.8	2.456	30.19	-22.39	VERTICAL	PASSED
114.186	5.29	1.84	27.66	-22.37	VERTICAL	PASSED
118.99	5.94	1.981	28.3	-22.36	VERTICAL	PASSED
119.28	6.63	2.145	28.99	-22.36	VERTICAL	PASSED

RX mode, channel 4400 / 880.0 MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
7821.946	49.99	315.718	37.64	12.35	HORIZONTAL	PASSED
7830.565	50.79	346.218	38.42	12.37	HORIZONTAL	PASSED
7844.086	50.37	330.027	38.16	12.21	HORIZONTAL	PASSED
7848.901	49.39	294.815	37.24	12.15	VERTICAL	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
7821.946	37.15	72.011	24.8	12.35	HORIZONTAL	PASSED
7830.565	37.21	72.519	24.84	12.37	HORIZONTAL	PASSED
7844.086	37.15	72.003	24.94	12.21	HORIZONTAL	PASSED
7848.901	36.94	70.267	24.79	12.15	VERTICAL	

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RX mode, channel 4458 / 891.6 MHz

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
1781.6	40.49	105.779	42.86	-2.37	HORIZONTAL	
2676.7	45.88	196.789	42.98	2.9	HORIZONTAL	

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Polarisation	Result
1781.6	27.79	24.527	30.16	-2.37	HORIZONTAL	
2676.7	33.16	45.504	30.26	2.9	HORIZONTAL	

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4. Test Equipment

4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
13037	Power Supply 0-15V 10A	EA3012	LP Instruments	15C, 15B
13357	Signal Generator	SMP02	Rohde&Schwarz	22/24/27, 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
20682	LISN	ESH3-Z5	Rohde&Schwarz	15C, 15B
16601	Communication Tester	CMU200	Rohde&Schwarz	22/24/27, 15C, 15B
16995	Directional Coupler 20dB 0,5-2,0 GHz SMA Conn.	1538RA-20	Weinschel	15C, 15B
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15C, 15B
18772	Shielded Chamber	RFD-100	ETS-Lindgren	15C, 15B
19116	Power splitter	-	various	22/24/27, 15C, 15B
19171	Communication Tester	CMU200	Rohde&Schwarz	15C, 15B
19625	Climatic Chamber	VT4002EMC	Vötsch	22/24/27, 15C, 15B
19678	Spectrum Analyzer	FSP	Rohde&Schwarz	22/24/27, 15C, 15B
20168	Bluetooth Tester	CBT	Rohde&Schwarz	22/24/27, 15C, 15B
20543	UPS. 700V/A 490W	PW 9120 700i	Powerware	22/24/27, 15C, 15B
20544	Transformer. 230/115V	-	Nokia	22/24/27, 15C, 15B
20739	Communication Tester	CMU200	Rohde&Schwarz	15C, 15B

4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
13077	Power Supply	EA-3016	-	22/24/27, 15C, 15B
13799	Signal Generator	SMP02	Rohde&Schwarz	22/24/27, 15C, 15B
13936	Band reject filter	WRCD1747.5-0.2/40-10SS	Wainwright Instruments	22/24/27, 15C, 15B
13937	Band reject filter	WRCA902.4-0.2/40-6SS	Wainwright Instruments	22/24/27, 15C, 15B
14021	Relay Dual 6 Chnl µWave Mux	10-785-522	-	22/24/27, 15C, 15B
14114	Highpass Filter	WHK1000-12SS	Wainwright Instruments	22/24/27, 15C, 15B
14187	Band reject filter	WRCD1747.5-0.2/40-10SS	Wainwright	22/24/27, 15C, 15B
14188	Band reject filter	WRCA902.4-0.2/40-6SS	Wainwright	22/24/27, 15C, 15B
14900	Antenna Controller	HD100	HD GmbH	22/24/27, 15C, 15B
15191	Turntable Contoller Unit	G-800SDX	YAESU	22/24/27, 15C, 15B
15742	Programmable Relay Switching System	----------	Pickering	22/24/27, 15C, 15B
16633	Band reject filter	WRCD1880.0-0.2/40-10SS	Wainwright	22/24/27, 15C, 15B
16948	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24/27, 15C, 15B
16949	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24/27, 15C, 15B
17644	Dual 6 Channel MUX Microwave Relay SMA 50 Ohm	10-785-522	Pickering	22/24/27, 15C, 15B
18416	Communication Tester	CMU200	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
18792	Mast/turntable controller	2090	ETS-EMCO	22/24/27, 15C, 15B

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Eq. No	Equipment	Type	Manufacturer	Used in
18860	Antenna	HL562	Rohde&Schwarz	22/24/27, 15C, 15B
19151	High Pass Filter	WHJS3000-10SS	Wainwright	22/24/27, 15C, 15B
19587	Band reject filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	22/24/27, 15C, 15B
19966	Antenna	HFH2-Z2	Rohde&Schwarz	15C, 15B
20078	Relay 2x6 Chnl µWave Mux	10-785B-522	Pickering	22/24/27, 15C, 15B
20114	Band reject filter	WRCG1737/1743-1733/1747-40/6SS	Wainwright	22/24/27, 15C, 15B
20115	Band reject filter	-	Wainwright	22/24/27, 15C, 15B
20116	Band reject filter	WRCG832/83/-825/845-40/5SS	Wainwright	22/24/27, 15C, 15B
20168	Bluetooth Tester	CBT	Rohde&Schwarz	22/24/27, 15C, 15B
20543	UPS. 700V/A 490W	PW 9120 700i	Powerware	22/24/27, 15C, 15B
20544	Transformer. 230/115V	-	Nokia	22/24/27, 15C, 15B
20698	Antenna	BBHA 9120 D	SCHWARZBECK	22/24/27, 15C, 15B
-	Relay Dual 6 Chnl µWave Mux	10-785-522	-	22/24/27, 15C, 15B

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