FCC Part 15B Compliance Test Report

Test Report no.:	FCC15B_RM-878_04.docx	**Date of Report:**	20-Sep-2012
Number of pages:	10	**Customer's Contact person:**	Jerry Williams
Testing laboratory:	TCC Nokia San Diego Laboratory 16620 West Bernardo Drive San Diego, CA 92127 USA Tel. +1 858 831 5000 Fax. +1 858 831 6500	**Customer:**	Nokia, Inc. 16620 West Bernardo Drive San Diego, CA 92127 USA Tel. +1 858 831 5000 Fax. +1 858 385 1598
FCC listing no.: **IC recognition no.:**	586140 10162A-1		
Tested devices/ accessories:	**Phone RM-878 / Battery BP-4W / Charger AC-50U / Micro USB cable CA-190CD / Headset WH-208**		
FCC ID:	QMNRM-878	**IC:**	661X-RM878
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-139 (Issue 2, 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:	Digitally signed by You Feng DN: o=Nokia, ou=People, 0.9.2342.19200300.100.1.1=1016 1213, cn=You Feng Date: 2012.09.20 13:28:20 -07'00'		

Feng You, Senior Specialist

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1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	23-Aug-2012
Testing completed	07-Sep-2012
The customer's contact person	Jerry Williams
Test Plan referred to	T:\Projects\RM-878\TestPlan\RS_testplan_RM-878_EMC_FCC_SAR.xlsm
Notes	-
Document name	T:\Projects\RM-878\EMC\FCC15B_RM-878_04.docx

1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:
GSM/WCDMA/WLAN/Bluetooth
The EUT is tested with maximum rated TX power.

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-878	004402471091631	0205	060	1530.0035.8516.9754.12312	30627
Battery	BP-4W	3932132274140101601;0670672	-	-	-	30588
Charger	AC-50U	4090492185270514505;0675620	NA	NA	NA	30619
Micro USB cable	CA-190CD	NA	NA	NA	NA	30620
Headset	WH-208	NA	NA	NA	NA	30621

1.2. Summary of Test Results

GSM850:

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

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 powerline conducted emissions	NP
15.109, a	5.5 (4.6)	Radiated emissions	NP

GSM1900:

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

WCDMA 1700 (Band IV):

Section in CFR 47	Section in ICES-003 (RSS-139)	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	NP

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15.109, a	5.5 (6.6)	Radiated emissions	PASSED

WLAN:

Section in CFR 47	Section in ICES-003 (RSS-139)	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	NP
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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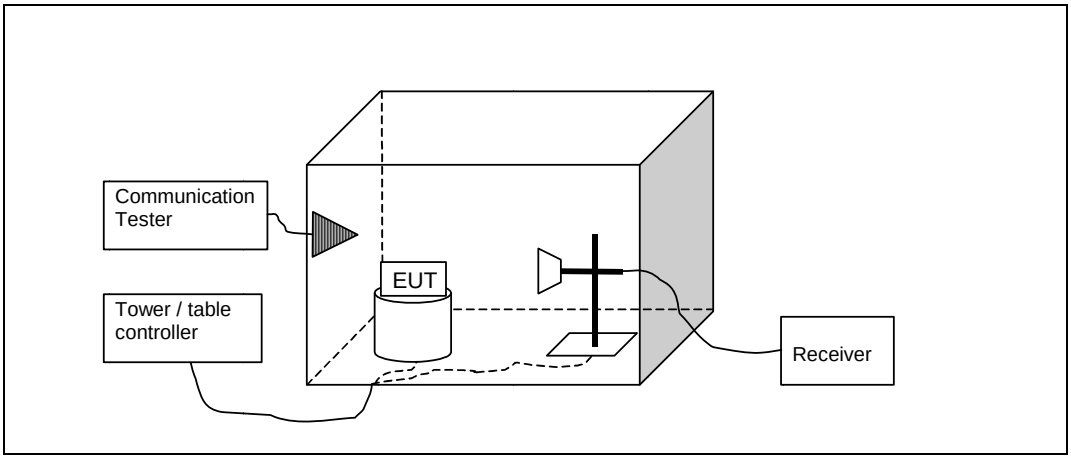
2. Radiated emissions

(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-878, DUT 30627
Accessories with DUT numbers	BP-4W, DUT 30588 ; AC-50U, DUT 30619 ; CA-190CD, DUT 30620 ; WH-208, DUT 30621
Operation Voltage [V] / [Hz]	115V / 60Hz
Results	PASSED
Remarks	GPS was active during the test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	17.9 / 43.9%
Date of measurements	06-Sep-2012
Measured by	Feng You/Ty Hawes/Paul Grossburg

2.1.1 Test setup



2.2. 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:

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

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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2.3. GSM850 test results, GPS active

CH 128 / 824.2 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3475.7	46.4	208.93	38.34	8.06	27.6	74	PASSED
6953.2	53.13	453.211	39.87	13.26	20.9	74	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3475.7	33.45	47.027	25.39	8.06	20.6	54	PASSED
6953.2	40.51	106.096	27.25	13.26	13.5	54	PASSED

CH 190 / 836.6 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3001.8	47.54	238.122	37.84	9.7	26.5	74	PASSED
3524.9	47.05	225.035	38.64	8.41	27	74	PASSED
7054.3	53.5	473.315	40.44	13.06	20.5	74	PASSED

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
30.03	20.38	10.452	24.57	-4.19	19.6	40	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3001.8	34.43	52.662	24.73	9.7	19.6	54	PASSED
3524.9	33.5	47.299	25.09	8.41	20.5	54	PASSED
7054.3	40.5	105.864	27.44	13.06	13.5	54	PASSED

CH 251 / 848.8 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3575.1	46.03	200.309	37.37	8.66	28	74	PASSED
7148.7	53.67	482.225	40.32	13.35	20.3	74	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3575.1	33.56	47.632	24.9	8.66	20.4	54	PASSED
7148.7	40.89	110.739	27.54	13.35	13.1	54	PASSED

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2.4. GSM1900 test results, GPS Active

CH 512 / 1850.2 MHz
Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3859.5	49.8	309.03	40.78	9.02	24.2	74	PASSED
7720.6	54.6	536.785	40.18	14.42	19.4	74	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3859.5	36.54	67.158	27.52	9.02	17.5	54	PASSED
7720.6	41.77	122.56	27.35	14.42	12.2	54	PASSED

CH 661 / 1880 MHz
Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3000	48.99	281.514	37.36	11.63	25	74	PASSED
3919.1	50.19	323.184	41.23	8.96	23.8	74	PASSED
7839.5	54.61	537.774	40.25	14.36	19.4	74	PASSED

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
30.78	19.9	9.89	24.54	-4.64	20.1	40	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3000	36.65	67.983	25.02	11.63	17.4	54	PASSED
3919.1	36.64	67.913	27.68	8.96	17.4	54	PASSED
7839.5	41.71	121.759	27.35	14.36	12.3	54	PASSED

CH 810 / 1909.8 MHz
Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3979.2	49.64	303.284	40.61	9.03	24.4	74	PASSED
7960.2	54.33	520.535	40.05	14.28	19.7	74	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
3979.2	36.63	67.866	27.6	9.03	17.4	54	PASSED
7960.2	41.69	121.451	27.41	14.28	12.3	54	PASSED

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2.5. WCDMA 1700 (Band IV) test results, GPS Active

Channel 1312 / 1712.4 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
4226.6	49.17	287.243	40.04	9.13	24.8	74	PASSED
6337.1	51.96	396.278	40.02	11.94	22	74	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
4226.6	36.43	66.267	27.3	9.13	17.6	54	PASSED
6337.1	39.25	91.706	27.31	11.94	14.8	54	PASSED

Channel 1450 / 1740.0 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
2140.1	44.66	170.962	37.58	7.08	29.3	74	PASSED
3001.2	47.26	230.569	37.56	9.7	26.7	74	PASSED
4278.1	49.96	314.702	40.39	9.57	24	74	PASSED
6418.7	52.18	406.35	40.13	12.05	21.8	74	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
2140.1	31.02	35.571	23.94	7.08	23	54	PASSED
3001.2	34.44	52.705	24.74	9.7	19.6	54	PASSED
4278.1	36.86	69.695	27.29	9.57	17.1	54	PASSED
6418.7	39.46	93.94	27.41	12.05	14.5	54	PASSED

Channel 1513 / 1752.6 MHz

Peak (RBW: 1 MHz, VBW: 3 MHz)

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
4304.9	49.88	311.925	40.38	9.5	24.1	74	PASSED
6455.8	52.62	427.76	40.35	12.27	21.4	74	PASSED

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

Frequency [MHz]	E [dBµV/m]	E [µV/m]	U_{RX} [dBµV]	A_{TOT} [dB]	Margin	Limit [dBµV/m]	Results
4304.9	36.84	69.478	27.34	9.5	17.2	54	PASSED
6455.8	39.71	96.761	27.44	12.27	14.3	54	PASSED

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3. Test Equipment

3.1. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
N/A	Band Reject Filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
7984	Data Logger	Testo175H1	Testo	-
3397	Signal Generator	83630B	Agilent	-
7591	Antenna	HL562	R&S	-
N/A	RF immunity / Emission Software	EMC32	R&S	-
7459	Open switch and control unit	TS-RSP	R&S	-
5729	Open switch and control unit	TS-RSP	R&S	-
N/A	Notch Filter	GSM1900	TTE	24
N/A	Notch Filter	GSM850	Trilithic	22
7572	Antenna	3117	EMCO	-
5730	Preamp/Switch Box	TS-ANA	R&S	
N/A	Band Reject Filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	-
N/A	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	24
N/A	Band Reject Filter	WRCA824/849-0,2-6SS	Wainwright	22
4406	Communication Tester	CMU200	R&S	-
7646	Anechoic Chamber	3 m Semi / Full Anechoic Chamber	ETS-Lindgren	-
7451	EMI Receiver	ESU-26	R&S	-
3406	Mast/Turntable Controller	SC99V	Sunol	-

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