

FCC Part 15C Compliance Test Report

Test Report no.:	FCC15CNFC_RM-927_21.docx	Date of Report:	29-Aug-2013
Number of pages:	10	Customer's Contact person:	Victoria Abadilla
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.:	586140		
IC recognition no.:	10162A-1		
Tested devices/ accessories:	Phone RM-927 / Dummy Battery SD-217R / AC Charger AC-60 / Data Cable CA-190 / Headset WH-902		
FCC ID:	QMND	IC:	661X-D
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart C, ANSI C63.4 (2009), IC standards. 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:			

Tyrone Hawes, Specialist

1. Summary for FCC Part 15C Compliance Test Report

Date of receipt	20-Jul-2013
Testing completed	29-Aug-2013
The customer's contact person	Victoria Abadilla
Test Plan referred to	T:\Projects\RM-927\TestPlan\RS_testplan_RM-927.xlsm
Notes	-
Document name	T:\Projects\RM-927\EMC\FCC15CNFC_RM-927_21.docx

1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:

GSM/CDMA/WCDMA/LTE/WLAN/Bluetooth

The EUT is tested with maximum rated TX power.

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-927	004402472477441	0200	-	1028.2900.1331.2000	30754
Dummy Battery	SD-217R	50409	0.2	-	-	30755
Phone	RM-927	355906050012326	0160	-	1028.0305.1329.2000	30747
AC Charger	AC-60	4090493175610303747	-	-	-	30748
Data Cable	CA-190	-	-	-	-	30749
Headset	WH-902	-	-	-	-	30750

1.2. Summary of Test Results

NFC:

Section in CFR 47	Section in RSS-210	Name of the test	Result
15.209	2.6	Radiated emission below 30 MHz	NP
15.209	A2.6	Radiated emission above 30 MHz	NP
15.225(a-d)	A2.6	Field strength in the 13.56 MHz band	NP
	4.6.1	Occupied Bandwidth	PASSED
15.225(e)	A2.6	Frequency stability, temperature variation	PASSED
15.225(e)	A2.6	Frequency stability, voltage variation	PASSED
15.207	7.2.2	AC power line conducted emission	PASSED

PASSED

FAILED

NP

The EUT complies with the essential requirements in the standard.

The EUT does not comply with the essential requirements in the standard.

The test was not performed by the TCC Nokia Laboratory.

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2. Occupied bandwidth

EUT with DUT number	NHL-99, DUT 30754
Accessories with DUT numbers	SD-217R, DUT 30755
Operation Voltage [V] / [Hz]	3.8V DC
Results	PASSED
Remarks	
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20.5 / 49.0 / 1050
Date of measurements	28-Aug-2013
Measured by	Tyrone Hawes

2.1. Test Setup

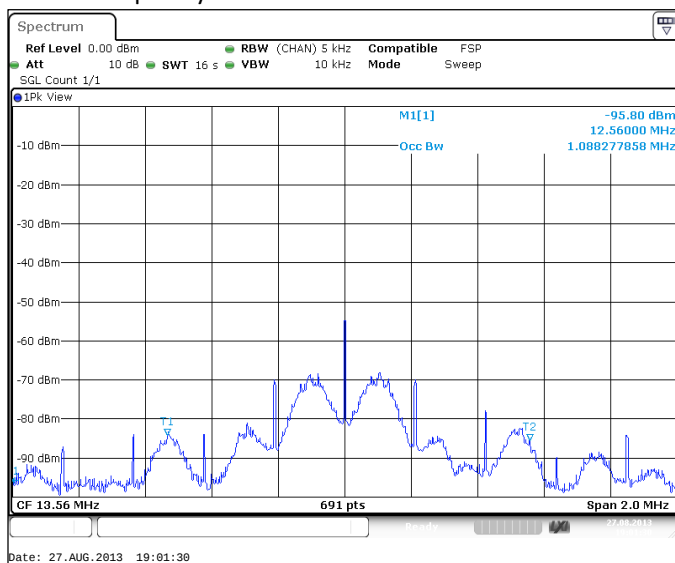
A small whip antenna was placed close to the EUT, and connected to the measuring Spectrum Analyzer.

2.2. Test method and limit

The Test was carried out with the EUT in Test mode with modulation on.

2.3. NFC Test results

NFC TX Frequency = 13.56 MHz



Operation mode (TX on)	Occupied bandwidth [kHz]
NFC, modulated	1088.3

3. Frequency stability, temperature variation (FCC §15.225 (e) [2], RSS-210 A2.6)

EUT with DUT number	RM-927, DUT 30754
Accessories with DUT numbers	SD-217R, DUT 30755
Operation Voltage [V] / [Hz]	3.8V DC
Results	PASSED
Remarks	
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21.0 / 49.2 / 1050
Date of measurements	15-Aug-2013
Measured by	Feng You

3.1. Test Setup

The EUT was placed in a Climatic Chamber. A small whip antenna was placed close to the EUT, and connected to the measuring Spectrum Analyzer. Measurement performed without modulation on TX.

3.2. Test method and limit

The measurement is made according to FCC rules FCC 47 CFR Part 15 section 15.225 (e) [2] and RSS-210 A2.6

- The EUT is placed in the chamber in transmit mode.
- The climate chamber temperature is set to the maximum value and allowed to stabilize.
- The transmit frequency is measured.
- Temperature is lowered to the next temperature value and allowed to stabilize.
- The steps c - d is repeated for each temperature.

Limits for frequency stability, temperature variation measurements

Frequency deviation [%]
+/- 0.01

3.3. NFC Test results

NFC TX Frequency = 13.56 MHz

Temperature [°C]	Frequency [MHz]	Deviation [kHz]	Deviation [%]	Result
50	13.559958	-0.042	-0.000310	PASSED
40	13.560004	0.004	0.000029	PASSED
30	13.560047	0.047	0.000347	PASSED
20	13.560053	0.053	0.000391	PASSED
10	13.560125	0.125	0.000922	PASSED
0	13.560122	0.122	0.000900	PASSED
-10	13.560154	0.154	0.001136	PASSED
-20	13.560139	0.139	0.001025	PASSED
-30	13.560078	0.078	0.000575	PASSED

4. Frequency stability, voltage variation (FCC §15.225 (e) [2], RSS-210 A2.6)

EUT with DUT number	RM-927, DUT 30754
Accessories with DUT numbers	SD-217R, DUT 30755
Operation Voltage [V] / [Hz]	3.6V-4.2V DC
Results	
Remarks	
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21.0 / 49.2 / 1050
Date of measurements	15-Aug-2013
Measured by	Feng You

4.1. Test Setup

A small whip antenna was placed close to the EUT, and connected to the measuring Spectrum Analyzer.

4.2. Test method and limit

The EUT battery was replaced with an adjustable power supply. The frequency stability was measured at nominal voltage and at +5% and -15%. Measurement performed without modulation on TX.

Limits for frequency stability, voltage variation measurements

Frequency deviation [%]
+/- 0.01

4.3. NFC Test results

NFC TX Frequency = 13.56 MHz

Voltage [V]	Frequency [MHz]	Deviation [kHz]	Deviation [%]	Result
4.2	13.560096	0.096	0.000708	PASSED
3.6	13.560088	0.088	0.000649	PASSED
3.8	13.560086	0.086	0.000634	PASSED

5. AC powerline conducted emissions (FCC §15.207, RSS-GEN 7.2.2)

EUT with DUT number	RM-927, DUT 30747
Accessories with DUT numbers	AC-60, DUT 30748 ; CA-190, DUT 30749 ; WH-902, DUT 30750
Operation Voltage [V] / [Hz]	120Vac/60Hz
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH]	23.5/31.1
Date of measurements	29-Jul-2013
Measured by	Paul Grossberg

5.1. Test Setup



5.2. Test method and limit

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:

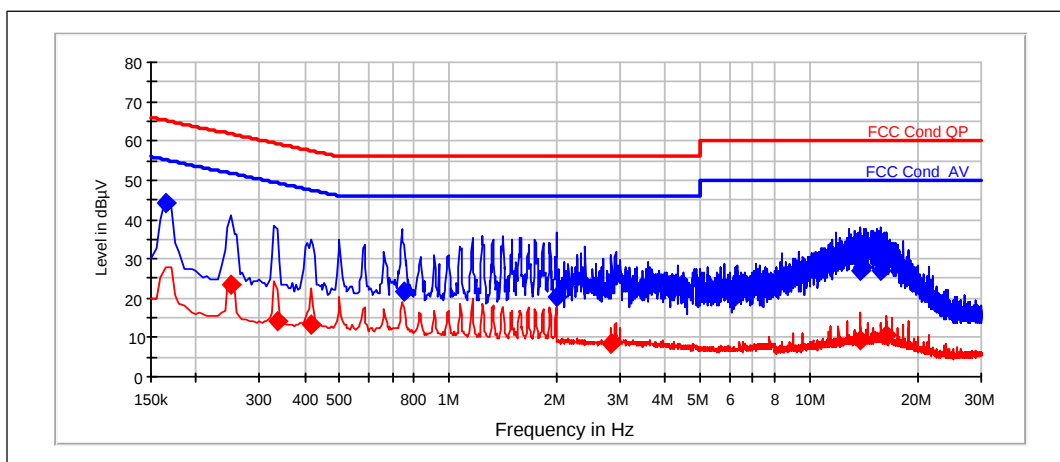
$$U [dB\mu V] = U_{RX} + A_{TOT}$$

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

5.3. NFC Test results



QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.165	44.39	L1	PASSED
0.755	21.64	N	PASSED
1.995	20.49	L1	PASSED
13.91	26.96	L1	PASSED
14.09	27.93	L1	PASSED
15.835	27.01	L1	PASSED

Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.25	23.59	L1	PASSED
0.335	13.93	N	PASSED
0.415	13.34	N	PASSED
2.825	8.6	N	PASSED
13.87	9.24	L1	PASSED
16.34	10.44	L1	PASSED

6. Test Equipment

6.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
4406	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
7602	Communication Tester	CMW500	R&S	22/24/27, 15C, 15B
7151	Bluetooth Tester	CBT	R&S	15B
-	GPS RX Antenna w/AMP	L1A-PM-NF	GPS Source	15C
-	GPS Inline amplifier	A11M-V-NF-NM	GPS Source	15C
-	GPS signal Splitter	S12-P110/5-NF	GPS Source	15C
-	GPS TX Antenna	L1P-PV-NF	GPS Source	15C
7912	Spectrum Analyzer	FSV-30	R&S	22/24/27, 15C
-	Thermal Chamber	VT-4002	Vötsch	22/24/27, 15C
-	Power splitter	11667B	Agilent	22/24/27, 15C
3396	EMC Analyzer	E7405A	HP	-
7451	EMI Receiver	ESU-26	R&S	22/24/27, 15C, 15B
4188	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
6981	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
-	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
7582	Signal Generator	SMB100A	R&S	15C, 15B

6.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
7591	Antenna	HL562	R&S	22/24/27, 15C, 15B
7572	Double Ridge Horn Antenna	3117	ETS-Lindgren	22/24/27, 15C
7607	Standard Gain HornAntenna	SAS 586	A.H. System	22/24/27, 15C
7624	Standard Gain HornAntenna	SAS 587	A.H. System	22/24/27, 15C
7561	Antenna	HFH2-Z2	R&S	15C, 15B
5715	Antenna	MBA-3030	EMC Automation	22/24/27, 15C
5712	Antenna	PLP3003	EMC Automation	22/24/27, 15C
7457	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
7459	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
5729	Relay Switch Unit	TS-RSP	R&S	22/24/27, 15C, 15B
5728	EMI Receiver	ESIB26	R&S	22/24/27, 15C, 15B
4406	Communication Tester	CMU200	R&S	22/24/27, 15C, 15B
7602	Communication Tester	CMW500	R&S	22/24/27, 15C, 15B
7151	Bluetooth Tester	CBT	R&S	15B
3406	Controller	Sc99V	Sunol	22/24/27, 15C, 15B
-	Controller	G-1000DXC	Yaesu	22/24/27, 15C, 15B
-	Computer Controller	GS-232B	Yaesu	22/24/27, 15C, 15B
7040	Preamplifier	TS-PR3	R&S	22/24/27, 15C, 15B
-	Preamplifier	AMF-6D-020180-29-20P	Miteq	22/24/27, 15C, 15B
-	Preamplifier	AMF-4D-01000800-30-29P	Miteq	22/24/27, 15C, 15B
-	Preamplifier	AMF-5F-18002650-25-10P	Miteq	22/24/27, 15C, 15B
-	High Pass Filter	4HC1700-1-KK	R&S	22
-	High Pass Filter	F-15041	RLC	22/24/27, 15C
-	Band Reject Filter	WRCA824/849-0,2-6SS	Wainwright	22
-	Band Reject Filter	WRCC1800/2000-0.2-10SS	Wainwright	24
-	Band Reject Filter	WRCG2400/2483-2390/2493-35/10SS	Wainwright	15C
-	Band Reject Filter	WRCG832/838-825/845-40/5SS	Wainwright	22
-	Band Reject Filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27

Eq. No	Equipment	Type	Manufacturer	Used in
-	Band Reject Filter	WRCG1877/1883 - 1870/1890-40/6SS	Wainwright	24
-	Notch Filter	WRCD1880-1.1.25/50-10SS	Wainwright	22/24/27
-	Notch Filter	WRCT902.4-0.4/40-8SS	Wainwright	-
Planned	Notch Filter	WRCJV2531/2539-2523/2547-60/12SS	Wainwright	22/24/27
-	GPS RX Antenna w/AMP	L1A-PM-NF	GPS Source	15C
-	GPS Inline amplifier	A11M-V-NF-NM	GPS Source	15C
-	GPS signal Splitter	S12-P110/5-NF	GPS Source	15C
-	GPS TX Antenna	L1P-PV-NF	GPS Source	15C