

## FCC Part 15C Compliance Test Report

<b>Test Report no.:</b>	FCC15CNFC_RM-927_26.docx	<b>Date of Report:</b>	26-Aug-2013
<b>Number of pages:</b>	11	<b>Customer's Contact person:</b>	Victoria Abadilla
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<b>FCC listing no.:</b>	586140		
<b>IC recognition no.:</b>	10162A-1		
<b>Tested devices/ accessories:</b>	<b>Phone RM-927 / Cable CA-190 / Salcomp AC Charger AC-60 / Headset WH-902</b>		
<b>FCC ID:</b>	QMND	<b>IC:</b>	661X-D
<b>Supplement reports:</b>	-		
<b>Testing has been carried out in accordance with:</b>	<b>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".</b>		
<b>Documentation:</b>	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.		
<b>Test Results:</b>	<b>The EUT complies with the requirements in respect of all parameters subject to the test.</b> The test results relate only to devices specified in this document		
<b>Date and signature for the contents:</b>			

**Tyrone Hawes, Specialist**

## 1. Summary for FCC Part 15C Compliance Test Report

<b>Date of receipt</b>	Check Date
<b>Testing completed</b>	23-Aug-2013
<b>The customer's contact person</b>	Victoria Abadilla
<b>Test Plan referred to</b>	T:\Projects\RM-927\TestPlan\RS_testplan_RM-927.xlsm
<b>Notes</b>	-
<b>Document name</b>	T:\Projects\RM-927\EMC\FCC15CNFC_RM-927_26.docx

### 1.1. EUT and Accessory Information

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

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-927	35590605001377	0160	-	1028.0305.1329.2000	30759
Cable	CA-190	-	-	-	-	30745
Salcomp AC Charger	AC-60	4090493152610300459	-	-	-	30744
Headset	WH-902	-	-	-	-	30746
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

### 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	PASSED
15.209	A2.6	Radiated emission above 30 MHz	PASSED
15.225(a-d)	A2.6	Field strength in the 13.56 MHz band	PASSED
15.207	7.2.2	AC power line conducted emission	NP

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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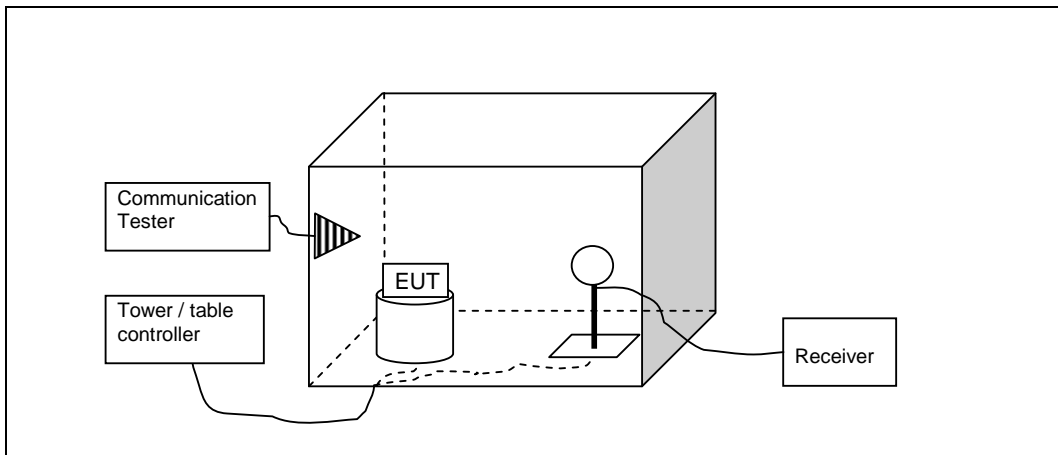
## CONTENTS

<b>1. Summary for FCC Part 15C Compliance Test Report.....</b>	<b>2</b>
1.1. EUT and Accessory Information.....	2
1.2. Summary of Test Results.....	2
<b>2. Radiated Emissions below 30 MHz (FCC §15.209, RSS-GEN 7.2.5) .....</b>	<b>4</b>
2.2. Test method and limit.....	4
2.3. NFC test results .....	5
<b>3. Radiated emissions above 30 MHz (FCC §15.209, RSS-GEN 7.2.5) .....</b>	<b>6</b>
3.2. Test method and limit.....	6
3.3. NFC test results .....	7
<b>4. Field strength in the 13.56 MHz band .....</b>	<b>8</b>
4.2. Test method and limit.....	8
4.3. NFC test results .....	9
<b>5. Test Equipment.....</b>	<b>10</b>
5.1. Conducted measurements .....	10
5.2. Radiated measurements.....	10

## 2. Radiated Emissions below 30 MHz (FCC §15.209, RSS-GEN 7.2.5)

<b>EUT with DUT number</b>	RM-927, DUT 30759
<b>Accessories with DUT numbers</b>	CA-190, DUT 30745 ; AC-60, DUT 30744 ; WH-902, DUT 30746
<b>Operation Voltage [V] / [Hz]</b>	115V/60Hz
<b>Results</b>	PASSED
<b>Remarks</b>	-
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	17.9 /45.0/ 1050
<b>Date of measurements</b>	23-Aug-2013
<b>Measured by</b>	Tyrone Hawes

### 2.1.1 Test setup



### 2.2. Test method and limit

The measurement is made according to ANSI C63.4-2009 and RSS-GEN as follows:

The measurement distance is 3 m.

The limit line has been adjusted with the distance correction factor (+40 dB for 30 m distance, +80 dB for 300 m distance).

The measurement is divided into the Preliminary Measurement and the Final Measurement. The suspected frequencies are searched for in Preliminary Measurement with measuring antenna at fixed height using 2-axis EUT position system, set on the turntable, which is rotated 360 degrees. For all identified emissions, the antenna is adjusted for maximum reading.

The measurement results are obtained as described below:

$$E [dB\mu V/m] = U_{RX} + 20 dB [1/m] + L_{CABLES}$$

Where  $U_{RX}$  is receiver reading, 20 dB the antenna factor of the loop antenna and L the cable attenuation.

Limits for radiated emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit [ $\mu V/m$ ]	Distance [m]	Detector	RBW [kHz]
0.009 - 0.09	2400 / f[kHz]	300	Pk & Avg*	0.2
0.09 - 0.11	2400 / f[kHz]	300	QP	0.2

0.11 - 0.15	2400 / f[kHz]	300	Pk & Avg	0.2
0.15 - 0.49	2400 / f[kHz]	300	Pk & Avg*	9
0.49 - 1.705	24000 / f[kHz]	30	QP	9
1.705 - 30	30	30	QP	9

\* These are average limits. The peak limit is 20 dB above the average limit.

### 2.3. NFC test results

Transmit

MaxPeak

Frequency [MHz]	Reading [dB $\mu$ V/m]	Limit [ $\mu$ V/m]	Distance CF [dB]	Limit @ 3m [dB $\mu$ V/m]	Margin [dB]	Limit [dB $\mu$ V/m]	Results
0.0309	65.666	77.67	80	137.84	72.2	37.81	PASSED
0.0309	65.436	77.67	80	137.84	72.4	37.81	PASSED
0.032	65.219	75.00	80	137.56	72.3	37.50	PASSED
0.0321	65.229	74.77	80	137.54	72.3	37.47	PASSED

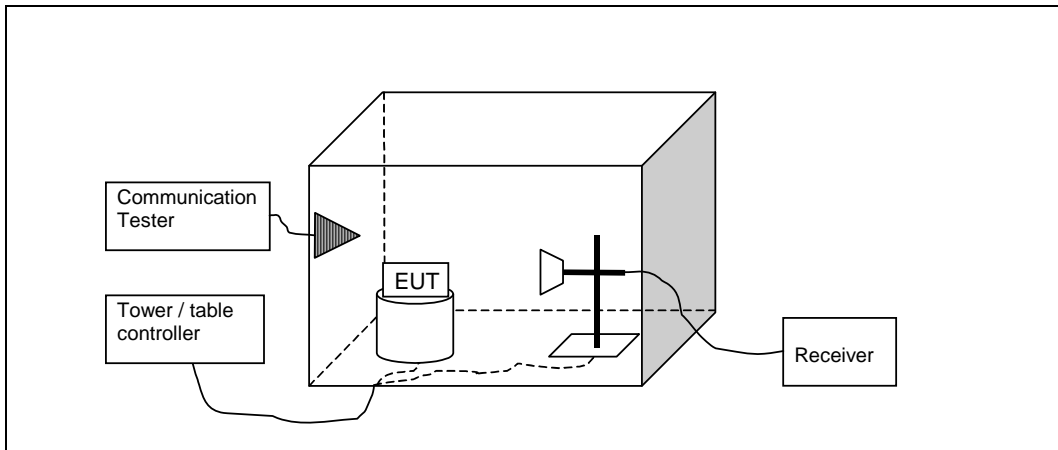
Average

Frequency [MHz]	Reading [dB $\mu$ V/m]	Limit [ $\mu$ V/m]	Distance CF [dB]	Limit @ 3m [dB $\mu$ V/m]	Margin [dB]	Limit [dB $\mu$ V/m]	Results
0.0309	61.389	77.67	80	117.84	56.4	37.81	PASSED
0.0309	60.41	77.67	80	117.84	57.4	37.81	PASSED
0.032	63.43	75.00	80	117.56	54.1	37.50	PASSED
0.0321	62.648	74.77	80	117.54	54.9	37.47	PASSED

### 3. Radiated emissions above 30 MHz (FCC §15.209, RSS-GEN 7.2.5)

<b>EUT with DUT number</b>	RM-927, DUT 30759
<b>Accessories with DUT numbers</b>	CA-190, DUT 30745 ; AC-60, DUT 30744 ; WH-902, DUT 30746
<b>Operation Voltage [V] / [Hz]</b>	115V/60Hz
<b>Results</b>	PASSED
<b>Remarks</b>	-
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	17.9 /45.0/ 1050
<b>Date of measurements</b>	23-Aug-2013
<b>Measured by</b>	Tyrone Hawes

#### 3.1.1 Test setup



#### 3.2. Test method and limit

The measurement is made according to the ANSI C63.4-2009 and RSS-Gen as follows:  
The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with absorbers on the floor and measuring antenna at fixed height using 2-axis EUT position system.

The Final Measurement is performed in the Semi-Anechoic Chamber with conducting metal floor, if the Preliminary Measurement results are closer than 20 dB to the permissible value.

The EUT is placed at nonconductive plate at the turntable center.

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:

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

Where  $U_{RX}$  is receiver reading and  $A_{TOT}$  is total correction factor including cable loss, antenna factor and preamplifier gain ( $A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$ ).

Limits for spurious radiated emissions measurements (3 m measurement distance)

Frequency range [MHz]	Limit [ $\mu V/m$ ]	Limit [dB $\mu V/m$ ]	Detector
30 - 88	100	40	Quasi peak
88 – 216	150	43.5	Quasi peak
216 – 960	200	46	Quasi peak
960 – 1000	500	54	Quasi peak
Above 1000	500	54	Average
Above 1000	5000	74	Peak

### 3.3. NFC test results

Transmit

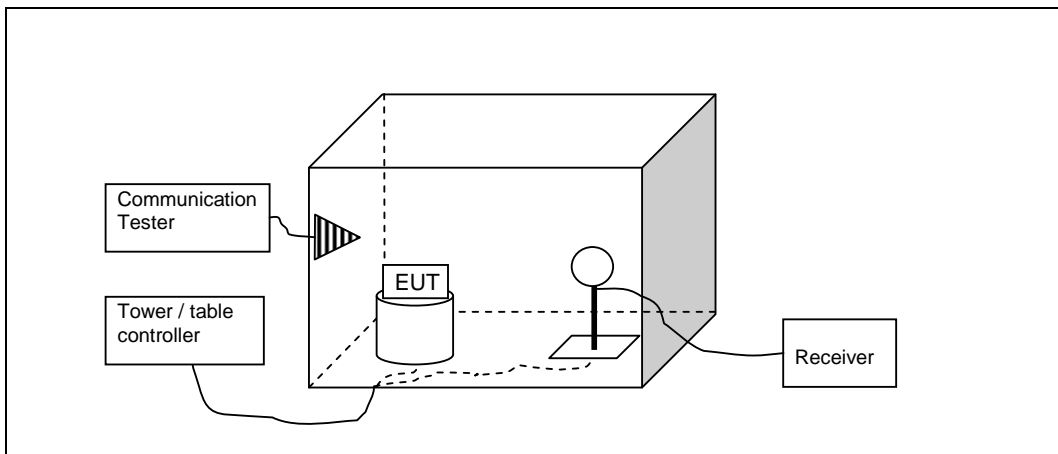
Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dB $\mu V/m$ ]	E [ $\mu V/m$ ]	$U_{RX}$ [dB $\mu V$ ]	$A_{TOT}$ [dB]	Margin	Limit [dB $\mu V/m$ ]	Results
30.45	24.87	17.523	29.14	-4.27	15.1	40	PASSED
31.44	24.78	17.334	29.69	-4.91	15.2	40	PASSED
31.697	23.06	14.22	28.13	-5.07	16.9	40	PASSED

## 4. Field strength in the 13.56 MHz band

<b>EUT with DUT number</b>	RM-927, DUT 30759
<b>Accessories with DUT numbers</b>	CA-190, DUT 30745 ; AC-60, DUT 30744 ; WH-902, DUT 30746
<b>Operation Voltage [V] / [Hz]</b>	115V/60Hz
<b>Results</b>	PASSED
<b>Remarks</b>	-
<b>Temp [°C] / Humidity [%RH] / Air Pressure [kPa]</b>	17.9 /45.0/ 1050
<b>Date of measurements</b>	23-Aug-2013
<b>Measured by</b>	Tyrone Hawes

### 4.1.1 Test setup



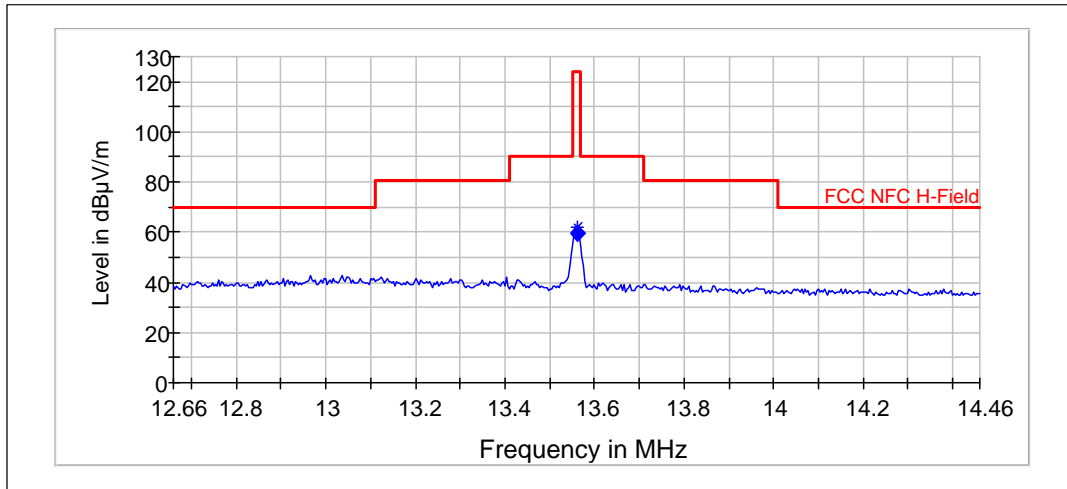
### 4.2. Test method and limit

The measurement is made according to EN 302 291-01, Section 7.1.1  
The measuring distance was 3 meter in RF anechoic chamber.



### 4.3. NFC test results

Radiated H-Field, 3 meter distance



QuasiPeak

Frequency [MHz]	Reading [dBµV]	Result [dBµA/m]	Correction [dB]	Margin [dB]	Limit [dBµV/m]	Results
13.562	59.862	39.86	20	64.1	124	PASSED

## 5. Test Equipment

### 5.1. 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

### 5.2. 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