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EMI CERTIFICATION REPORT

Nokia, Inc.

**12278 Scripps Summit Drive, San Diego,
CA 92131**

Date of Issue: April 30, 2009
Test Report No.: HCT-EF09-0318-5
Test Site: HCT CO., LTD.
HCT FRN: 0005-8664-21

**FCC ID:
IC:**

**QMNRN-464
661X-RM464**

Classification / Standard(s) : FCC PART 15 Subpart B / CISPR 22 Class B
: ICES-003 Issue 4_February 2004, RSS-Gen Issue 2_June 2007,
RSS-129 Issue 2_September 25. 1999, RSS-133 Issue 5_February 2009
Equipment type : Dual-band CDMA phone with BT2.1+EDR
Trade name / Model(s) : Nokia, Inc. / RM-464
Port / Connector(s) : USB data port
FCC listing No : 90661
IC recognition No : IC 5944A-1

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003. (See test report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HCT certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862.

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Test Report Revision History

Test report NO.	Date	Description
HCT-EF09-0318	March 30, 2009	Change the EUT Type Change the MEID Number Page numbering update
HCT-EF09-0318	April 3, 2009	Change the EUT Type Change the MEID Number Change the model name
HCT-EF09-0318-1	April 10, 2009	Separated the certification report and verification report
HCT-EF09-0318-1	April 20, 2009	Add the headset information Add the HW/SW versions, measurement uncertainty, IC ID
HCT-EF09-0318-2	April 24, 2009	Version control update Change the operating mode
HCT-EF09-0318-3	April 27, 2009	Change the Conducted test Configuration Section 2 Change the test equipment list Section 7
HCT-EF09-0318-4	April 29, 2009	Version control update Change from "IC ID" to "IC" Change the operating mode
HCT-EF09-0318-5	April 30, 2009	Version control update Add the version for IC rule.

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ATTACHMENT: TEST SETUP PHOTOGRAPHS

1. GENERAL INFORMATION

1.1 Product description

The Nokia, Inc. RM-464, Dual-band CDMA phone with BT2.1+EDR.

Its basic purpose is used for communications. It transmits from CDMA 850 (824.70 MHz to 848.31 MHz), PCS 1 900 (1851.25 MHz to 1908.75 MHz), Bluetooth (2 402 MHz to 2 480 MHz) and receives from CDMA 850 (869.70 MHz to 893.31 MHz), PCS 1 900 (1931.25 MHz to 1988.75 MHz), Bluetooth (2 402 MHz to 2 480 MHz).

Model	RM-464
FCC ID	QMNRM-464
IC	661X-RM464
E.U.T NO	A0000001593C24
E.U.T type	Dual-band CDMA phone with BT2.1+EDR
HW Version	4200
SW Version	ST_4020T11_VZW_116
TX frequency	824.70 MHz to 848.31 MHz (CDMA 850) 1851.25 MHz to 1908.75 MHz (PCS 1 900) 2 402 MHz to 2 480 MHz (Bluetooth)
RX frequency	869.70 MHz to 893.31 MHz (CDMA 850) 1931.25 MHz to 1988.75 MHz (PCS 1 900) 2 402 MHz to 2 480 MHz (Bluetooth)
Channel	Middle: 384 (CDMA 850) Middle: 600 (PCS 1 900)

1.2 Related submittal(s) / Grant(s)

Original submittal only.

1.3 Tested system details

All equipment descriptions used in the tested system (including inserted cards) are:

Device type	Manufacturer	Model number/ Part number	FCC ID / DoC	Connected to
Dual-band CDMA phone with BT 2.1 +EDR	Nokia	RM-464	QMNRN-464	Laptop, TA
Laptop	TOSHIBA	PSMA2K-01D002	DoC	E.U.T, TA
Laptop adaptor	DELTA	SADP-65KB B	-	Laptop
Headset	-	HS-9	-	E.U.T
Mouse	MICROSOFT	Intellimouse optical USB and PS/2 compatible	DoC	Laptop
USB cable	-	CA-101	-	E.U.T, Laptop

1.4 Cable description

Product name	Port	Power cord shielded (Y/N)	I/O cable shielded (Y/N)	Length (M)
Dual-band CDMA phone with BT 2.1 +EDR	USB data	Y	Y	(P,D)1.2
	Headset jack	-	N	(D)1.3
Laptop	USB (Mouse)	-	Y	(D)1.8

* The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

1.5 Noise suppression parts on cable. (I/O cable)

Product name	Port	Ferrite bead (Y/N)	Location	Metal hood (Y/N)	Location
Dual-band CDMA phone with BT 2.1 +EDR	USB data	N	-	Y	Both end
	Headset jack	N	-	Y	E.U.T end
Laptop	USB (Mouse)	Y	Laptop end	Y	Laptop end

1.6 Test methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to E.U.T distance of 3 m

1.7 Test facility

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, Maekok-ri, Hobup-myun, Icheon-si, Kyoungki-do, 467-701, Korea. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the commission and accepted dated July 6, 2006(Registration Number: 90661)

1.8 Frequency range of radiated measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
Above 1 000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

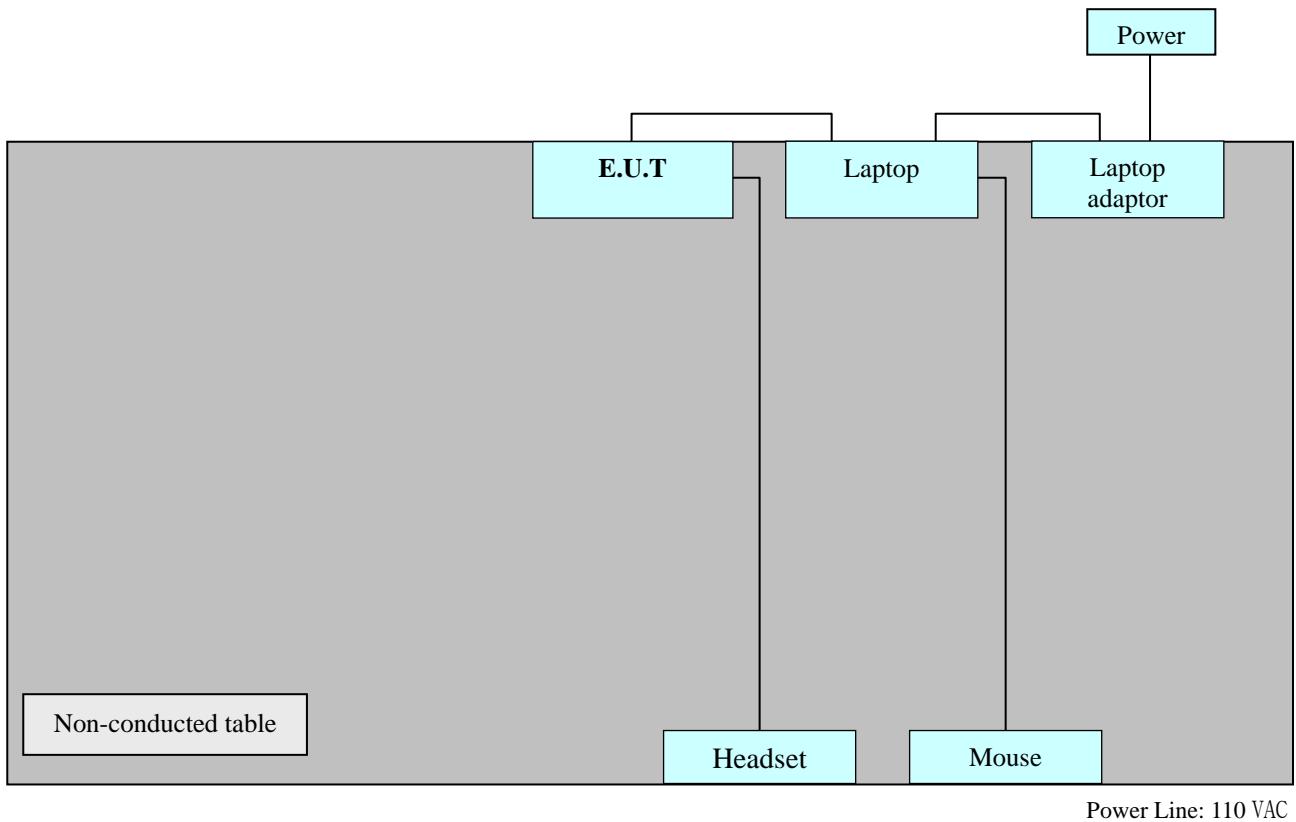
2. SYSTEM TEST CONFIGURATION

2.1 Configuration of test system

Power Line Conducted test : Laptop adaptor was connected to LISN.
Preliminary Power Line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.

Radiated Emission test : Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 3 m open area test site.

[Configuration of Data Communication tested system]



3. PRELIMINARY TEST

3.1 Conducted Emission test

During preliminary tests, the following operating mode was investigated.

■ Data communication mode

: Phone was tested with a laptop connected via USB interface port. After QPST software installed on the computer to be able to communicate with the phone, it was tested by continuously sending a MP3 files to the phone. Phone memory used the internal and external memory.

3. 2 Radiated Emission test

During preliminary test, the following operation mode was investigated.

■ Data communication mode

: Phone was tested with a laptop connected via USB interface port. After QPST software installed on the computer to be able to communicate with the phone, it was tested by continuously sending a MP3 files to the phone. Phone memory used the internal and external memory.

4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

4.1 Conducted Emission test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Limit apply to	: CISPR 22 Class B
Result	: Passed by 4.9 dB
Operating condition	: Data communication mode
Detector	: Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)
Temperature	: 11.2 °C
Humidity level	: 32.3 %
Test date	: March 30, 2009

Power Line Conducted Emissions			CISPR 22 Class B		
Frequency (MHz)	Amplitude (dB μ V)	Conductor	Result	Limit (dB μ V)	Margin (dB)
0.2001	56.0	HOT	Quasi-Peak	64.0	7.6
0.2026	44.8	HOT	Average	54.0	8.7
0.2001	58.7	NEUTRAL	Quasi-Peak	64.0	4.9
0.2001	48.8	NEUTRAL	Average	54.0	4.9

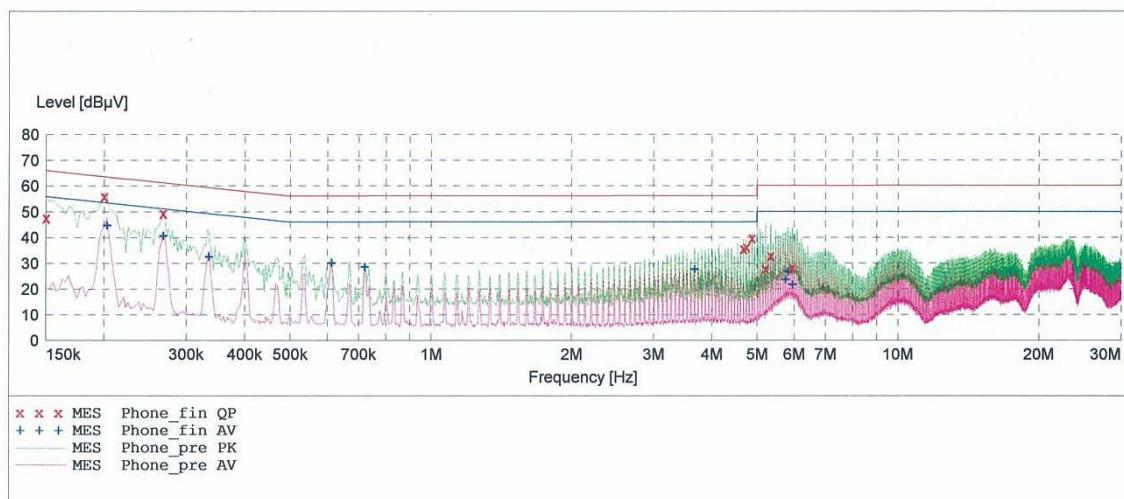
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EMC TEST LAB.

EUT: RM-464
 Manufacturer: Nokia
 Operating Condition: Data communication Mode
 Test Site: SHIELD ROOM
 Operator: YH, LEE
 Test Specification: CISPR 22 CLASS B
 Comment: H

SCAN TABLE: "CISPR 22 Voltage"

CISPR 22 Voltage						
Start Frequency	Stop Frequency	Step Width	Detector	Meas.	IF Time	Transducer
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "Phone_fin QP"

3/30/2009 5:30PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150100	47.60	10.1	66	18.4	---	---
0.200100	56.00	10.1	64	7.6	---	---
0.267600	49.40	10.1	61	11.8	---	---
4.672000	35.60	10.6	56	20.4	---	---
4.740000	36.30	10.6	56	19.7	---	---
4.876000	39.80	10.7	56	16.2	---	---
5.208000	27.90	10.7	60	32.1	---	---
5.344000	33.00	10.7	60	27.0	---	---
5.944000	28.20	10.8	60	31.8	---	---

MEASUREMENT RESULT: "Phone_fin AV"

3/30/2009 5:30PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line ---	PE ---
0.202600	44.80	10.1	54	8.7	---	---
0.267600	40.70	10.1	51	10.5	---	---
0.335100	32.70	10.1	49	16.7	---	---
0.612000	30.20	10.2	46	15.8	---	---
0.720000	28.60	10.2	46	17.4	---	---
3.672000	27.70	10.5	46	18.3	---	---
5.744000	23.80	10.8	50	26.2	---	---
5.812000	26.80	10.8	50	23.2	---	---
5.944000	21.80	10.8	50	28.2	---	---

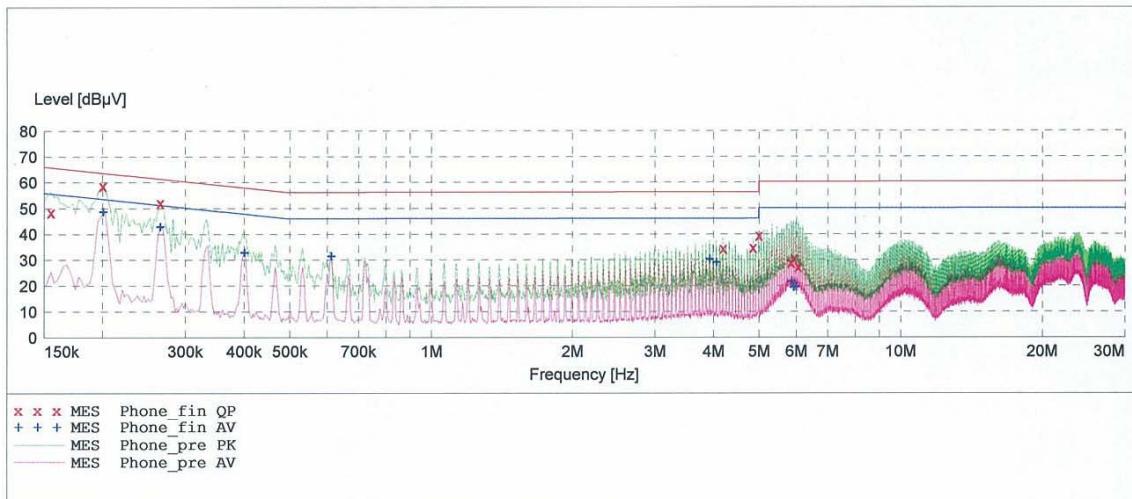
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EMC TEST LAB.

EUT: RM-464
 Manufacturer: Nokia
 Operating Condition: Data communication Mode
 Test Site: SHIELD ROOM
 Operator: YH, LEE
 Test Specification: CISPR 22 CLASS B
 Comment: N

SCAN TABLE: "CISPR 22 Voltage"

Short Description:			CISPR 22 Voltage			
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.1 kHz	500.0 kHz	2.5 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "Phone_fin_QP"

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Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.155100	48.50	10.1	66	17.2	---	---
0.200100	58.70	10.1	64	4.9	---	---
0.265100	52.00	10.1	61	9.3	---	---
4.188000	34.40	10.6	56	21.6	---	---
4.852000	34.70	10.7	56	21.3	---	---
4.988000	39.30	10.7	56	16.7	---	---
5.856000	28.80	10.8	60	31.2	---	---
5.924000	30.60	10.8	60	29.4	---	---
6.056000	27.30	10.8	60	32.7	---	---

MEASUREMENT RESULT: "Phone_fin AV"

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Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line dB	PE
0.200100	48.80	10.1	54	4.9	---	---
0.265100	43.00	10.1	51	8.2	---	---
0.400100	33.00	10.1	48	14.9	---	---
0.612000	31.60	10.2	46	14.4	---	---
3.924000	30.50	10.6	46	15.5	---	---
4.056000	29.30	10.6	46	16.7	---	---
5.856000	21.80	10.8	50	28.2	---	---
5.920000	19.50	10.8	50	30.5	---	---
5.988000	19.80	10.8	50	30.2	---	---

4.2 Radiated Emission test

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

Limit apply to	: FCC PART 15 Subpart B
Result	: Passed by 9.6 dB
Operating condition	: Data communication mode
Detector	: Quasi-Peak (6 dB Bandwidth: 120 kHz)
Temperature	: 11.2 °C
Humidity level	: 32.3 %
Test date	: March 30, 2009

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB μ V	dB /m	dB	(H/V)	dB μ V/m	dB μ V/m	dB
176.0	12.0	11.8	3.2	H	27.0	43.5	16.5
192.0	11.3	10.6	3.3	H	25.2	43.5	18.3
480.0	14.2	17.0	5.2	H	36.4	46.0	9.6
480.0	13.0	17.0	5.2	H	35.2	46.0	10.8

Note)

For measurement over 1 GHz, noise level was more than 10 dB below the limit.

5. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the antenna factor and cable factor.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dB μ V is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dB μ V/m value is mathematically converted to its corresponding level in μ V/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dB}\mu\text{V/m}$$

[Radiated Emission limits]

Frequency of emission (MHz)	Field strength	
	μ V/m	dB μ V/m
30 to 88	100	40.0
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

6. SYSTEM MEASUREMENT UNCERTAINTY

For a 95 % confidence level, the measurement uncertainties for defined system.

6.1 Emissions test

- Radiated Emissions tests : ± 5.6 dB ($k = 2$)
(30 MHz ~ 1 GHz)

- Conducted Emissions tests : ± 3.7 dB ($k = 2$)
(150 kHz ~ 30 MHz)

7. TEST EQUIPMENT

<u>Type</u>	<u>Manufacture</u>	<u>Model number</u>	<u>Next CAL date</u>
EMI Test Receiver	Rohde & Schwarz	ESI40	2009.10.31
EMI Test Receiver	Rohde & Schwarz	ESCI	2009.06.01
LISN	EMCO	703125	2009.05.04
Attenuator	Rohde & Schwarz	ESH3-Z2	2009.10.30
Trilog Antenna	Schwarzbeck	VULB9160	2010.12.18
Communication Antenna	TDK	LPDA-0802	-
Antenna Position Tower	HD	240/520/00	-
Base Station	Rohde & Schwarz	CMU 200	2010.02.17
Horn Antenna	Schwarzbeck	BBHA 9120D	2010.03.26
RF-Amplifier	MITEQ	AMF-6D-00101800-35.20P.PS	2010.04.25
Bluetooth Base Station	TESCOM	TC-3000A	2010.01.09

8. CONCLUSION

The data collected shows that the **Nokia, Inc. Model: RM-464, Dual-band CDMA phone with BT2.1+EDR. FCC ID: QMNRM-464, IC: 661X-RM464** complies with §15.107 and §15.109 of the FCC rules.