



EMI REPORT (DoC)

Nokia Inc.

12278 Scripps Summit Drive
San Diego, CA, 92131

Date of Issue: May 4, 2006

Test Report No.: HCT-SAR06-0503

Test Site: HYUNDAI CALIBRATION & CERTIFICATION
TECHNOLOGIES CO., LTD.

FRN: 0005866421

MODEL

:

Nokia 6215i

Change of contents:

Antenna/ Case have been changed

Classification/ Standard(s):

FCC PART 15 CLASS B / CISPR 22 CLASS B

ICES-003, RSS-132, RSS-133, RSS-210

Equipment (EUT) Type:

Dual- Band CDMA Phone (CDMA/ PCS CDMA) - Prototype

Trade Name/Model(s):

Nokia / Nokia 6215i

Port/ Connector(s)

DC Input Port / Ear Phone Port

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.

HYUNDAI C-Tech. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse of 1988, 21 U.S.C. 853(a).

Report prepared by : Ki-Soo Kim
Manager of Product Compliance Team



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1. GENERAL INFORMATION

1.1 Evaluation Procedure

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz NOKIA QMNRM-214 Phone with PTA-5010C6US Travel Charger.

1.2 Product Description

The **Nokia Inc. Nokia 6215i** Dual-Band (CDMA/ PCS CDMA) phone. Its basic purpose is used for communications. It transmits from CDMA (824.70~848.31), PCS CDMA (1851.25~1908.75) MHz and receives from CDMA (869.70~893.31), PCS CDMA (1931.25~1988.75) MHz. The RF power is rated at CDMA (0.304 W), PCS CDMA (0.275 W).

FCC ID	QMNRM-214
EUT Type	Dual- Band CDMA Phone (CDMA/ PCS CDMA) - Prototype
Model	Nokia 6215i
TX Frequency	824.70 — 848.31 MHz (CDMA) 1851.25 — 1908.75 MHz (PCS CDMA)
RX Frequency	869.70 — 893.31 MHz (CDMA) 1931.25 — 1988.75 MHz (PCS CDMA)
FCC Classification	Licensed Portable Transmitter Held to Ear (PCE)
Max RF. Output Power	0.304W ERP CDMA (24.8dBm) 0.275W EIRP PCS CDMA (24.4dBm)
Modulation	CDMA/ PCS CDMA

1.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

1.3 Tested System Details

The Model names for all equipment, plus descriptions used in the tested system (including inserted cards) are:

DEVICE TYPE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
CDMA Phone	Nokia Inc.	Nokia 6215i	QMNRM-214	Adaptor/ P.C
Adaptor	PANTECH	PTA-5010C6US	N/A	CDMA Phone
Head-Set	Nokia Inc.	-	N/A	EUT
Notebook P.C	TOSHIBA	PSA50K-04007	DoC	N/A
Adapter	TOSHIBA	ADP-60RH A	DoC	Notebook P.C
USB CABLE	PANTECH	PDC-UD-C5	N/A	Notebook P.C
MOUSE	H.P	M-S48a	DoC	P.C
PRINTER	H/P	C4569A	DoC	P.C

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

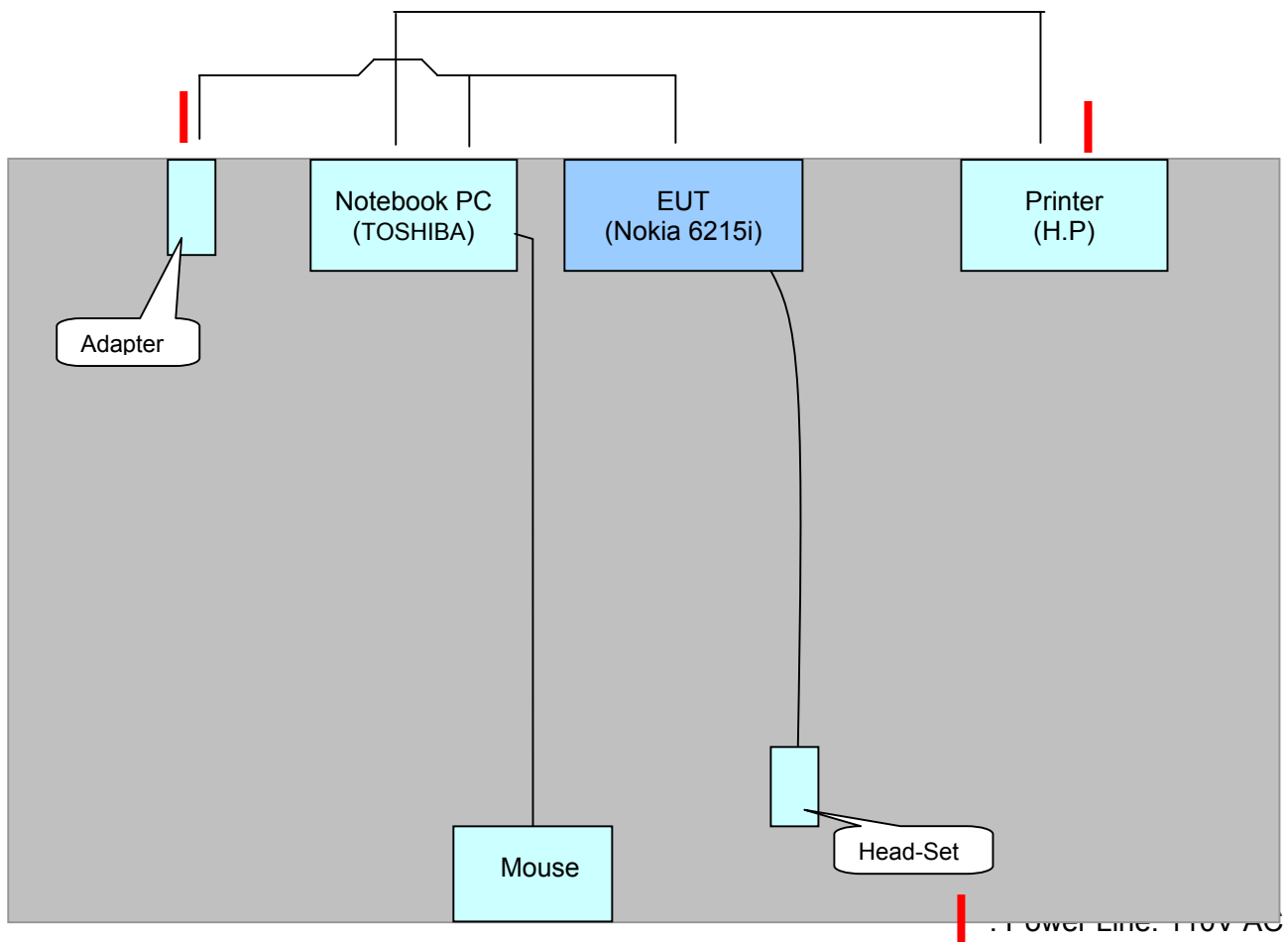
The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, Maekok-Ri, Hobup-Myun, Ichon-Si, Kyoungki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 23, 2003(Registration Number: 90661)

2.SYSTEM TEST CONFIGURATION

2.1 Configuration of Test system

Line Conducted Test : EUT was connected to LISN, all other supporting equipment were Connected to another LISN. Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary Radiated Emissions tests were conducted using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worse perating condition. Final Radiated Emission tests were conducted at 3 meter open area test site.



[Configuration of Tested System]

3. CONDUCTED AND RADIATED EMISSION TESTS SUMMARY

3.1 Conducted Emissions Tests

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

=====

Humidity Level	: 25 %	Temperature: 23.5 °C
Limit apply to	: CISPR 22 CLASS B	
Result	: PASSED BY – 18.7 dB	
Operating Condition	: Idle/ USB Data Transfer	

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 KHz)

Power Line Conducted Emissions				FCC Class B	
Frequency (MHz)	Amplitude (dBuV)	Conductor	Result	Limit (dBuV)	Margin (dB)
0.545	32.8	HOT	Quasi-Peak	56	-23.2
0.545	19.9	HOT	Average	46	-26.1
0.545	36.8	NEUTRAL	Quasi-Peak	56	-19.2
0.545	27.3	NEUTRAL	Average	46	-18.7

Line Conducted Emissions Tabulated Data



Measured by : Keun-Ho Park / Engineer

Date : April 27, 2006

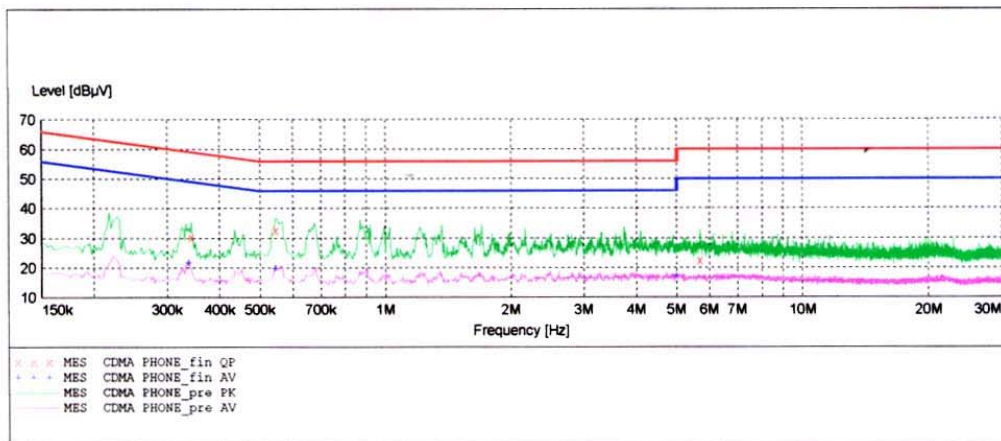
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EMC TEST LAB

EUT: CDMA PHONE
 Manufacturer: NOKIA
 Operating Condition: NORMAL
 Test Site: SHIELD ROOM
 Operator: KEUN-HO PARK
 Test Specification: CISPR 22 CLASS B
 Comment: H

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	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "CDMA PHONE_fin QP"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.342600	30.50	10.1	59	28.6	---	---
0.545000	32.80	10.1	56	23.2	---	---
5.685000	22.70	10.3	60	37.3	---	---

MEASUREMENT RESULT: "CDMA PHONE_fin AV"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.337600	21.80	10.1	49	27.5	---	---
0.545000	19.90	10.1	46	26.1	---	---
5.000000	17.30	10.3	46	28.7	---	---

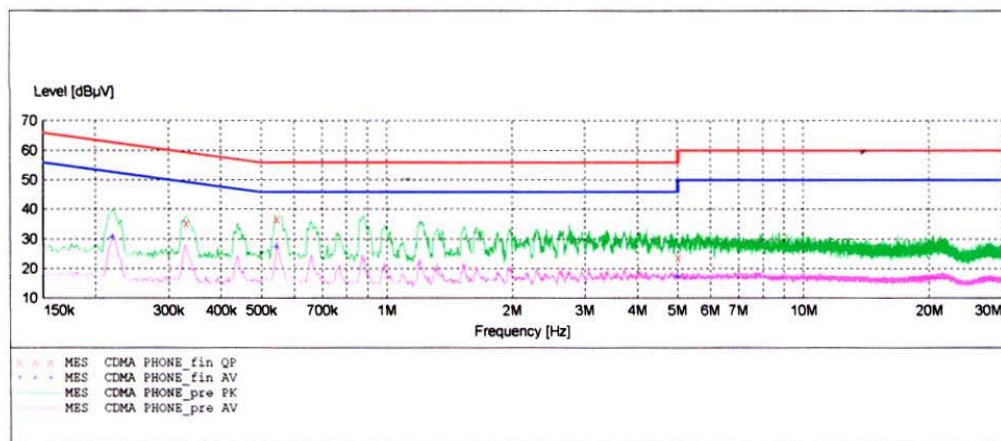
HCT

EMC TEST LAB

EUT: CDMA PHONE
 Manufacturer: NOKIA
 Operating Condition: NORMAL
 Test Site: SHIELD ROOM
 Operator: KEUN-HO PARK
 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	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "CDMA PHONE_fin QP"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.330100	35.50	10.1	59	23.9	---	---
0.545000	36.80	10.1	56	19.2	---	---
5.000000	23.90	10.3	56	32.1	---	---

MEASUREMENT RESULT: "CDMA PHONE_fin AV"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.220100	30.60	10.1	53	22.2	---	---
0.545000	27.30	10.1	46	18.7	---	---
5.000000	17.40	10.3	46	28.6	---	---

3.2 Radiated Emissions Tests

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

=====

Limit apply to : FCC PART 15 CLASS B
 Result : PASSED – 6.4 dB
 Operating Condition : USB Data Transfer
 Detector : Quasi-Peak (Bandwidth: 120 KHz)

Frequency MHz	Reading dBuV	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
88.30	20.7	8.5	2.1	V	31.3	43.5	-12.2
97.00	23.6	9.7	2.2	V	35.5	43.5	-8.0
256.80	16.2	17.6	3.6	V	37.4	46	-8.6
274.10	17.7	18.1	3.8	V	39.6	46	-6.4
325.60	15.9	16.3	4.1	V	36.4	46	-9.6
389.40	14.4	16.8	4.5	V	35.8	46	-10.2
482.50	10.2	18.9	5.0	V	34.1	46	-11.9
256.80	17.0	17.6	3.6	H	38.2	46	-7.8
274.10	14.0	18.1	3.8	H	35.9	46	-10.1
325.60	14.0	16.3	4.1	H	34.5	46	-11.5
389.40	15.1	16.8	4.5	H	36.5	46	-9.5
454.20	11.4	18.5	4.9	H	34.7	46	-11.3

Detector: Average (Bandwidth: 1MHz) / Operating Condition: Idle mode (CDMA 384)

Frequency MHz	Reading dBuV	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
1763.02	10.4	24.3	6.7	V	41.4	54	-12.6

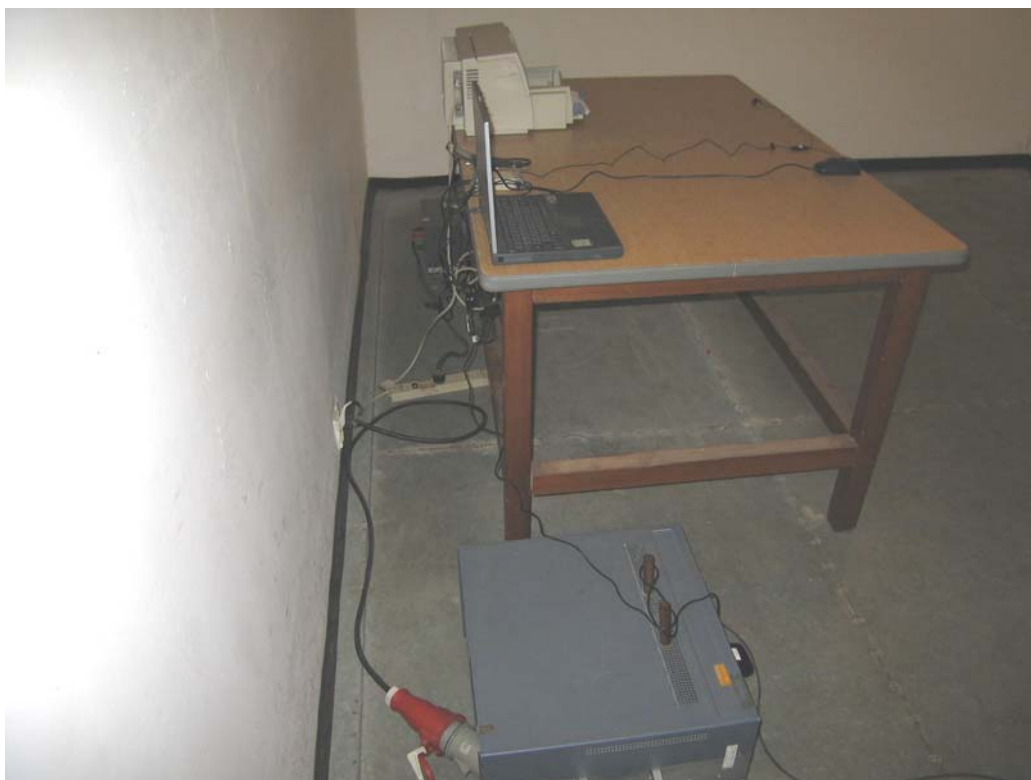
Detector: Average (Bandwidth: 1MHz) / Operating Condition: Idle mode (PCS 600)

Frequency MHz	Reading dBuV	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
1741.98	9.3	25.0	6.6	V	40.9	54	-13.1

Note:

1. All modes of operation were investigated and the worst-case emissions are reported.
2. Measurements using CISPR quasi-peak mode. Above 1GHz, peak detector function mode is used using a resolution bandwidth of 1MHz and a video bandwidth of 1MHz. The peak level complies with the average limit. Peak mode is used with linearly polarized horn antenna and low-loss microwave cable.

3.3.1 Conducted Radiated Emission



3.3.2 Radiated Emission



4.1 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 dBuV is obtained. The Antenna Factor of 7.4 and a Cable Factor of 1.1 is added. The 30 dBuV/m value was mathematically converted to its corresponding level in uV/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dBuV/m}$$

$$\text{Level in uV/m} = \text{Common Antilogarithm} [(30 \text{ dBuV/m})/20] = 31.6 \text{ uV/m}$$

5.1 Test Equipment

Type	Manufacture	Model Number	CAL Date
EMI Test Receiver	Rohde & Schwarz	ES140	2005.11.16
EMI Test Receiver	Rohde & Schwarz	ESVS30	2005.07.16
LISN	Rohde & Schwarz	ESH2-Z5	2005.07.28
LISN	EMCO	ESH3-Z5	2005.07.28
Attenuator	Rohde & Schwarz	ESH3-Z2	2005.11.16
Amplifier	Hewlett-Packard	8447E	2005.08.23
TRILOG Antenna	Schwarzbeck	9160	2006.04.06
Antenna Position Tower	EMCO	1051-12	N/A
Turn Table	EMCO	1060-06	N/A
Power Analyzer	Voltech	PM 3300	2006.02.15
Reference Network Impedance	Voltech	IEC 555	N/A
AC Power Source	PACIFIC	Magnetic Module	N/A
AC Power Source	PACIFIC	360-AMX	2005.11.25
Controller	HD GmbH	HD 100	N/A
SlideBar	HD GmbH	KMS 560	N/A
WIRELESS COMMUNICATION TEST SET	Agilent	E5515C	2006. 5. 3

6.1 Conclusion

The data collected shows that the Nokia Inc. Dual- Band CDMA Phone. FCC ID: QMNRM-214. Complies with §15.107 and §15.109 of the FCC Rules.