ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

UN-INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART B REQUIREMENT

OF

Product Name:	**RM-377**
Brand Name:	**NOKIA**
Model Name:	**RM-377**
Report No.:	**EH/2008/50020**
Issue Date:	**Jun. 16, 2008**
FCC Rule Part:	**Part 15 B, Class B**
Filing Type:	**Certification**
Prepared for:	**Nokia Inc.** **12278 Scripps Summit Dr.** **San Diego, CA 92131, USA**
Prepared by:	**SGS Taiwan Ltd.** **Electronics & Communication Laboratory** **No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan**

Testing Laboratory
0513

VERIFICATION OF COMPLIANCE

Applicant:	Nokia Inc. 12278 Scripps Summit Dr., San Diego, CA 92131, USA
Manufacturer:	Compal Communications (Nanjing) Co. Ltd Nanjing Jiangning Export Processing Zone (South Area) No.68-2 Suyuan Street
Product Name:	RM-377
Brand Name:	NOKIA
Model Name:	RM-377
Model Difference:	N/A
File Number:	EH/2008/50020
Date of test:	May 22, 2008 ~ May 29, 2008
Date of EUT Receive:	May 22, 2008

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15B, Class B. The test results of this report relate only to the tested sample identified in this report.

Test By:	Willis Chen	***Date***	Jun. 16, 2008
	Willis Chen/Senior Supervisor		
Prepared By:	Elisa Chen	***Date***	Jun. 16, 2008
	Elisa Chen/Asst. Supervisor		
Approved By:	Vincent Su	***Date***	Jun. 16, 2008
	Vincent Su/Manager		

Version

Version No.	Date	Description
00	May 29, 2008	Initial creation of document
01	Jun. 16, 2008	DC charger mode and charger mode data removed

Table of Contents

1. GENERAL INFORMATION

1.1 General:

Type Name:	RM-377	
Brand Name:	NOKIA	
Model Name:	RM-377	
Model Difference:	N/A	
Data Cable:	One provided; Model: CA-101	
Simple Hands-Free (SHF):	Two provided; Model: HS-49 and HS-9	
Power Supply:	3.7 Vdc re-chargeable battery or 5Vdc by AC/DC power adapter	
	Battery Model:	BL-4C, Brand: NOKIA
	Adaptor Model:	AC-6 series, Brand: NOKIA

CDMA:

Cellular Phone Standards Frequency Range and Power:	CDMA2000 Band 800	824 MHz– 849MHz	24 dBm
Type of Emission:	1M25F9W		
IMEI:	MEID: 268435456102533764		
Software Version:	KL_2700B_GEN		
Hardware Version:	3000		

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: QMNRM-377** filing to comply with Part15 Subpart B, class B of the FCC CFR 47 Rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-1.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county,which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

1.5 Special Accessories

Not available for this EUT intended for grant.

1.6 Equipment Modifications

Not available for this EUT intended for grant.

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Nokia Celluar CDMA Phone FCC ID:QMNRM-377 Was Tested With a notebook computer connected via USB interface port. The Phone drivers were installed on the computer to be able to communicate with the phone by continuously sending a querying text fele (AT commands) to the phone using HyperTermnial . For more information please see section 5.4 and section 6.5 for test data and APPENDIX 1 for set-up photographs.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

2.3.2 Radiated Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003.

2.4 Limitation

(1) Conducted Emission

According to section 15.107(a) Conducted Emission Class B Limits is as following.

Frequency range MHz	Class B Limits dB (uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

(2) Radiated Emission

According to section 15.109(a) Radiated Emission Class B Limits is as following:

Frequency (MHz)	Field strength μV/m	Distance (m)	Field strength at 3m dBμV/m
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Remark: 1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of 3 meters.

2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System

(Data Link Mode)

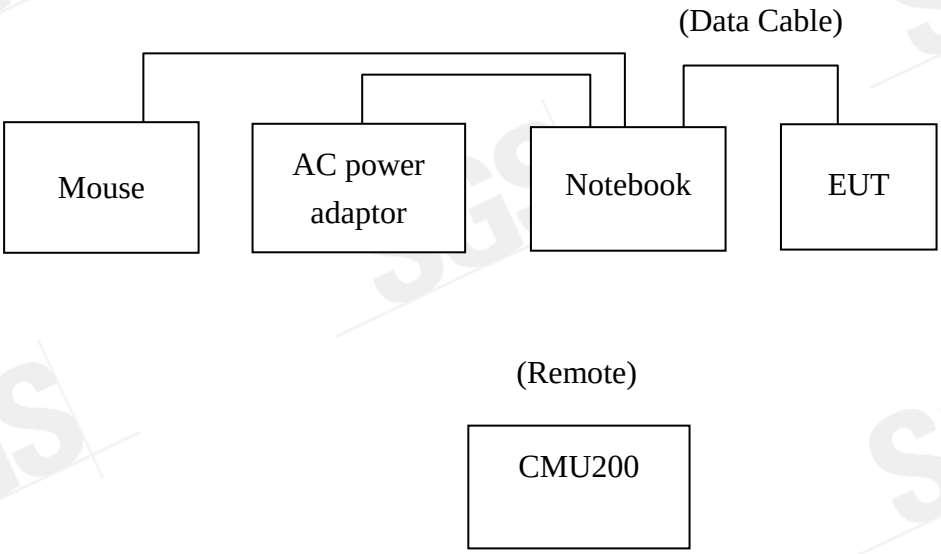


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	EUT	RM-377	RM-377	N/A	N/A	N/A
2.	Battery	NOKIA	BL-4C	N/A	N/A	N/A
3.	USB Cable	NOKIA	CA-101	N/A	shielded	N/A

Table 2-2 Support Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	Notebook PC	IBM	T60	L3DK794	Shielded	Un-shielded
2.	USB Mouse	BENQ	M106-C2W	99Q3188C2W48C044 22SA0000	Shielded,	N/A
3.	Radio Communication Analyzer	R&S	CMU200	102189	Shielded	Un-shielded

3. Summary of Test Results

FCC Rules	Description Of Test	Result
§15.107	Conducted Emission Class B	Compliant
§15.109	Radiated Emission Class B	Compliant

4. Description of test modes

The EUT was stayed in normal operation mode with CMU200.

The data cable was connected to notebook PC and data transferred by program.

Test Plan
Conducted Emission
1. Data link with NB

Radiated Emission
1. Data link with NB

5. Conducted Emissions Test

5.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

5.2 Test SET-UP (Block Diagram of Configuration)

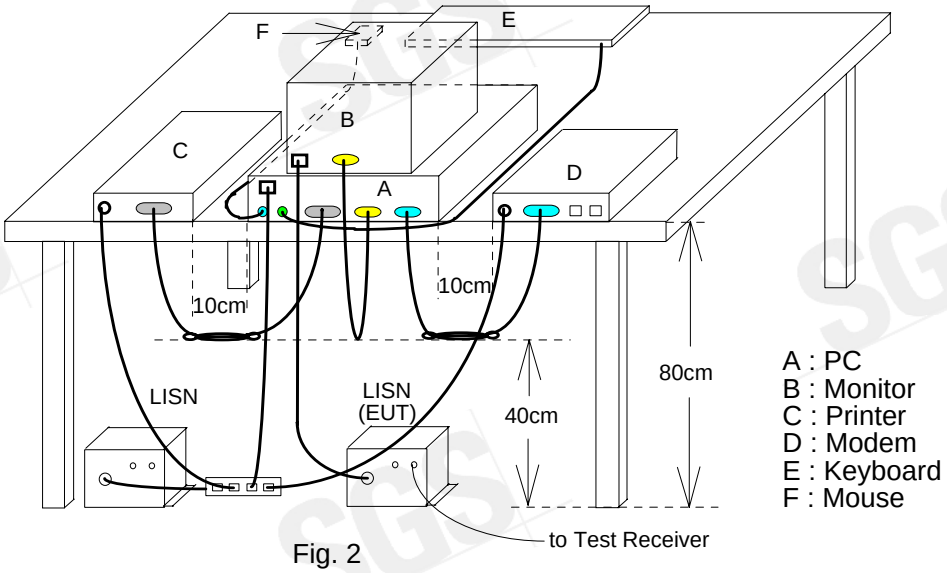


Fig. 2

5.3 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMC Analyzer	HP	8594EM	3624A00203	09/02/2007	09/03/2008
EMI Test Receiver	R&S	ESCS30	828985/004	06/09/2008	06/10/2009
Transient Limiter	HP	11947A	3107A02062	09/02/2007	09/03/2008
LISN	Rolf-Heine	NNB-2/16Z	99012	12/31/2007	12/30/2008
LISN	Rolf-Heine	NNB-2/16Z	99013	01/10/2008	01/09/2009
Coaxial Cables	FCC	FCC-LISN-50/250-25-2-01	04034	01/11/2008	01/10/2009

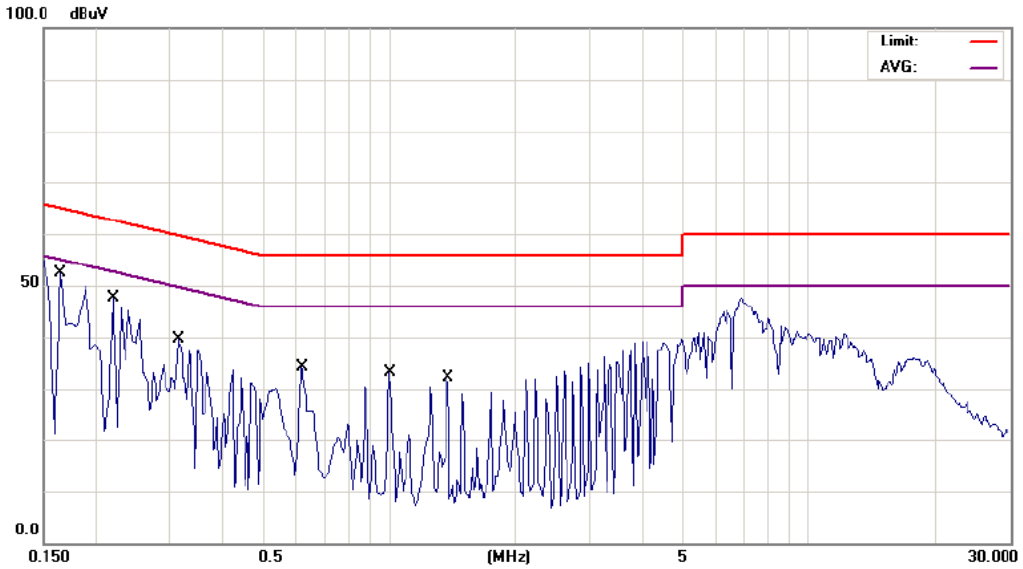
5.4 Measurement Result

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Data LINK with NB			Test Date:	May 28, 2008
Temperature:	26 ℃	Humidity:	58 %	Test By:	Willis

Conducted Emission Measurement



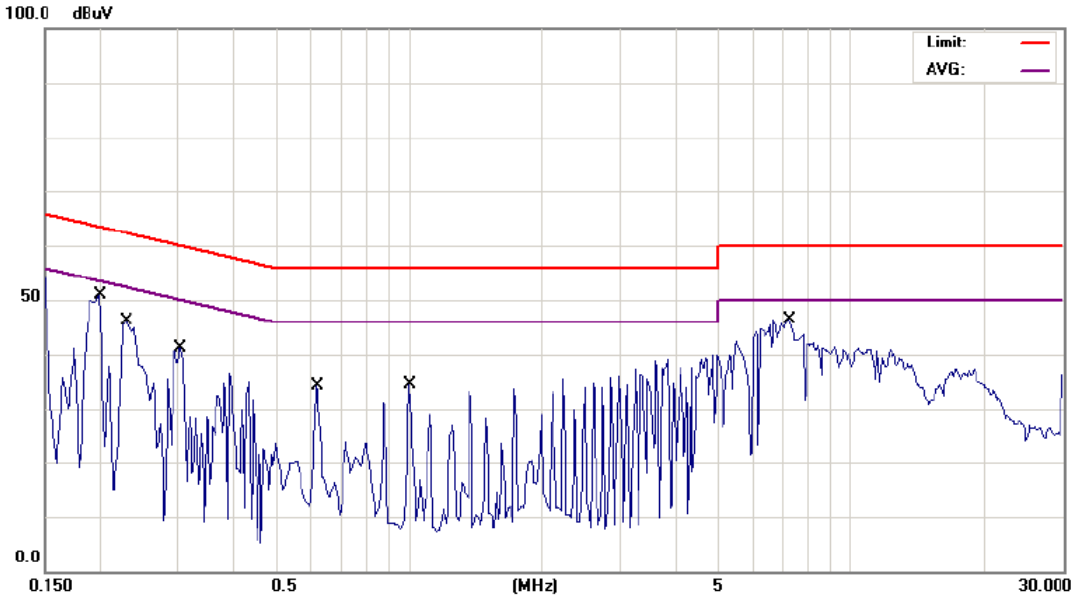
Site SGS CONDUCTED #1
Limit: FCC PART 15B Conduction(QP)
EUT: Mobile Phone
M/N: RM-377
Note: DATA LINK

Phase: L1
Power:
Distance:

Temperature: 26 ℃
Humidity: 58 %
Air Pressure: hpa

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1650	51.98	0.28	52.26	65.21	-12.95	QP	
2		0.1650	23.50	0.28	23.78	55.21	-31.43	AVG	
3		0.2200	47.48	0.11	47.59	62.82	-15.23	QP	
4		0.2200	30.20	0.11	30.31	52.82	-22.51	AVG	
5		0.3150	39.50	0.09	39.59	59.84	-20.25	QP	
6		0.3150	26.50	0.09	26.59	49.84	-23.25	AVG	
7		0.6200	34.08	0.03	34.11	56.00	-21.89	QP	
8		0.6200	20.50	0.03	20.53	46.00	-25.47	AVG	
9		1.0000	33.14	0.01	33.15	56.00	-22.85	QP	
10		1.0000	20.50	0.01	20.51	46.00	-25.49	AVG	
11		1.3800	32.06	0.01	32.07	56.00	-23.93	QP	
12		1.3800	19.50	0.01	19.51	46.00	-26.49	AVG	

Conducted Emission Measurement



Site SGS CONDUCTED #1	Phase: N	Temperature: 26 ℃
Limit: FCC PART 15B Conduction(QP)	Power:	Humidity: 58 %
EUT: Mobile Phone	Distance:	Air Pressure: hpa
M/N: RM-377		
Note: DATA LINK		

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.2000	50.86	0.12	50.98	63.61	-12.63	QP	
2		0.2000	38.10	0.12	38.22	53.61	-15.39	AVG	
3		0.2300	45.98	0.11	46.09	62.45	-16.36	QP	
4		0.2300	23.10	0.11	23.21	52.45	-29.24	AVG	
5		0.3050	41.14	0.09	41.23	60.11	-18.88	QP	
6		0.3050	27.50	0.09	27.59	50.11	-22.52	AVG	
7		0.6200	34.12	0.03	34.15	56.00	-21.85	QP	
8		0.6200	22.50	0.03	22.53	46.00	-23.47	AVG	
9		1.0000	34.40	0.01	34.41	56.00	-21.59	QP	
10		1.0000	21.75	0.01	21.76	46.00	-24.24	AVG	
11		7.2400	46.32	0.05	46.37	60.00	-13.63	QP	
12		7.2400	28.30	0.05	28.35	50.00	-21.65	AVG	

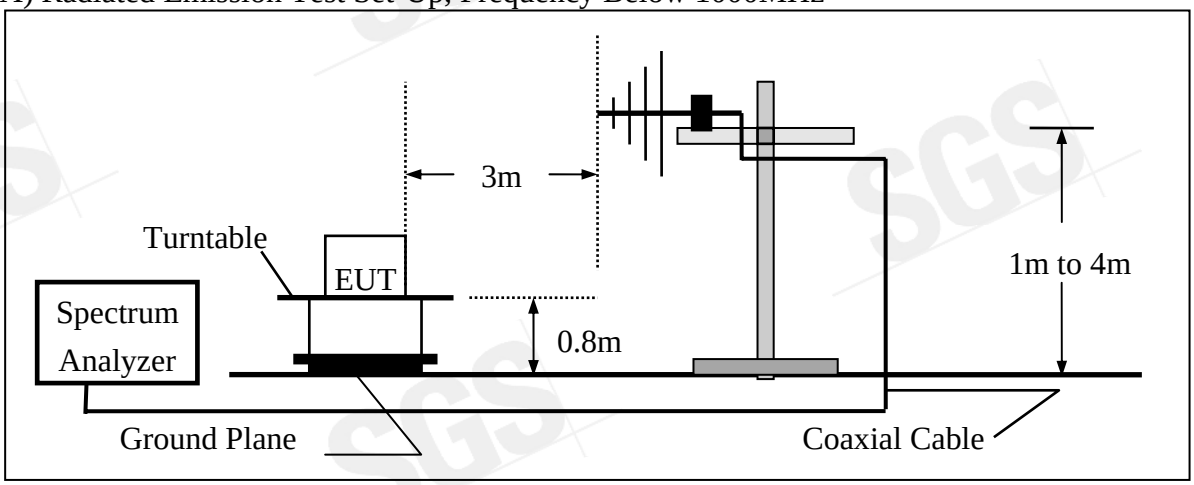
6. Radiated Emission Test

6.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

6.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



6.3 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	E7405A	US41160416	07/04/2007	07/03/2008
Loop Antenna	Messtec	FLA30	03/10086	03/06/2008	03/05/2009
Bilog Antenna	SCHWAZBECK	VULB9160	3224	10/17/2007	10/16/2008
Pre-Amplifier	HP	8447D	2944A09469	07/19/2007	07/18/2008
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	10/09/2007	10/08/2008
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	10/09/2007	10/08/2008
Site NSA	SGS	966 chamber	N/A	11/17/2007	11/16/2008

6.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

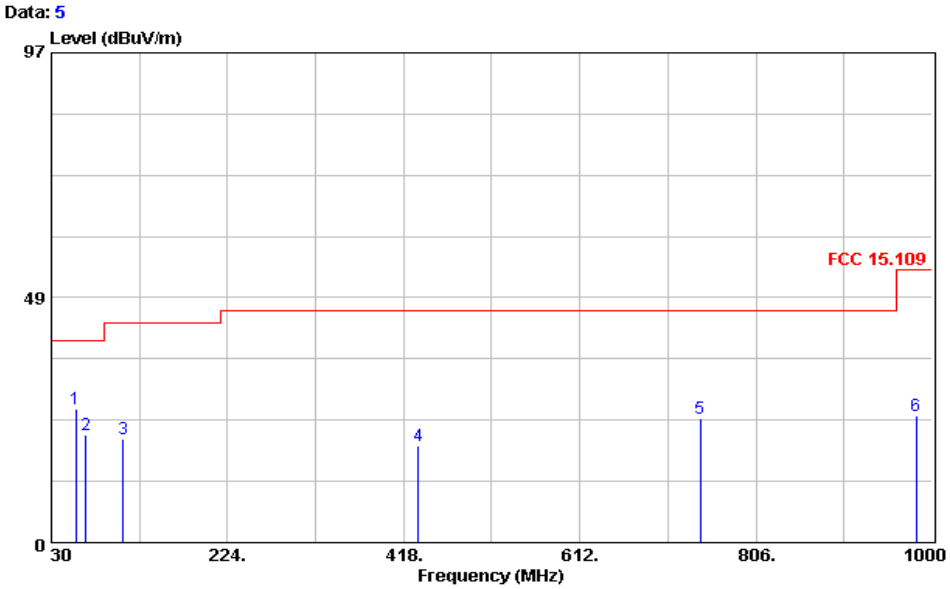
FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

6.5 Measurement Result

Test Mode: Data Link Mode
Frequency Range: 30MHz-10GHz
Temperature : 25 ℃

Test Date : May 13, 2008
Test By: Willis
Humidity : 65 %



Site : RF Site B
Condition : FCC 15.109 3m VULB9168 VERTICAL
eut : EH-2008-50020~21
mode : NOKIA
memo : Mobile Phone
: RM-377
: Data Link
: 25/65
: Willis

	Freq	ReadAntenna Level	Factor	Preamp Factor	Cable Loss	Level	Factor	Limit Line	Over Limit	Remar
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB/m	dBuV/m	dB	
1	57.16	53.13	12.91	40.08	0.50	26.46	-26.67	40.00	-13.54	QP
2	67.83	50.24	11.21	40.89	0.76	21.32	-28.92	40.00	-18.68	QP
3	109.54	49.93	11.13	41.47	0.83	20.42	-29.51	43.50	-23.08	QP
4	434.49	44.33	15.58	42.70	1.88	19.09	-25.24	46.00	-26.91	QP
5	744.89	45.38	20.20	43.54	2.61	24.65	-20.73	46.00	-21.35	QP
6	982.54	43.48	22.22	43.59	3.01	25.12	-18.36	54.00	-28.88	QP

Remark：

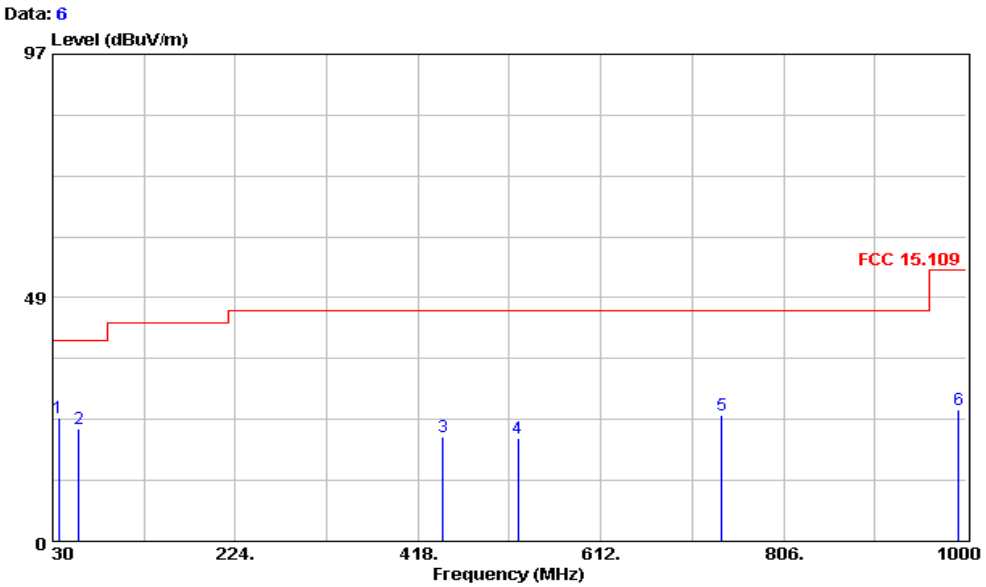
(1) Measuring frequencies from 30 MHz to the 10GHz。

(2) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurement as necessary.

(3) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

(4) The IF bandwidth of SPA 30MHz to 1GHz was 100KHz and 1GHz to 10GHz was 1MHz

Test Mode:	Data Link Mode	Test Date :	May 13, 2008
Frequency Range:	30MHz-10GHz	Test By:	Willis
Temperature :	25 ℃	Humidity :	65 %



Site : RF Site B
Condition : FCC 15.109 3m VULB9168 HORIZONTAL
eut : EH-2008-50020~21
mode : NOKIA
memo : Mobile Phone
: RM-377
: Data Link
: 25/65
: Willis

	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Factor	Limit Line	Over Limit	Remar
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dB/m	dBuV/m	dB	
1	36.79	50.54	13.39	39.80	0.47	24.60	-25.94	40.00	-15.40	QP
2	58.13	49.09	12.91	40.08	0.50	22.42	-26.67	40.00	-17.58	QP
3	444.19	46.08	15.82	42.88	1.91	20.93	-25.15	46.00	-25.07	QP
4	523.73	44.93	16.93	43.37	2.18	20.67	-24.26	46.00	-25.33	QP
5	740.04	45.99	20.15	43.54	2.61	25.21	-20.78	46.00	-20.79	QP
6	992.24	44.15	22.22	43.70	3.58	26.25	-17.90	54.00	-27.75	QP

Remark：

(1) Measuring frequencies from 30 MHz to the 10GHz。

(2) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurement as necessary.

(3) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 10dB below the permissible limits or the field strength is too small to be measured.

(4) The IF bandwidth of SPA 30MHz to 1GHz was 100KHz and 1GHz to 10GHz was 1MHz