

FCC PART 15B
MEASUREMENT AND TEST REPORT
FOR

SK NETWORKS CO., LTD

198, Ulchiro 2Ga, Chung-Gu, Seoul, Korea

FCC ID: ZIDI660

Report Concerns: Original Report	Equipment Type: GSM mobile phone
Model:	<u>i660</u>
Report No.:	<u>STR11048218I-3</u>
Test Date:	<u>2011-04-25 to 2011-05-16</u>
Issue Date:	<u>2011-05-18</u>
Tested By:	<u>Seven Song / Engineer</u> <i>Seven Song</i>
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: SK NETWORKS CO., LTD
Address of applicant: 198, Ulchiro 2Ga, Chung-Gu, Seoul, Korea

Manufacturer: Shenzhen Phone-talk Technology Co., Ltd
Address of manufacturer: Room 1805, Tower A, Phrase I, Tian An High-tech Plaza,
Futian District, Shenzhen, China

General Description of E.U.T

Items	Description
EUT Description:	GSM mobile phone
Trade Name:	e-dia
Model No.:	i660
IMEI:	358865030616985, 358865030632289
Hardware Version:	F118I66MOVISTARCV01.01b03
Software Version:	F118_MB_P3.0
Rated Voltage:	Battery DC 3.7V, Adapter DC USB 5V
Frequency range:	GSM/GPRS 850: 824~849MHz GSM/GPRS 1900: 1850~1910MHz Bluetooth: 2402~2480MHz
Rated Voltage:	Battery DC 3.7V, 120V Adapter DC5V
Rated Current:	2A
Size:	11.0X5.8X1.1cm

The test data is gathered from a production sample, provided by the manufacturer.

1.2 Test Standards

The following report is prepared on behalf of the SK NETWORKS CO., LTD in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15.107, and 15.109 rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in

the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Test Facility

- **FCC – Registration No.: 994117**

SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

- **Industry Canada (IC) Registration No.: 7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Electronics Service Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

1.5 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components. The test software, provided by the customer, is started while the EUT is on to simulate the normal work. under the Windows XP terminal.

1.6 Accessories Equipment List and Details

Description	Manufacturer	Model	Serial Number
Notebook	ASUS	X50	/
/	/	/	/

1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
USB Cable	1.0	Shielded	Without Core
Earphone Cable	1.4	Unshielded	Without Core

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.107 (a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

3. §15.107 (a)- CONDUCTED EMISSION

3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2010-12-20	2011-12-19
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2010-12-20	2011-12-19
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2010-12-20	2011-12-19

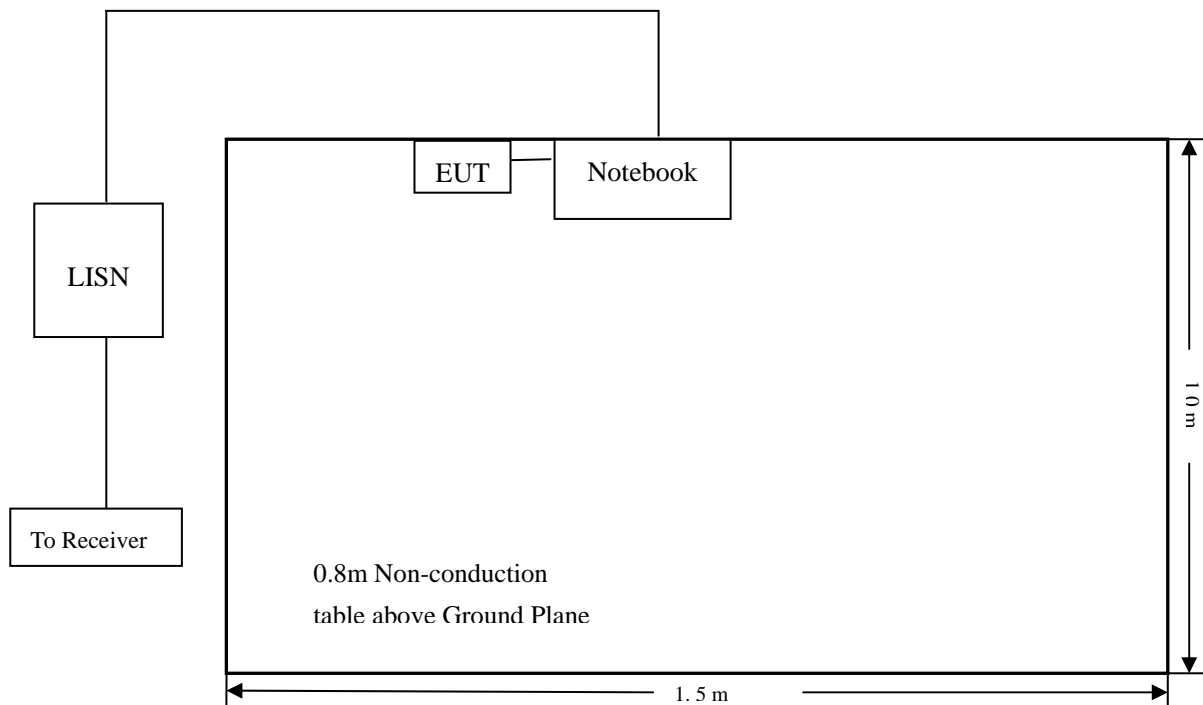
3.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

3.4 Basic Test Setup Block Diagram



3.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

3.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency 150 kHz
 Stop Frequency..... 30 MHz
 Sweep Speed Auto
 IF Bandwidth..... 10 kHz
 Quasi-Peak Adapter Bandwidth 9 kHz
 Quasi-Peak Adapter Mode Normal

3.7 Summary of Test Results/Plots

According to the data in section 3.8, the EUT complied with the FCC 15B Conducted margin for a Class B device, with the *worst* margin reading of:

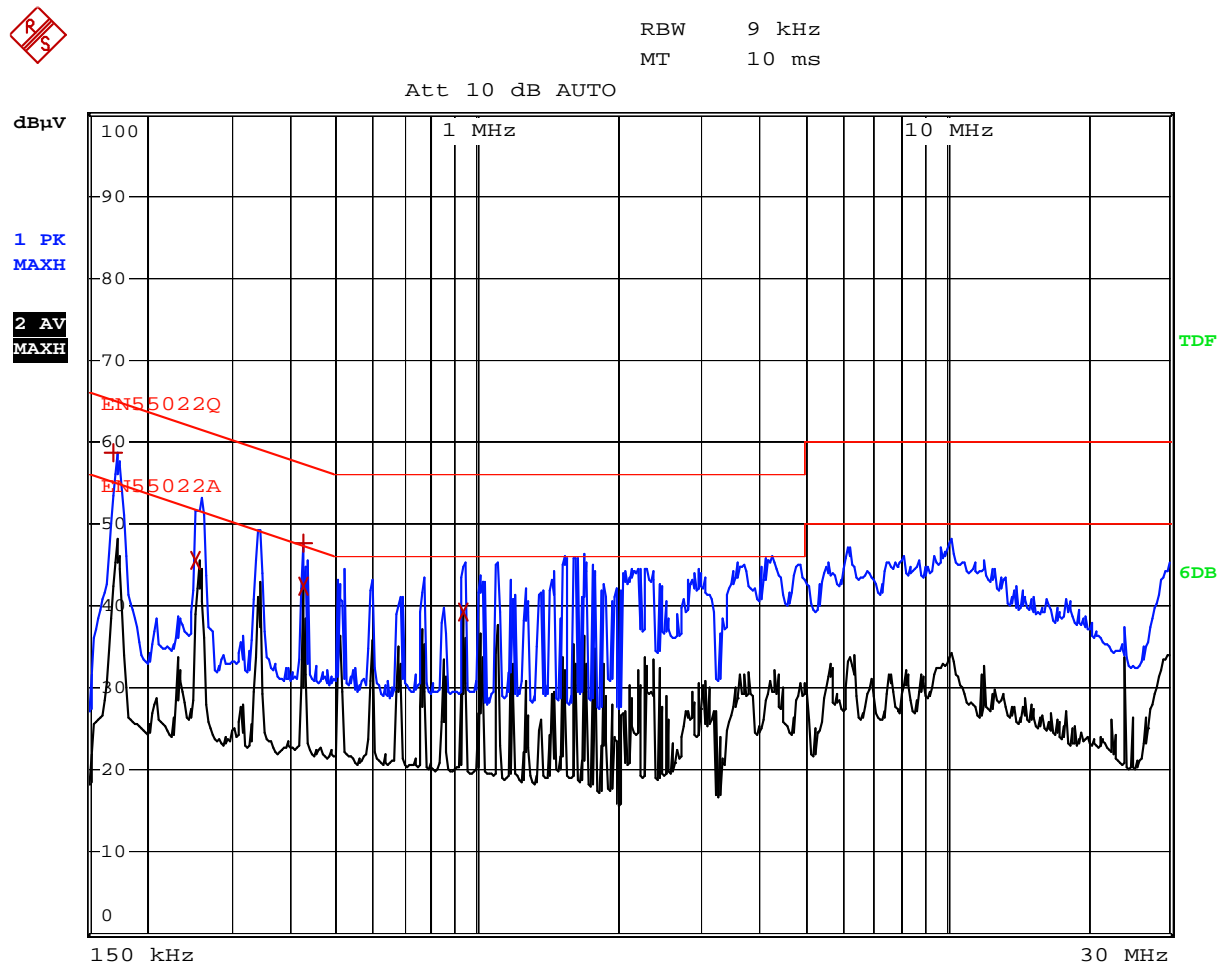
-3.7 dB μ V at 0.170 MHz in the Line mode, Peak detector, 0.15-30MHz

3.8 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC PART15B CLASS B	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Pk	Line/Neutral	dB μ V	dB
0.170	61.23	Peak	Line	64.96	-3.7
0.426	42.42	Ave	Neutral	47.33	-4.9
0.258	46.50	Ave	Line	51.50	-5.0
0.254	45.49	Ave	Neutral	51.63	-6.1
0.170	58.59	Peak	Neutral	64.96	-6.4
0.934	39.30	Ave	Neutral	46.00	-6.7
10.582	53.22	Peak	Line	60.00	-6.8
0.430	39.60	Ave	Line	47.25	-7.7
0.422	48.98	Peak	Line	57.41	-8.4
0.426	47.65	Peak	Neutral	57.33	-9.7
4.914	45.16	Peak	Line	56.00	-10.8

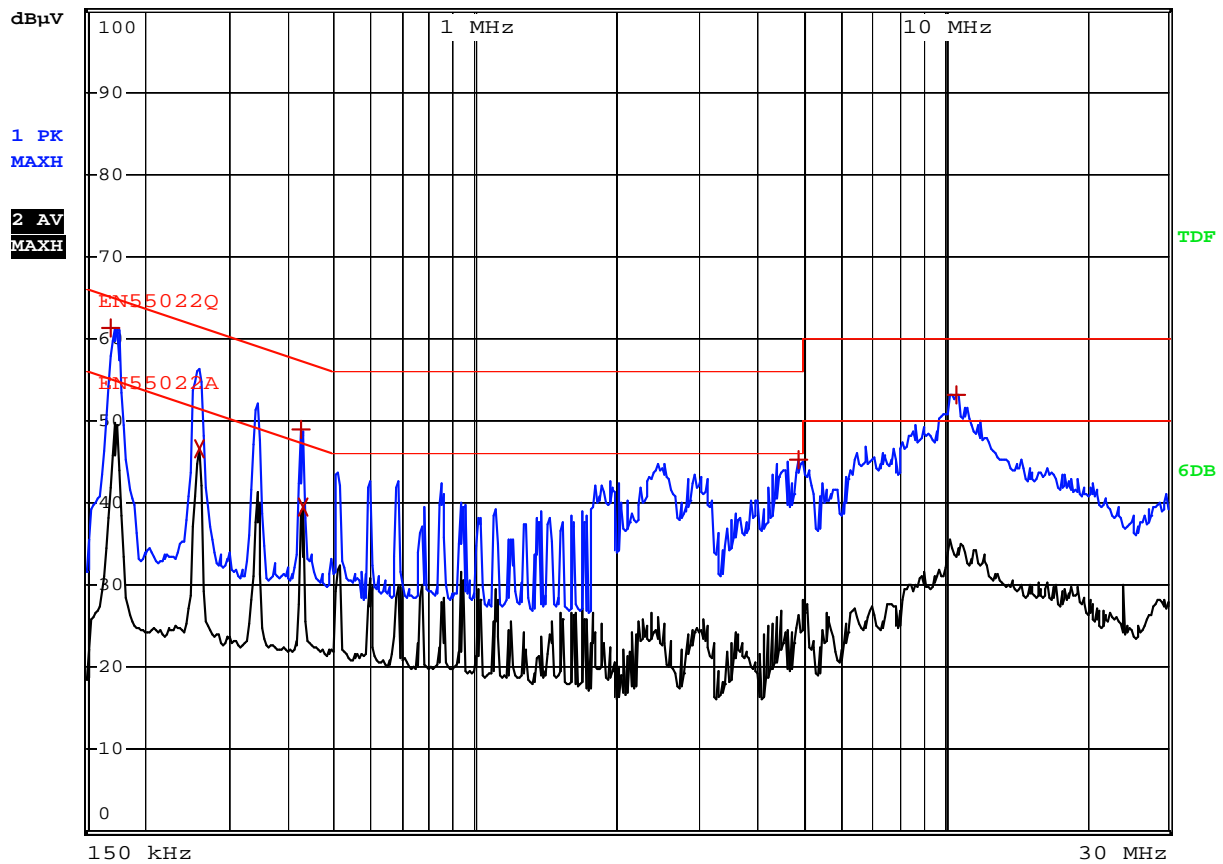
Plot of Conducted Emissions Test Data

Conducted Disturbance
EUT: GSM mobile phone
M/N: i660
Operating Condition: Running with Program
Test Specification: N
Comment: AC 120V/60Hz Adapter USB 5V



Plot of Conducted Emissions Test Data*Conducted Disturbance**EUT: GSM mobile phone**M/N: i660**Operating Condition: Running with Program**Test Specification: L**Comment: AC 120V/60Hz Adapter USB 5V*RBW 9 kHz
MT 10 ms

Att 10 dB AUTO



4. §15.109(a)- RADIATED EMISSION

4.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is ± 5.10 dB.

4.2 Test Equipment List and Details

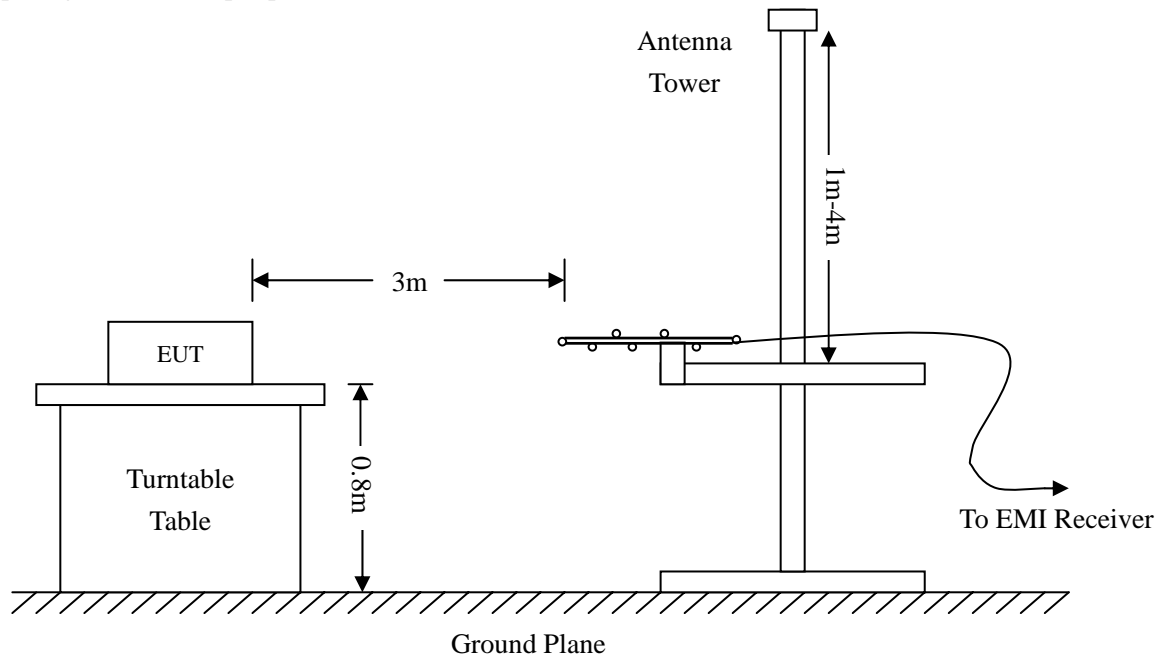
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-12-20	2011-12-19
EMI Test Receiver	R&S	ESVB	825471/005	2010-12-20	2011-12-19
Positioning Controller	C&C	CC-C-1F	N/A	2010-12-20	2011-12-19
RF Switch	EM	EMSW18	SW060023	2010-12-20	2011-12-19
Pre-amplifier	Agilent	8447F	3113A06717	2010-12-20	2011-12-19
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-12-20	2011-12-19
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2011-01-09	2012-01-08
Horn Antenna	ETS	3117	00086197	2011-01-09	2012-01-08

4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 and FCC Part 15.109 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



4.4 Test Receiver Setup

During the radiated emission test, the test receiver was set with the following configurations:

Start Frequency 30 MHz
 Stop Frequency..... 1000 MHz
 Sweep Speed Auto
 IF Bandwidth..... 100 kHz
 Quasi-Peak Adapter Bandwidth 120 kHz
 Quasi-Peak Adapter Mode Normal

4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15B Limit}$$

4.6 Environmental Conditions

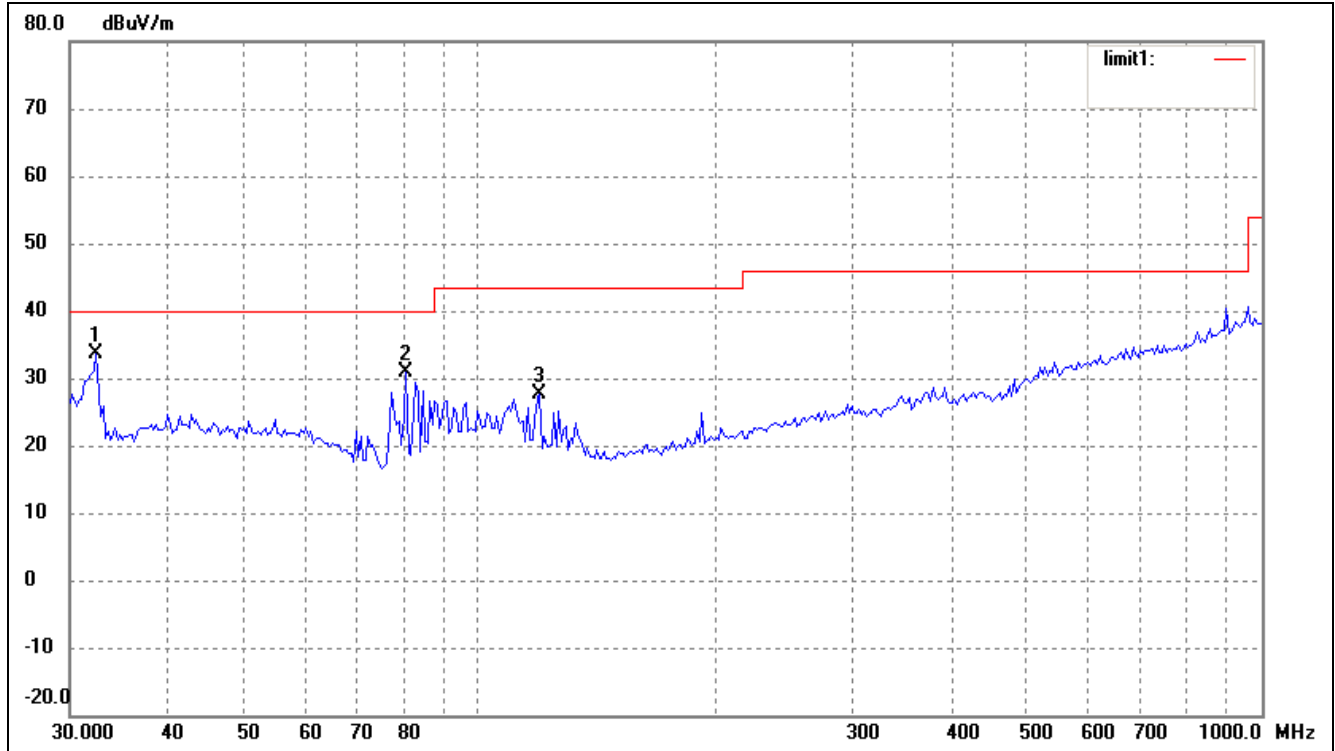
Temperature:	25 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

4.7 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC 15B Class B standards, and had the worst margin of:

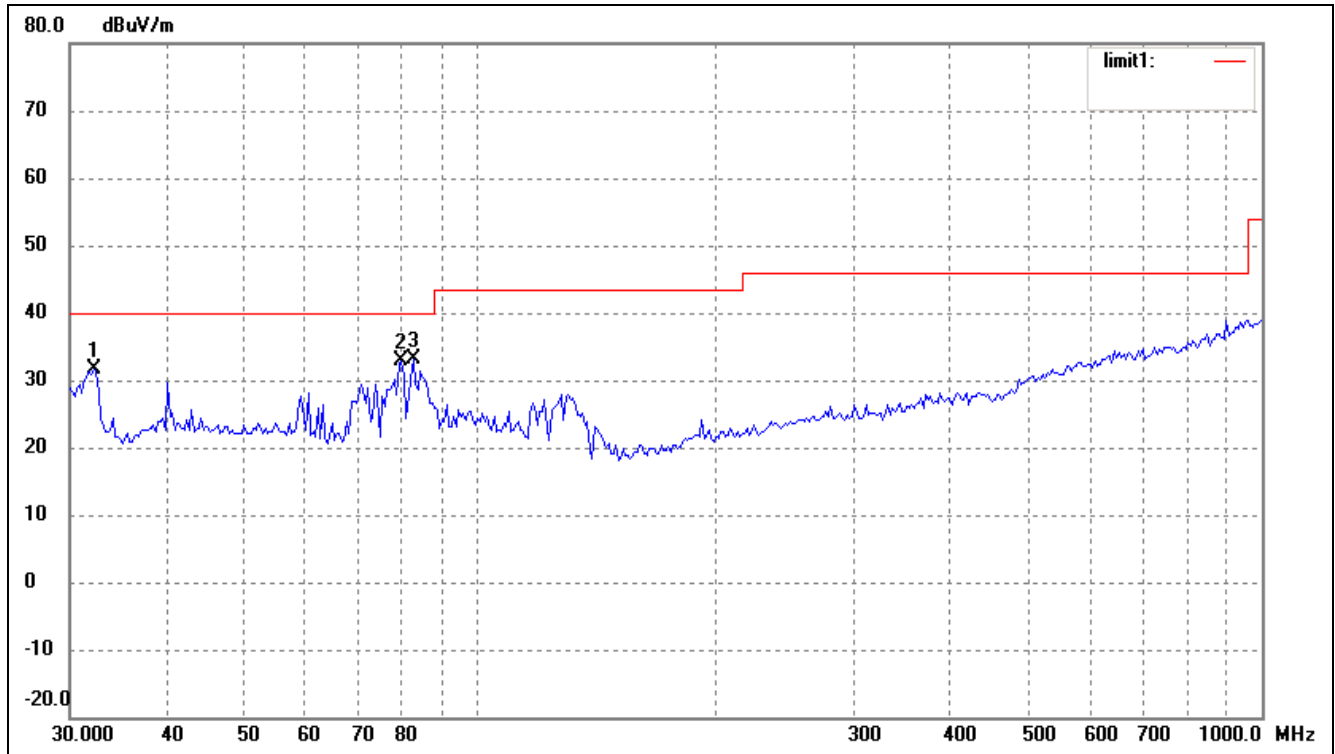
-6.49 dB μ V at 32.4059MHz in the Horizontal polarization Charging& Multimedia Playing, 30 MHz to 1 GHz, 3Meters

-1.85 dB μ V at 339.5888MHz in the Horizontal polarization Downloading Mode, 30 MHz to 1 GHz, 3Meters

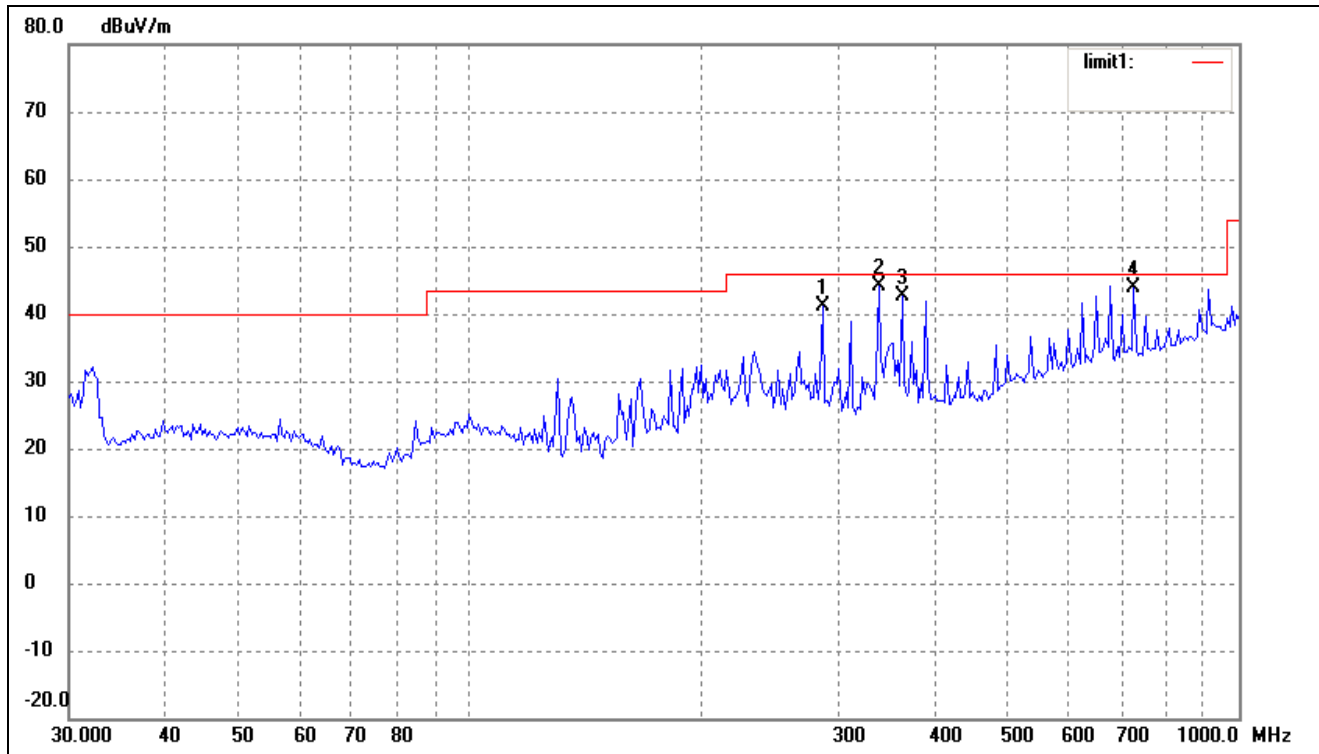
Plot of Radiation Emissions Test Data*Radiated Disturbance**EUT: GSM mobile phone**M/N: i660**Operating Condition: Charging & Multimedia Playing**Test Specification: Horizontal & Vertical**Comment: AC 120V/60Hz Adapter USB 5V***Horizontal**

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.4059	26.74	6.77	33.51	40.00	-6.49	136	100	peak
2	80.6442	26.90	3.87	30.77	40.00	-9.23	263	100	peak
3	119.4361	21.51	6.04	27.55	43.50	-15.95	360	200	peak

Vertical

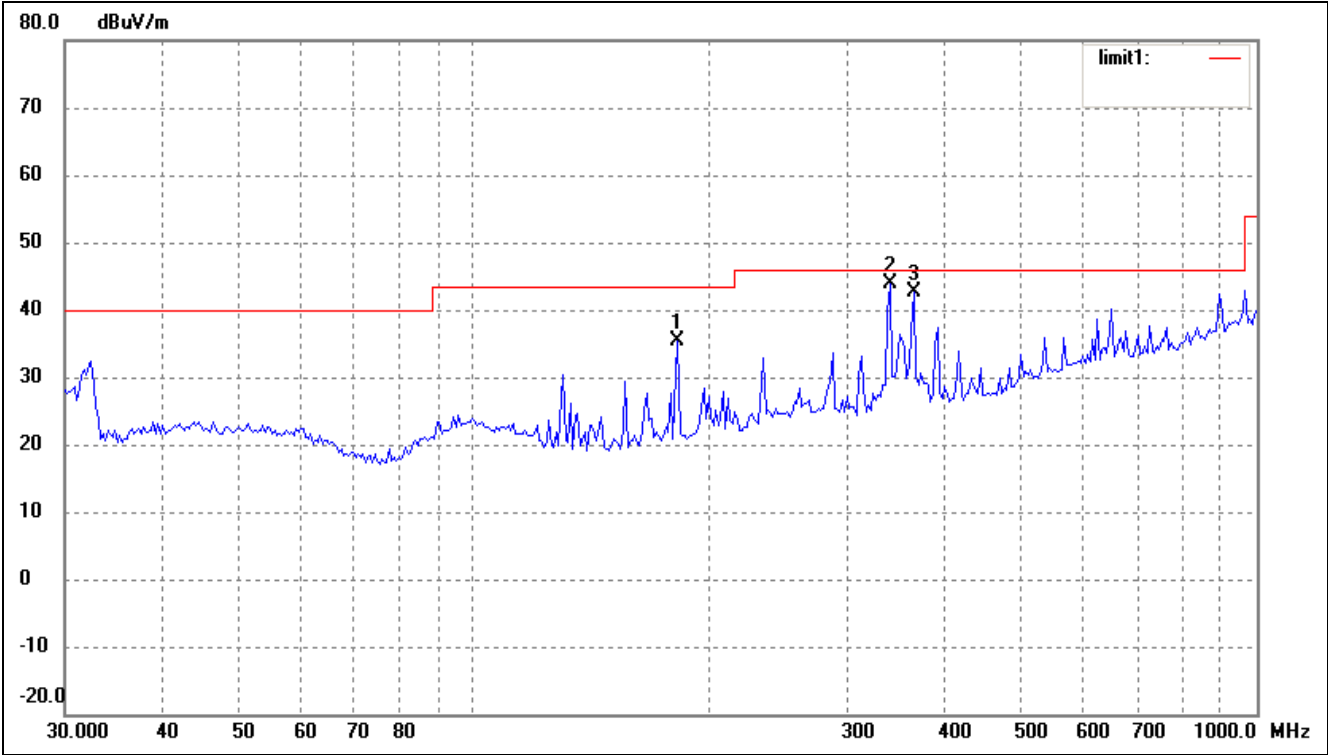


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	32.1795	24.93	6.77	31.70	40.00	-8.30	56	100	peak
2	79.5209	29.25	3.55	32.80	40.00	-7.20	79	100	peak
3	82.3588	28.58	4.49	33.07	40.00	-6.93	168	100	peak

*Radiated Disturbance**EUT: GSM mobile phone**M/N: i660**Operating Condition: Downloading**Test Specification: Horizontal & Vertical**Comment: Connect to PC Downloading**Horizontal*

No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	286.9823	31.57	9.61	41.18	46.00	-4.82	122	100	peak
2	339.5888	33.73	10.42	44.15	46.00	-1.85	235	100	peak
3	364.2595	31.69	10.96	42.65	46.00	-3.35	360	100	peak
4	729.3583	26.06	17.94	44.00	46.00	-2.00	360	100	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	181.9202	29.57	5.81	35.38	43.50	-8.12	152	100	peak
2	339.5887	33.36	10.42	43.78	46.00	-2.22	360	200	QP
3	364.2595	31.55	10.96	42.51	46.00	-3.49	100	100	QP

***** END OF REPORT *****