

# TEST REPORT

## 1. Applicant

**Name** : XLmobile  
**Address** : #905, Byucksan digital vally V, Gasan-dong, Geumchen-gu,  
Seoul, KOREA

## 2. Products

**Name** : Dual band GSM phone  
**Model/Type** : S20 / SU770  
**Manufacturer** : XLmobile

**3. Test Standard** : FCC CFR 47 Part 15, Subpart B

**4. Test Method** : ANSI C63.4-2003

**5. Test Result** : Positive

**6. Date of Application** : February 12, 2009

**7. Date of Issue** : April 17, 2009

**Tested by**

*Sung-kyu Cho*

Sung-kyu Cho

Telecommunication Center  
Engineer

**Approved by**

*Jeong-min Kim*

Jeong-min Kim

Telecommunication Center  
Manager

*The test results contained apply only to the test sample(s) supplied by the applicant, and this test report shall not be reproduced in full or in part without approval of the KTL in advance.*

## Korea Testing Laboratory

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## 1. GENERAL INFORMATION

### 1.1. Applicant (Client)

Name	XLmobile
Address	#905, Byucksan digital vally V, Gasan-dong, Geumchen-gu
Contact Person	Brad, Choi
Telephone No.	070-7122-7766
Facsimile No.	+82-2-2082-5898
E-mail address	Brad.choi@xlmobile.co.kr
Manufacturer Name	XLmobile
Manufacturer Address	#905, Byucksan digital vally V, Gasan-dong, Geumchen-gu

### 1.2. Equipment (EUT)

Type of equipment	Dual band GSM phone USB MODEM
Model Name	S20 / SU770
FCC ID	XACXLMS20
FCC Classification	JBP (Part 15 Class B Computing Device Peripheral)
Mode	GSM850/GSM1900
Tx frequency Band	824.2 ~ 848.8 MHz (GSM850) 1850.2 ~ 1909.8 MHz (GSM1900) 2402 ~ 2480 (Bluetooth)
Rx frequency Band	869.2 ~ 893.8 MHz (GSM850) 1930.2 ~ 1989.8 MHz (GSM1900) 2402 ~ 2480 (Bluetooth)
Hardware Version	1.0
Software Versio	open.850d.016

### 1.3. Testing Laboratory

Testing Place	Korea Testing Laboratory (KTL) 1271-12, Sa-Dong Sangnok-Gu, Ansan-si Gyunggi-Do , Korea
FCC registration number	408324
Industry Canada filing number	6298
Test Engineer	Sung-kyu Cho
Telephone number	+82 31 5000 132
Facsimile number	+82 31 5000 159
E-mail address	skcho@ktl.re.kr
Other Comments	-

## 2. SUMMARY OF TEST RESULTS

Testing performed for : XLmobile

Equipment Under Test : S20 / SU770

Receipt of Test Sample : 2009 .02. 12

Test Start Date : 2009. 02. 25

Test End Date : 2009. 02. 28

The following table represents the list of measurements required under the FCC CFR47 Part 15.107 and 15.109

FCC Rules	Test Requirements	Result	Comments
15.107	AC conducted Emission	Pass	See Data sheets
15.109(a)	Radiated Emission	Pass	See Data sheets

**Note 1** : Test results reported in this document relate only to the items tested

**Note 2** : The required tests demonstrated compliance as per client declaration of test configuration, monitoring methodology and associated pass/fail criteria

**Note 3** : Test results apply only to the item(s) tested

**\* Modifications required for compliance**

No modifications were implemented by KTL.

All results in this report pertain to the un-modified sample provided to KTL.

## 3. Measurement & Results

### 3.1. AC Conducted Emissions

#### 3.1.1. Test Procedure

Conducted emission measurements on the EUT were performed by "AC Power Line Conducted Emissions Testing" procedure as per ANSI C63.4. The EUT was set up on a wooden table 0.8 meters height, 1.0 by 1.5 meters in size, placed in the shielded enclosed with a side of wall of which constituted a vertical conducting surface of 2.2 m x 3.1 m in size to maintain 40 cm from the rear of EUT

LISN(Line Impedance Stabilization Network, ROHDE & SCHWARZ, ESH3-Z5, 50 ohm / 50  $\mu$ H) was installed and electrically boned to the conducting ground plane. The EUT was connected to the LISN using a typical power adapter.

One of two 50 ohm output terminals of the LISN was connected to the EMI Receiver (ROHDE & SCHWARZ, ESCI, 9 kHz to 3 GHz) and the other was terminated in 50 ohms. Measurements were again performed after interchanging such a connection oppositely.

The frequency range from 150 kHz to 30 MHz was examined and the remarkable frequencies were measured with Quasi-peak and Average values using the EMI receiver instrument (ROHDE & SCHWARZ, ESIB, 9 kHz to 26.5 GHz ; Detector Function ; CISPR Quasi-Peak & Average). The 6 dB bandwidth of the Receiver was set to 9 kHz

The position of connecting cables of the EUT was changed to find the worst case configuration during measurements. The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

#### 3.1.2. Limits

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency (MHz)	Conducted Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

- Decreases with the logarithm of the frequency.

### 3.1.3. Sample calculation

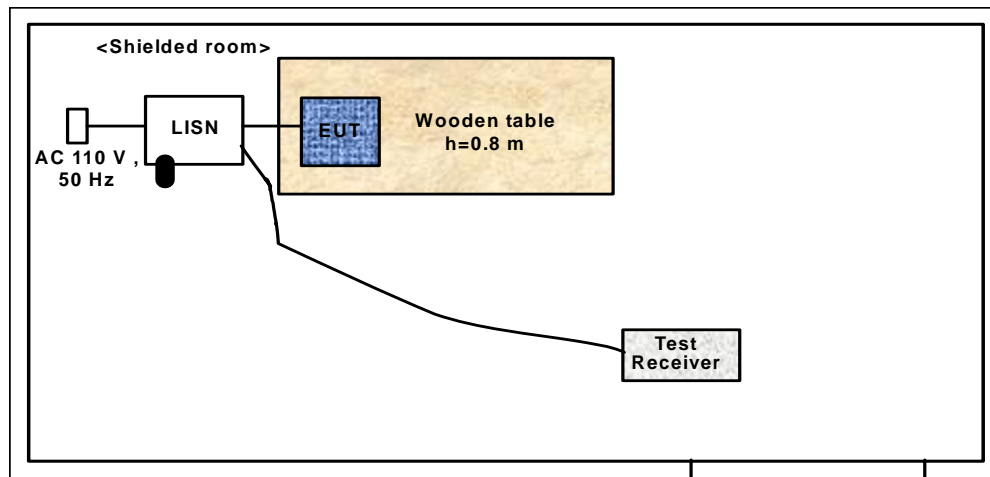
The emission level measured in decibels above one microvolt (dB $\mu$ V) was converted into microvolt ( $\mu$ V) as shown in following sample calculation.

For example :

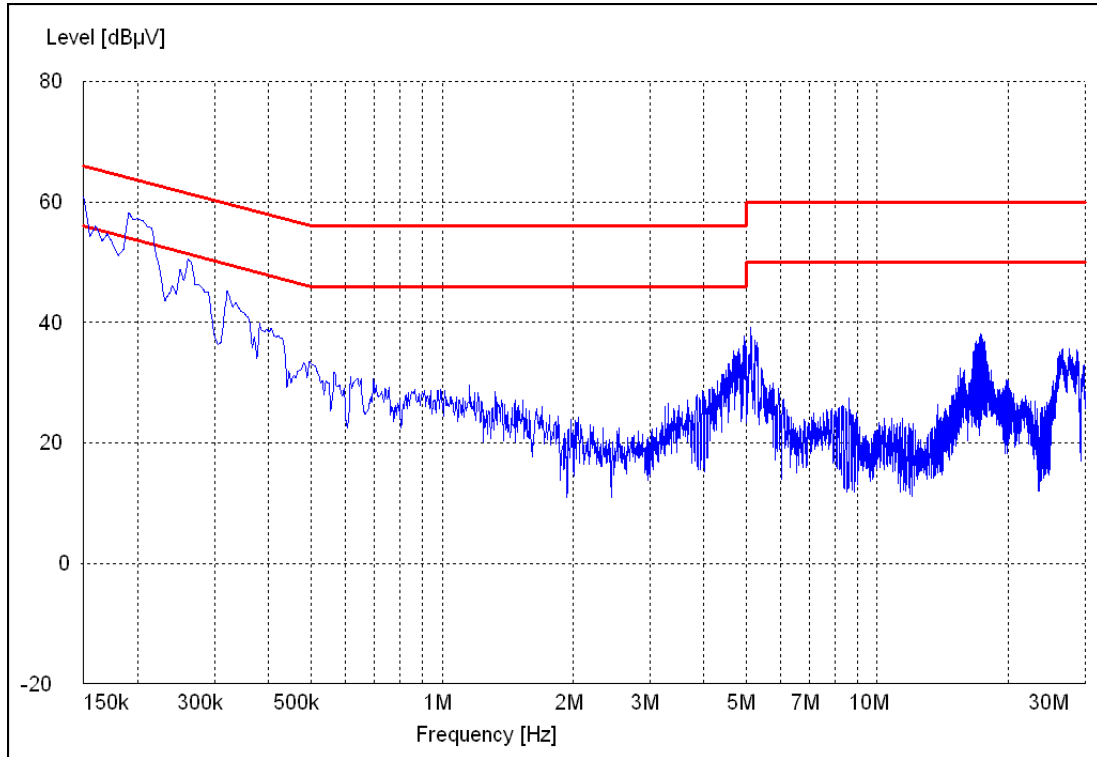
Measured Value at	0.32 MHz	36.7dB $\mu$ V @ Q-Peak mode
+ Correct factor *		9.7 dB
= Conducted Emission		46.4dB $\mu$ V

\* Correct factor is adding RF cable loss and Attenuation

### 3.1.4. Photograph for the test configuration



### 3.1.5. Test Results (Live)



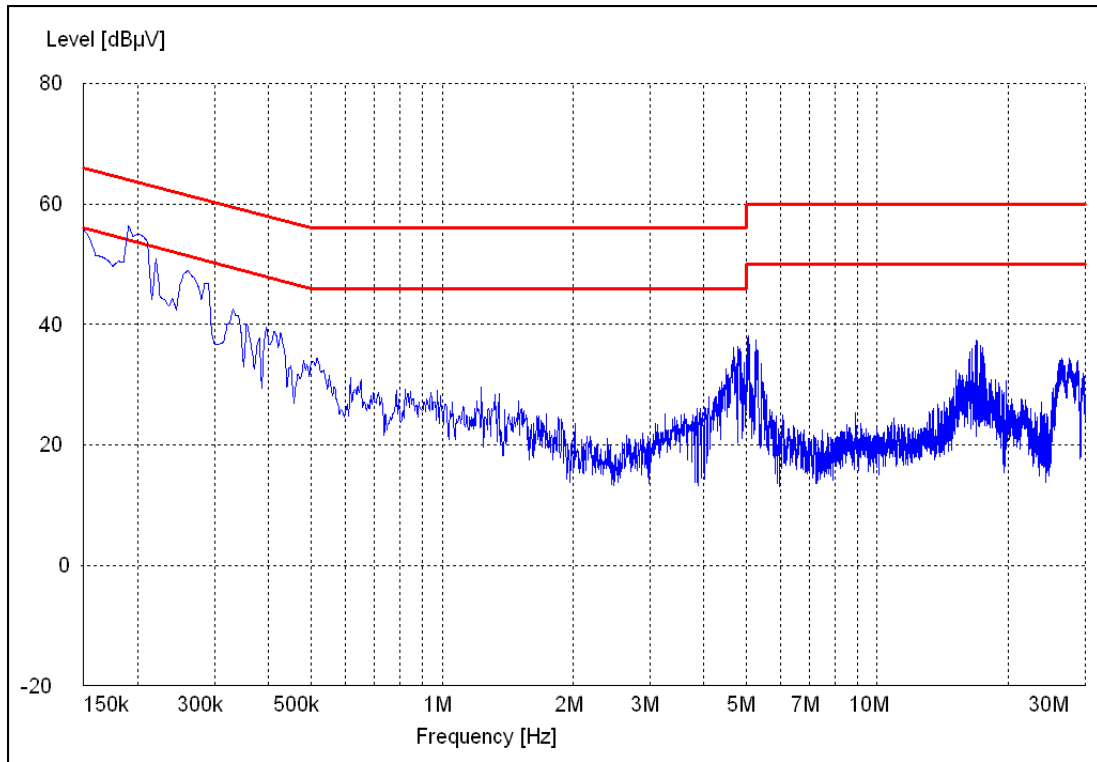
Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Margin (dB)		Limit (dBuV)	
			QuasiPeak	Average	QuasiPeak	Average
0.15	54.50	30.67	11.50	25.33	66.0	56.0
0.19	54.75	33.51	9.25	20.49	64.0	54.0
0.26	45.83	27.41	15.57	23.99	61.4	51.4
5.13	29.56	14.65	26.44	31.35	56.0	46.0
17.29	29.61	19.82	30.39	30.18	60.0	50.0
27.60	31.72	25.85	28.28	24.15	60.0	50.0

**Notes:**

1. All Modes of operation were investigated and the worst-case emissions are reported.
2. Trace shown in plot are made using a peak detector.



### 3.1.6. Test Results (Netural)



Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Margin (dB)		Limit (dBuV)	
			QuasiPeak	Average	QuasiPeak	Average
0.15	52.92	29.73	13.08	26.27	66.0	56.0
0.19	53.76	32.88	10.24	21.12	64.0	54.0
0.26	44.75	26.67	16.65	24.73	61.4	51.4
5.06	30.70	15.47	29.3	34.53	60.0	50.0
16.93	29.98	18.92	30.02	31.08	60.0	50.0
26.53	30.75	24.73	29.25	25.27	60.0	50.0

**Notes:**

1. All Modes of operation were investigated and the worst-case emissions are reported.
2. Trace shown in plot are made using a peak detector.

## 3.2. Radiated Spurious Emissions

### 3.2.1. Test Procedure

#### 3.2.1.1 Preliminary Testing for Reference

Preliminary testing was performed in a KTL absorber-lined room to determine the emission characteristics of the EUT. The EUT was placed on the wooden table which has dimensions of 0.8 meters in height, 1 meter in length and 1.5 meters in width. Receiving antenna (Biconi-Log antenna : 30 to 1000 MHz or Horn Antenna : 1 to 40 GHz) was placed at the distance of 3 meter from the EUT.

An attempt was made to maximize the emission level with the various configurations of the EUT. Emission levels from the EUT with various configurations were examined on a spectrum analyzer connected with a RF amplifier and graphed.

The emission was within the illumination area of the 3 dB beam width of the antenna so that the maximum emission from the EUT is measured.

#### 3.2.1.2 Final Radiated Emission Test at an Absorber-Lined Room

The final measurement of radiated field strength was carried out in a KTL Absorber-Lined Room that was listed up at FCC according to the "Radiated Emissions Testing" procedure specified by ANSI C63.4.

Based on the test results in preliminary test, measurement was made in same test set up and configuration which produced maximum emission level. Receiving antenna was installed at 3-meter distance from the EUT, and was connected to an EMI receiver.

Turntable was rotated through 360 degrees and receiving antenna height was varied from 1 to 4 meters above the ground plane to read maximum emission level. Receiving antenna polarization was changed vertical and horizontal. The worst value was recorded.

If necessary, the radiated emission measurements could be performed at a closer distance than specified distance to ensure higher accuracy and their results were extrapolated to the specified distance using an inverse linear distance extrapolation factor (20 dB/decade) as per Section 15.31(f).

The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

Tested in x, y, z axis and worst case results are reported

The maximum frequency range measuring with the spectrum from 30 MHz to 1 GHz is investigated with the transmitter

### 3.2.2. Limits

- (a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field strength (Microvolts/meters)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

- (b) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the following :

Frequency of Emission (MHz)	Field strength (Microvolts/meters)
30 – 88	90
88 – 216	150
216 – 960	210
Above 960	300

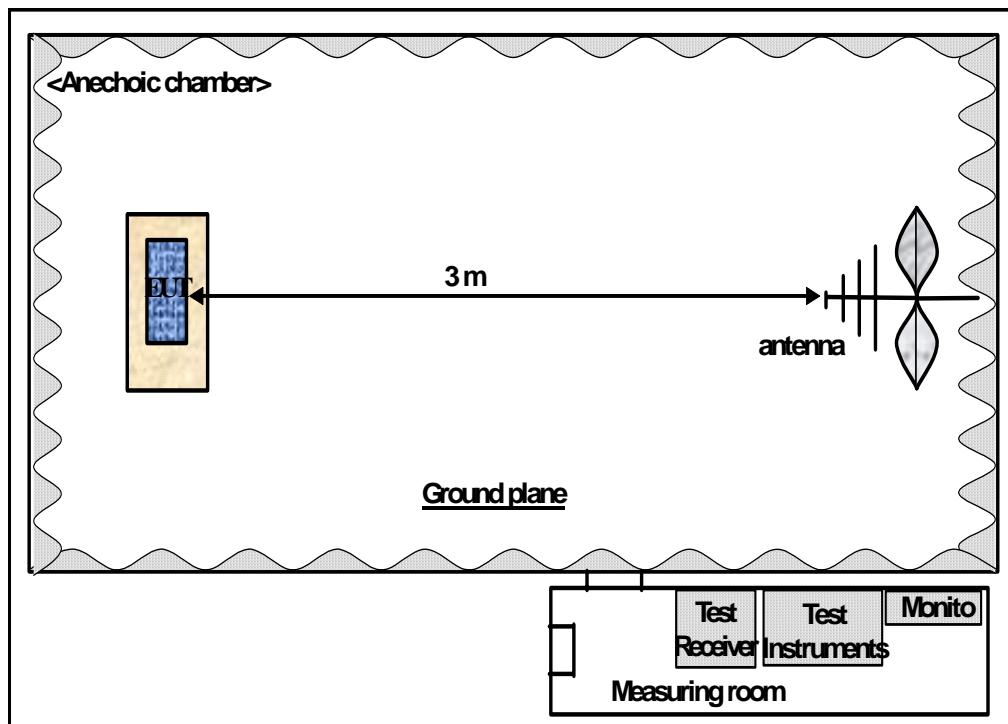
### 3.2.3. Sample Calculation

The emission level measured in decibels above one microvolt ( $\text{dB}\mu\text{V}$ ) was following sample calculation.

For example :

Measured Value at <u>48.2</u> MHz	17.6 $\text{dB}\mu\text{V}$
Antenna Factor & Cable loss	14.3 dB
- Preamplifier	0.0 dB
<hr/>	
= Radiated Emission	31.9 $\text{dB}\mu\text{V}/\text{m}$

### 3.2.4. Photograph for the test configuration



### 3.2.5. Test Results

#### 3.2.5.1 Radiated Emission

Model No. : S20 / SU770

Test distance : 3m

Date : Feb 27, 2009

Frequency MHz	Antenna Pol. H/V	Detector	Reading Level dBμV	Correction (AF+CL+AG) dB/m	Emission Level dBμV/m	Limit dBμV/m	Margin +/-
54.45	V	Q	45.7	-17.5	28.2	40.0	11.8
56.61	V	Q	47.6	-17.7	29.9	40.0	10.1
58.09	V	Q	43.1	-17.9	25.2	40.0	14.8
100.24	H	Q	58.2	-21.4	36.8	43.5	6.7
165.52	V	Q	56.9	-17.5	39.4	43.5	4.1
166.16	V	Q	51.6	-17.5	34.1	43.5	9.4
167.13	V	Q	53.0	-17.5	35.5	43.5	8.0
168.03	V	Q	54.2	-17.6	36.6	43.5	6.9
192.08	V	Q	53.7	-18.9	34.8	43.5	8.7
501.56	V	Q	47.4	-11.0	36.4	46.0	9.6

- Note :**
1. Measurement was done over the frequency range from 30 MHz to 5th harmonic. The EUT was rotated and the antenna was changed to a range of height of from 1 m to 4 m above the ground plane for maximum response.
  2. The observed Spectrum Analyzer (E4448A) noise floor level was 2.0 dBμV. And all other emissions not reported on data were more than 40 dB below the permitted level.
  3. For measurement the video bandwidth is set to 10 Hz for average measurements.

\* D.M. : Detect Mode (P : Peak, Q : Quasi-Peak, A : Average)

Antenna Polarization (H : Horizontal, V : Vertical)

A.F. : Antenna Factor

C.L. : Cable Loss

A.G. : Amplifier Gain

**Remark :** Emission level (dBμV/m) = Reading level (dBμV) + Correction (dB/m) + Amplifier Gain (dB)

Margin (dB) = Limit (dBμV/m) – Emission level (dBμV/m)

The “+” sign of the margin means that emission level are within the limit and the “-” sign means over the limit.

## 4. TEST EQUIPMENTS

No.	Equipment	Manufacturer	Model	S/N	Effective Cal.Duration
1	EMI Receiver (20 Hz ~ 26.5 GHz)	R&S	ESIB	100280	08/17/2008 ~ 08/17/2009
2	Spectrum Analyzer (100 Hz ~ 26.5 GHz)	Agilent	E4407B	US41443316	12/01/2008 ~ 12/01/2009
3	Spectrum Analyzer (3 Hz ~ 50 GHz)	Agilent	E4448A	MY43360322	08/30/2008 ~ 08/30/2009
4	Pre-Amplifier ( 100 kHz ~ 1 GHz)	SONOMA.	310N	186270	08/25/2008 ~ 08/25/2009
5	Pre-Amplifier (0.5 GHz ~ 26.5 GHz)	Agilent	83017A	MY39500982	04/02/2009 ~ 04/02/2010
6	LISN(50 $\Omega$ , 50 $\mu$ H) (10 kHz ~ 100 MHz)	R&S	ESH3-Z5	826789009	07/05/2008 ~ 07/05/2009
7	Biconi-Log Ant. (30 MHz ~ 1000 MHz)	Schwarzbeck	VULB9168	9168-180	08/24/2008 ~ 08/24/2009
8	Horn Ant. (1 GHz ~ 18 GHz)	EMCO	3115	9012-3595	03/26/2009 ~ 03/26/2010
9	Horn Ant. (18 GHz ~ 40 GHz)	EMCO	3116	2664	03/26/2009 ~ 03/26/2010
10	Active Loop Ant. (9 kHz ~ 30 MHz)	EMCO	6502	2532	06/08/2008 ~ 06/08/2009
11	DC Power Supply	Agilent	E4356A	MY41000296	10/01/2008 ~ 10/01/2009

### \* Test Support Equipment

No.	Equipment	Manufacturer	Model	S/N
1	Notebook PC	Samsung	NT-Q45	907Z93FP901125J
2	Notebook AC Adaptor	LISHIN Intentional Electronics CO.,LTD.	AD-6019	CNBA4400238AD2VH7946468
3	USB Mouse	Dong-Kwan Elec	GP-M3000UE	75016144

## Appendix.1 EUT photo

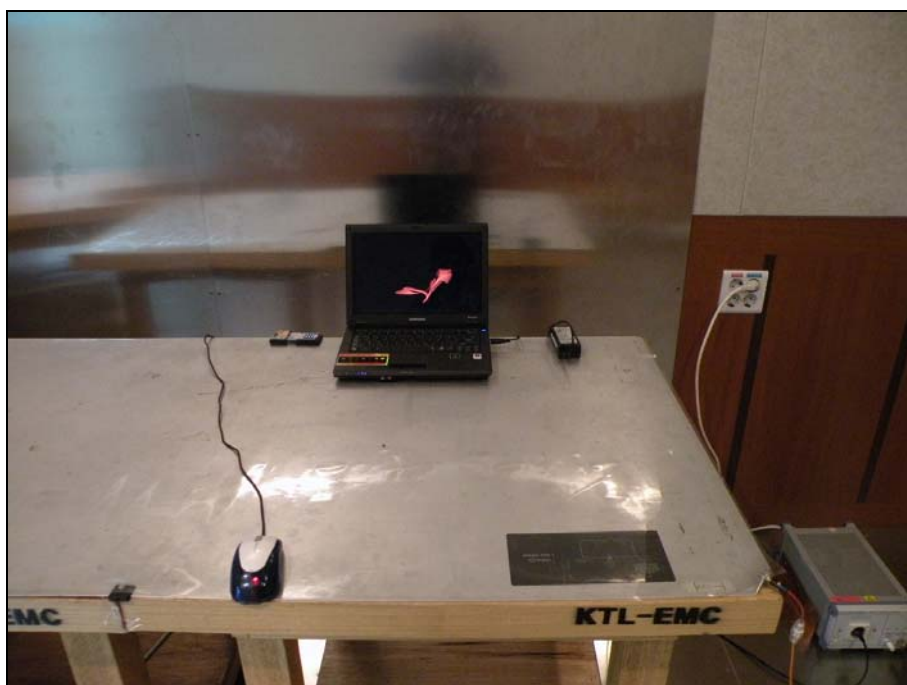




## Appendix.2 Test setup photo



**<Radiated Emission>**



**<AC Conducted Emission>**