



EMISSION TEST REPORT

Test report file No. : **01-IST-037/FB** Date of issue : Apr. 20, 2001.

Model / Type No. : IV011A

Kind of product : VGA Card

Applicant : Inside Telnetcom Co., Ltd.

Manufacturer : Inside Telnetcom Co., Ltd.

Address : Rm.608 Kum-Gang Venturetel Bldg,#1108,Bi-San Dong,
Dong-An Gu, An-Yang City, Kyung-Gi Do, KOREA

Test result according to the regulation(s)

☒ Positive ☐ Negative

at page 3.

This test report without appendix consists of 13 pages.

It is not allowed to copy this report even partly without the allowance of the Test Laboratory.

This equipment is complied with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992.

DIRECTORY

A) Documentation.

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B) Test Data.

Conducted emissions (Mains)	: 450 kHz - 30 MHz	<u>9 ~ 11</u>
Radiated emissions	: 30 MHz – 1 GHz	<u>12</u>

C) Appendix

TEST REGULATIONS

The tests were performed according to the following regulations ;

- - FCC Part 15, Subpart B (Unintentional Radiators, Class B)

INFORMATION OF TEST LABORATORY

IST EMC Lab.

San 21-8 Goan-Ri, Baekam-Myun, Yongin-Si, Kyunggi-Do, Korea

International - Tel : 82-31 - 333 - 4093. Fax : 82-31 - 333 - 4094.

Domestic - Tel : 031 - 333 - 4093. Fax : 031 - 333 - 4094.

ENVIRONMENTAL CONDITIONS

Temperature	<u>24</u>
Humidity	<u>43</u> %
Atmospheric pressure	<u>998</u> mbar

TEST CONDITIONS

The **measurement of the conducted emissions (Interference voltage)** was performed in a shielded room.

Test location :

- - Shielded room. No.1 □ - Compact chamber 2

Used testing instruments :

<u>Name</u>	<u>Type</u>	<u>Manufacturer</u>	<u>Calibration. Date</u>	<u>Serial Number</u>
■ ESH 3	Test Receiver	Rohde & Schwarz	Oct. 08, 2000	861742/018
■ 3725/2	LISN	EMCO	Oct. 08, 2000	9102-1788
■ 3825/2	LISN	EMCO	Dec. 20, 2000	9103-1788
■ ESH 3-Z2	Pulse Limiter	Rohde & Schwarz	Mar. 30, 2001	357.8810.52

Test - accessories :

<u>Type</u>	<u>Manufacturer</u>
■ Aneroid Barometer	Sato
■ Hygrometer	Sato

Measurement Procedures :

Conducted emissions measurements were made in accordance with ANSI C-63.4-1992, "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50Ω/ 50uH LISN as the input transducer to an EMI/Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an IF bandwidth of 10kHz or for "quasi-peak" within a bandwidth of 9kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :



B. K. Bae. / Research Engineer
IST EMC Lab.

The **measurement of the radiated emissions (Electric field)** in the frequency range from 30 MHz to 1GHz was performed in horizontal and vertical antenna polarization at a open-site which meet the site attenuation requirement of ANSI C63.4-1992 and a test distance of :

- - Open-site 1
- - 3 meters.
- - Compact chamber
- - 10 meters

Used testing instruments :

<u>Name</u>	<u>Type</u>	<u>Manufacturer</u>	<u>Calibration. Date</u>	<u>Serial Number</u>
■ ESVP	Test Receiver	Rohde & Schwarz	July. 21, 2000	861744/004
■ VULB 9160	Antenna	Schwarzbeck	July. 11, 2000	3048

Test - accessories :

Type	Manufacturer
■ Aneroid Barometer	Sato
■ Hygrometer	Sato

Measurement procedures

Radiated measurements were in accordance with ANSI C63.4-1992 "Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurements were performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a EMI/Field Intensity Meter. The measurements were made with the detector set for "quasi-peak" within a bandwidth of 120kHz.

All used test-instruments as well as the test-accessories are calibrated regularly.

Test engineer :



B. K. Bae. / Research Engineer
IST EMC Lab.

EQUIPMENT UNDER TEST

Equipment Description

The Equipment Under Test (EUT) is the **VGA Card of Inside Telnetcom Co., Ltd.**

Product Type	- Type: VGA Card (3D)
	- CPU : GeForce2 MX(nVIDIA)
Video	- Input Signal: Analog R,G,B & Digital Mode
	- TwinView, DVC(Digital Vibrance Control)
	- TV Out : Composite, S-VHS (Option)
Resolution &	- 1600*1200
Scan Frequency	- Vertical: 85Hz
Power rating	- DC 2.0V, 5V, 3.3V,12V,1.6V
Dimension	- <u>159.87(W) x 96.97(H) x 1.6(D) : (mm)</u>
Internal frequencies	- Crystal Clock-14.31818MHz

Operation - mode of the E.U.T. :

The equipment under test was operated during the measurement under following conditions :

- ☐ Standby.
- ☒ Test program (H – Pattern) : Scrolling “H” characters under MS Windows98
- ☐ Test program (customer specific)

Configuration of the equipment under test :

Following peripheral devices and interface cables were connected during the measurement :

Equipment	Type	Brand	Serial No	FCC ID
PC	CT6470	Daewoo	9012N00451	N/A
Keyboard	SKM-1080	Se-jin Electron INC	N/A	N/A
Printer	A0302384	Northern Telecom	26633S60168	BS16XU2225C-L
Mouse1	M-S34-6MD	Logitech	LZB63200035	DZL210472
Mouse2	M-M28	Logitech	LCA53305547	DZL210365
Joystick	X03-5740	Microsoft	85791-579- 8892384-00000	N/A
Head-Set	NM-V33	TOCO	N/A	N/A

- Unshielded AC power cable : 1.8m
- Shielded monitor's signal cables(Analog) : 1.5m
- Shielded DVI signal cables : 2.8m
- Unshielded S-VHS cables : 1.6m
- Unshielded USB cables : 1.6m

TEST RESULT

Conducted emissions : 450 kHz - 30 MHz

The requirements are.

■ KEPT

NOT KEPT

Min. limit margin

3.4 dB at 0.4726 MHz

Remarks : See test-graph to be attached at pages 9~11.

Radiated emissions (magnetic field) : 10 kHz - 30 MHz

The requirements are

KEPT

NOT KEPT

Max. limit margin.

_____ dB at _____ MHz

Remarks :

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are

■ KEPT

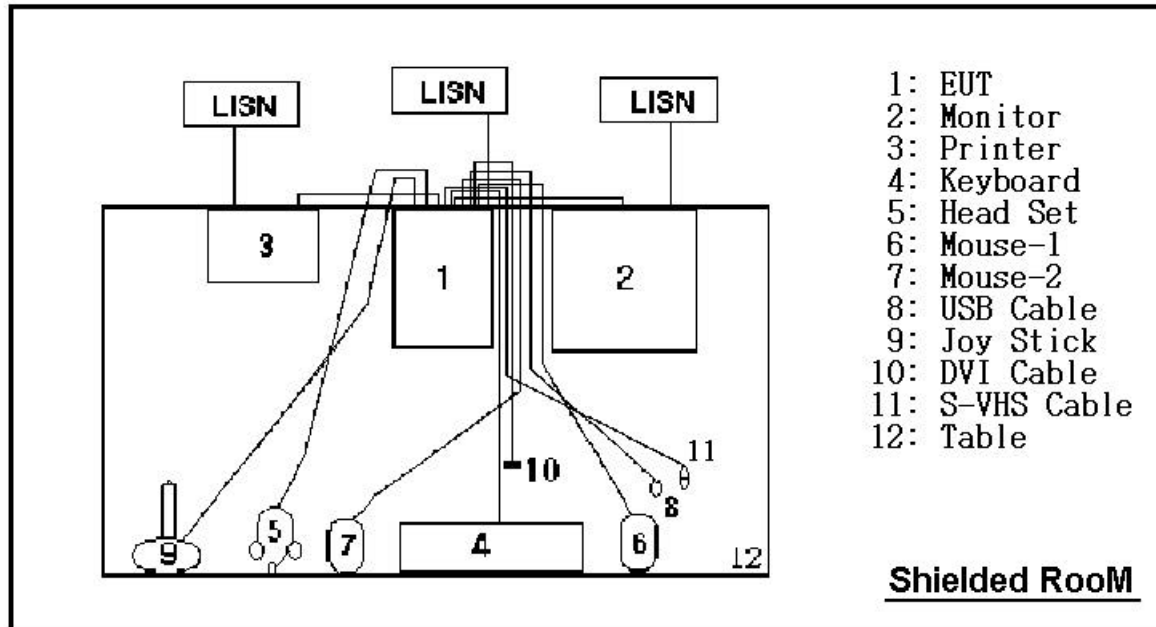
NOT KEPT

Min. limit margin

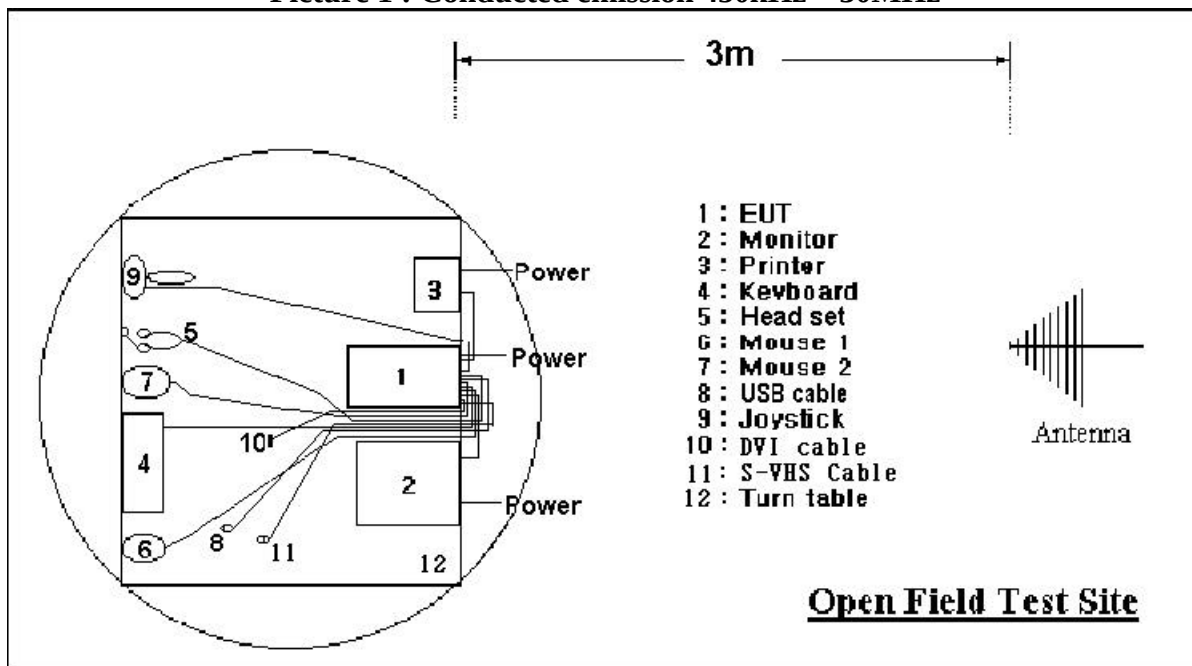
12.0 dB at 144.4 MHz

Remarks : See test-data at page 12.

**Test Set-Up
(Type : IV011A)**



Picture 1 : Conducted emission 450kHz ~ 30MHz



Picture 2 : Radiated emission 30MHz ~ 1000MHz

Conducted Emission Test Data

Type : IV011A
 Manufacturer : Inside Telnetcom Co., Ltd.
 Operation mode : Scrolling "H" pattern display 1600 X 1200, 85Hz
 Date : Apr. 02, 2001

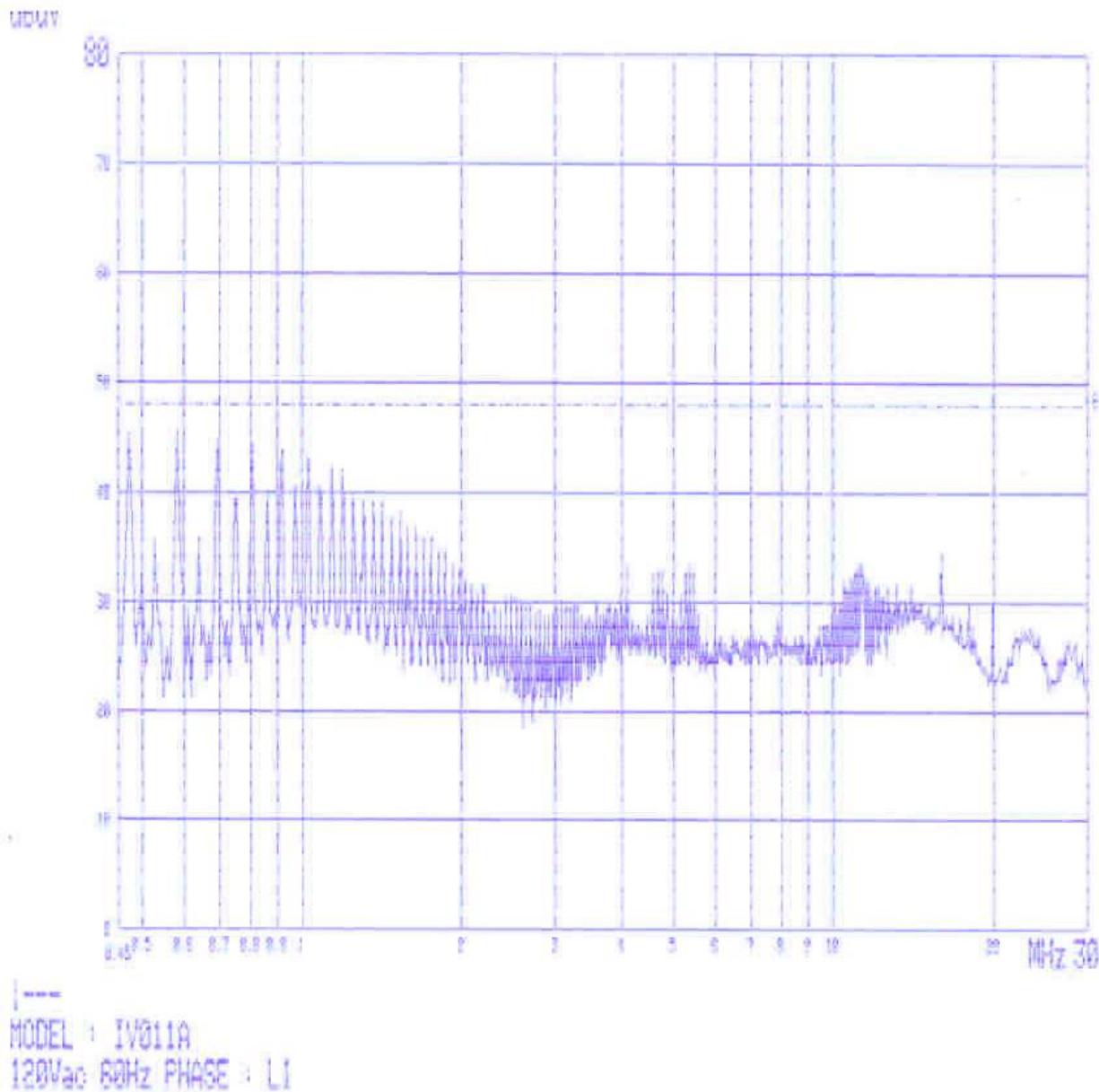
Highest Emissions relative to the limit

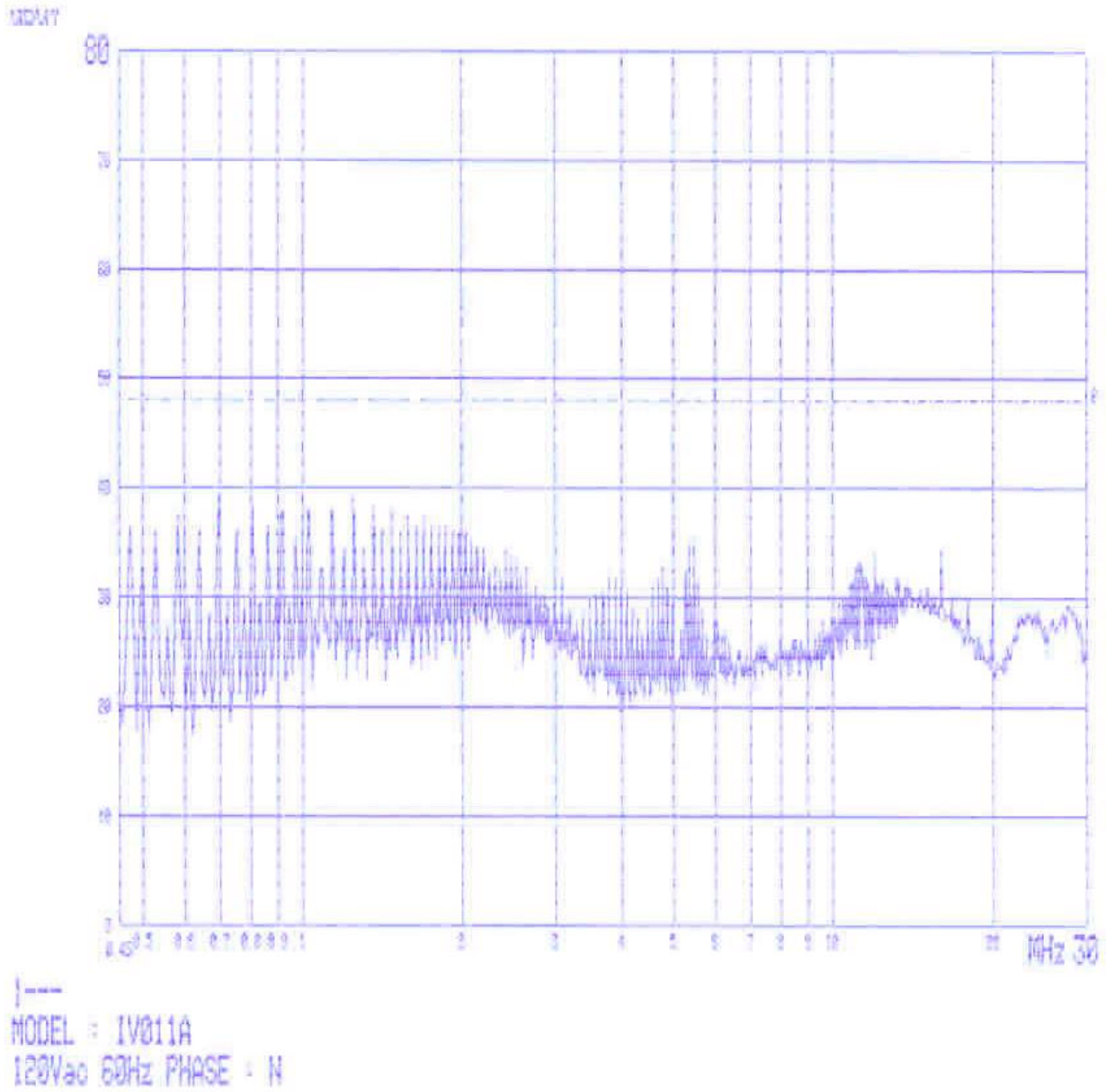
Frequenc y [MHz]	Reading [dBμV]	Insertion loss [dB]	Phase (*L1/**N)	Limit [dBμV]	Margin [dB]
0.4726	44.6	0.8	L1	48.0	3.4
0.5846	44.3	0.8		48.0	3.7
0.6954	36.4	0.8		48.0	11.6
0.6957	43.8	0.8		48.0	4.2
0.8100	36.6	0.8		48.0	11.4
1.2511	36.5	0.8		48.0	11.5
0.4726	44.0	0.8	N	48.0	4.0
0.5846	44.5	0.8		48.0	3.5
0.6955	37.6	0.8		48.0	10.4
0.6958	44.0	0.8		48.0	4.0
0.8058	37.0	0.8		48.0	11.0
1.2514	37.1	0.8		48.0	10.9
Cable loss are less than 0.1 dB					

*L1 : Live Line

**N : Neutral Line

*** Please refer to data graphs at page 10 ~ 11





Radiation Test Data

Type : IV011A
 Manufacturer : Inside Telnetcom Co., Ltd.
 Operation mode : Scrolling "H" pattern display 1600 X 1200, 85Hz
 Test distance : 3 m
 Antenna : VULB9160
 Date : Apr. 04, 2001.

Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Height [cm]	Polar [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
100.0	15.4	8.4	1.8	112	110	V	25.6	43.5	17.9
120.2	16.6	9.9	2.0	123	108	V	28.5	43.5	15.0
144.4	17.5	11.8	2.2	23	125	V	31.5	43.5	12.0
174.4	15.0	11.5	2.4	175	142	V	28.9	43.5	14.6
177.0	13.5	11.2	2.4	183	485	H	27.1	43.5	16.4
231.0	11.7	9.6	2.8	184	387	H	24.1	46.0	21.9
233.6	9.0	9.8	2.8	177	384	H	21.6	46.0	24.4
243.0	10.8	10.4	2.9	15	372	H	24.1	46.0	21.9
264.1	16.0	11.4	2.9	165	125	V	30.3	46.0	15.7
299.5	10.0	11.8	3.2	176	133	V	24.9	46.0	21.1

SUMMARY

GENERAL REMARKS :

The equipment is not modified anything, mechanical or circuit to improve EMI status during a measurement and complied the regulation "Part 15 subpart B Class B of CFR 47"

FINAL JUDGMENT :

The requirements according to the technical regulations are

- ☒ Kept ☐ Not kept

The equipment under test does

- ☒ - Fulfill the general approval requirements mentioned on page 3.
☐ - Not fulfill the general approval requirements mentioned on page 3.

Begin of testing : Mar. 28, 2001

End of testing : Apr. 09, 2001

Reviewed by :



Joon H. Lee, EMC Manager
IST EMC Lab.

Approved by :



G. Chung Chief of EMC Lab.