



ESTECH Co., Ltd.
3rd Fl., Chungdam Bldg.,
119-1 Chungdam-dong,
Kangnamgu, Seoul



**Electromagnetic
Interference
Test Report**

Compliance Test Report for FCC

Report Number	ESTF150202-001			
Applicant	Company Name	Elesign INC.		
	Address	403, KOLON techno valley, 60-4, Kasan-dong, Kumcheon gu, Seoul, Korea		
	Telephone	82-2-866-6190		
Product	Product Name	Residential Gateway		
	Model No.	ESC 1702	Manufacturer	Elesign INC.
	Serial No.	-	Country of origin	Korea
Test data	Date of Receipt	2002.1.30	Date of Issue	2002.2.14
Testing Location	ESTECH. Co., Ltd 97-1, Hoi-uk Ri Ma-jang Myon, Icheon city, Kyung-Ki Do, Korea			
Standard	FCC PART 15 2001, ANSI C 63.4 2001			
Emission Test	<input checked="" type="checkbox"/> Conducted Emission		<input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B	Test Result : OK
	<input checked="" type="checkbox"/> Radiated Emission		<input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B	Test Result : OK
Measurement Facility Registration Number : 94696				
Tested by : Senior Engineer J. M. Yang (Signature/Seal)				
Reviewed by : Director T. K. Lee (Signature/Seal)				
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable			
<p>* Note</p> <ul style="list-style-type: none"> - This test report is not permitted to copy partly without our permission - This test result is dependent on only equipment to be used - This test result based on a single evaluation of one sample of the above mentioned 				



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1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and tested in accordance with the measurement procedures as indicated in this report ESTECH Lab. attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.

ESTECH Lab. assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co. Ltd.

Head Office : 3 rd Fl., Chungdam Bldg., 119-1, Chungdam-dong Kangnam-gu , Seoul, Korea
(Safety & Telecom. Test Lab)

EMC Test Lab. : 58-1, O-San Ri, Ga-Nam Myon, Yeo-Joo Gun, Kyung-Ki Do, Korea
97-1, Hoi-uk Ri Ma-jang Myon, Icheon city, Kyung-Ki Do, Korea

Branch Office : USA-ESTECH INC.
21801 Stevens Creek Blvd. Suite 2A Cupertino, CA95014

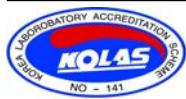
1.3 Official Qualification(s)

MIC : Granted Accreditation from Ministry of Information & Communication for EMC,
Safety and Telecom.

KOLAS : Accredited Lab. By Korea Laboratory Accreditation Schema base on CENELEC
requirements

FCC : Filed Laboratory at Federal Communications Commission

VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE





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2. Description of EUT

2.1 Summary of Equipment Under Test

◆ EUT Name : **Residential Gateway**

◆ Model Number : **ESC 1702**

◆ Serial Number : -

◆ Manufacturer : **Elesign INC.**

◆ Country of origin : **KOREA**

◆ Power Rating

Adaptor Using. **Input : AC 90~260V , 60 Hz**

Output : DC 5V/1.0A

◆ Test Date

Test Date : **2002. 2. 4**

2.2 General descriptions of EUT

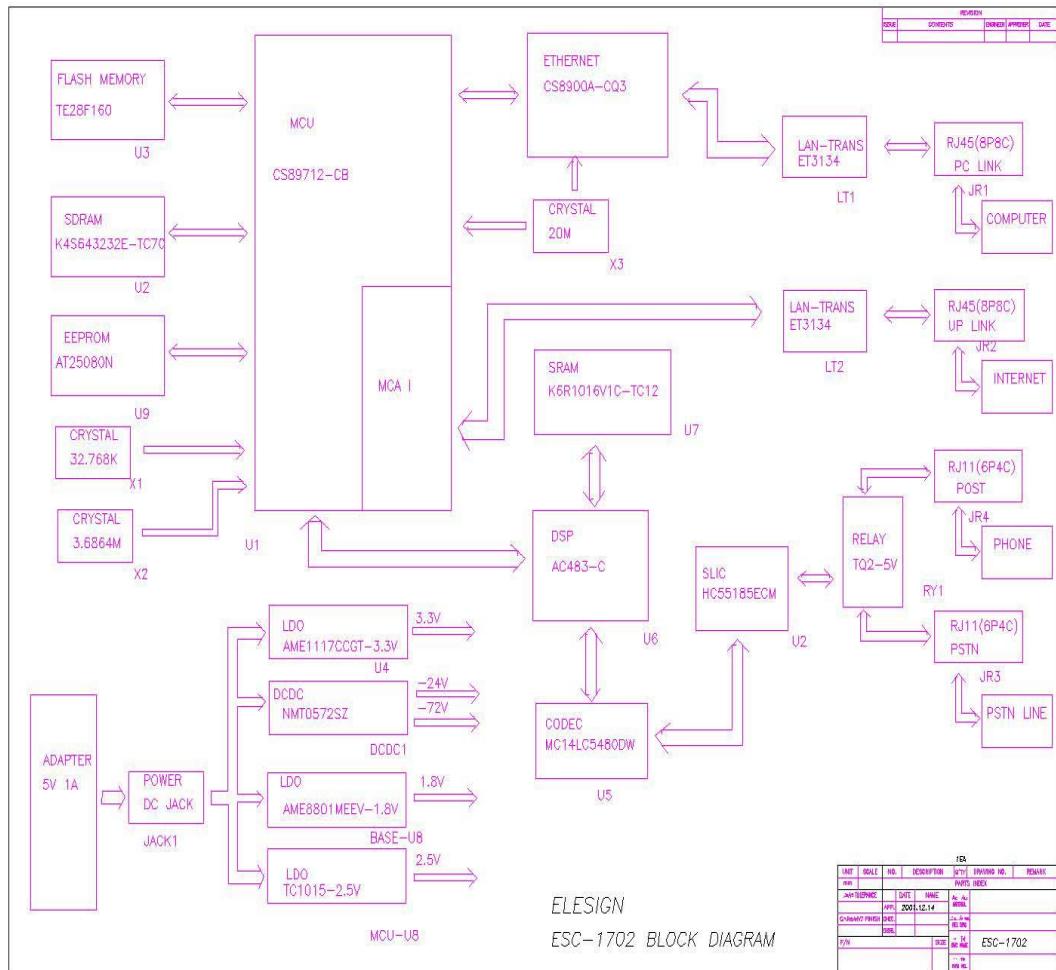
- ESC 1702 is a 1-port gateway, which enables Internet phone call thru existing conventional phone. It's a stand-alone device, which means no PC connection is necessary to use ESC 1702 except for the initial configuration thru built-in web-server.



2.3 Circuit Diagram

Attached file : 12 file

2.4 EUT Block Diagram



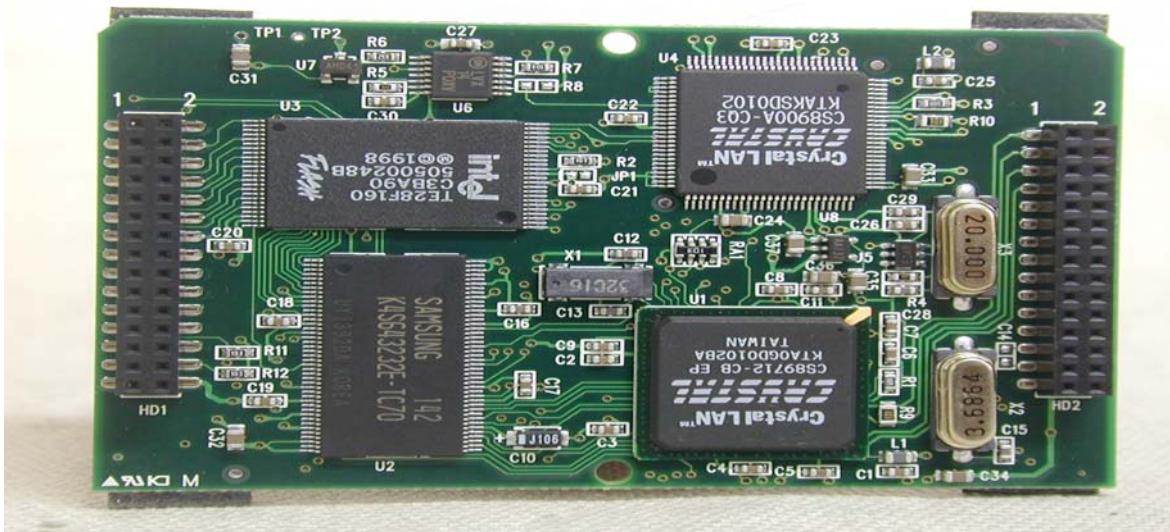
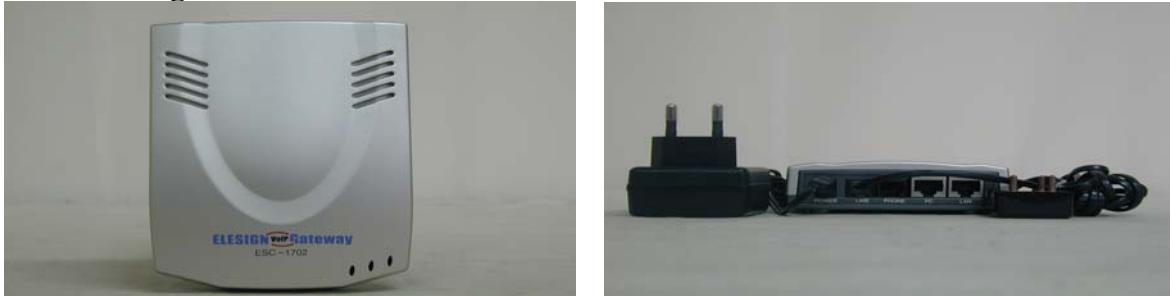


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2.5 EUT Figure





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3. Test Standards

Test Standard : FCC PART 15 (2001)

This Part sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (2001)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements.

These methods cover measurement of certain devices that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment.

These methods apply to the measurement of individual units or systems comprised of multiple units.





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4. Measurement Condition

4.1 EUT Operation.

- The EUT was in the following operation mode during all testing
- The EUT is connected with PC and Phone. And check to normal mode operation
- The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected highest level of emission.

4.2 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
Residential Gateway	10 Base-TX	PC	10/100Base TX	2.0	Un-shielded	-
Residential Gateway	LAN	Exteriors Network	10/100Base TX	25.0	Un-shielded	-
Residential Gateway	Tel-Line	OutLine	-	25.0	Un-shielded	-
Residential Gateway	Phone	Phone	-	2.0	Un-shielded	-
Residential Gateway	Power	Adapter	-	2.0	Un-shielded	-
PC	Video	Monitor	Video	2.0	Shielded	
PC	PS/2 Keyboard	Keyboard	PS/2 Keyboard	2.0	Un-shielded	
PC	PS/2 Mouse	Mouse	PS/2 Mouse	2.0	Un-shielded	-

4.3 EUT Configurations

Equipment Name	Model Name	S/N	Manufacturer/ Country of origin	Remark (FCC ID)
Residential Gateway	ESC 1702	-	Elesign, Inc./Korea	EUT
PC	M6030	ERA00236	Samsung Electronic/Korea	-
Monitor	D8897	CN11104168	HP/China	ARSCM350S
Keyboard	7800	K19120116	BTC Telecom. Co., Ltd/Korea	-
Mouse	M-S48a	HCA11804896	Logitech/China	JNZ201213
Adapter	SRXD51059P@02	NONE	Seorim Electronic/Korea	-
Phone	SP-F214	KKAN5292727	Samsung Electronic/Korea	-





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5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with **FCC Part 15 (2001) & ANSI C 63.4 (2001)**. The test setup was made according to **FCC Part 15 (2001) & ANSI C 63.4 (2001)** on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test set-up.

5.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Receiver	ESPC	Rohde & Schwarz	838248/001	2003. 1. 31
LogBicon Antenna	VULB 9160	S/B	3107	2002.5.9
Turn Table	2087	EMCO	2129	-
Antenna Mast	2070-1	EMCO	9702-203	-
Amplifier	310N	Sonoma Instrument	185817	2002.9.27
ANT Mast Controller	2090	EMCO	1535	-
Turn Table Controller	2090	EMCO	1535	-

5.2 Environmental Conditions

Section	Temperature (°C)	Humidity (%)	Pressure (hPa)
Radiated	8	65	-
Test Place	Open site : 3m		





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5.3 Test data sheet

Frequency (MHz)	Position (V/H)	Height (m)	Correction Factor (dB)		Result Value (dBuV/m)		Margin
			Air Line	Cable etc.	Limit	Result	
157.73	V	1.0	13.15	2.60	43.50	33.75	-9.75
165.91	V	1.0	12.82	2.72	43.50	37.04	-6.46
170.01	V	1.0	12.60	2.80	43.50	38.40	-5.10
174.11	V	1.0	12.23	2.84	43.50	38.08	-5.42
178.20	V	1.0	11.87	2.88	43.50	37.25	-6.25
194.58	H	1.7	10.15	2.95	43.50	38.61	-4.89
210.96	H	1.5	10.06	3.20	43.50	37.26	-6.24
251.94	H	1.1	11.66	3.52	46.00	39.18	-6.82
260.12	H	1.2	11.87	3.60	46.00	39.98	-6.02
264.22	H	1.2	12.03	3.64	46.00	39.67	-6.33
294.95	V	1.0	12.96	3.80	46.00	40.26	-5.74
811.10	H	1.0	22.32	6.92	46.00	37.75	-8.25
Remark	H : Horizontal, V : Vertical						





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6. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.45 to 30 MHz was measured in accordance to **FCC Part 15 (2001) & ANSI C 63.4 (2001)**. The test setup was made according to **FCC Part 15 (2001) & ANSI C 63.4 (2001)** in a shielded. The EUT was placed on a non-conductive table at least 80 above the ground plan. A grounded vertical reference plane was positioned in a distance of 40cm from the EUT. The distance from the EUT to other metal surfaces was at least 0.8m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0m.. The test receiver with Quasi Peak detector complies with CISPR 16.

6.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESHS-Z5	Rohde & Schwarz	838979/010	2003. 2. 1
LISN	NNLA81020A	Schwarzbeck	8120161	2003. 2. 1
TEST Receive	ESPC	Rohde & Schwarz	838248/001	2003. 1. 31

6.2 Environmental Conditions

Section	Temperature (°C)	Humidity (%)	Pressure (hPa)
Conducted	20	45	-
Test Place	Shield Room		





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6.3 Test data sheet

Frequency (MHz)	Correction Factor (dB)		Quasi-peak Value (dBuV/m)			Margin
	Lisn	Cable etc.	Limit	Result	Line	
0.46	0.07	0.2	48.00	35.79	N	-12.21
0.99	0.09	0.2	48.00	38.20	N	-9.80
1.06	0.09	0.2	48.00	39.41	N	-8.59
1.13	0.09	0.2	48.00	37.94	N	-10.06
1.19	0.09	0.2	48.00	39.26	N	-8.74
1.32	0.10	0.2	48.00	37.42	N	-10.58
1.98	0.11	0.3	48.00	40.69	N	-7.31
2.05	0.11	0.3	48.00	40.16	N	-7.84
2.58	0.13	0.3	48.00	39.16	N	-8.84
2.64	0.13	0.3	48.00	40.50	N	-7.50
3.30	0.15	0.3	48.00	39.85	N	-8.15
3.43	0.15	0.3	48.00	40.65	N	-7.35
Rema2.16rk	H : Hot Line, N : Neutral Line					





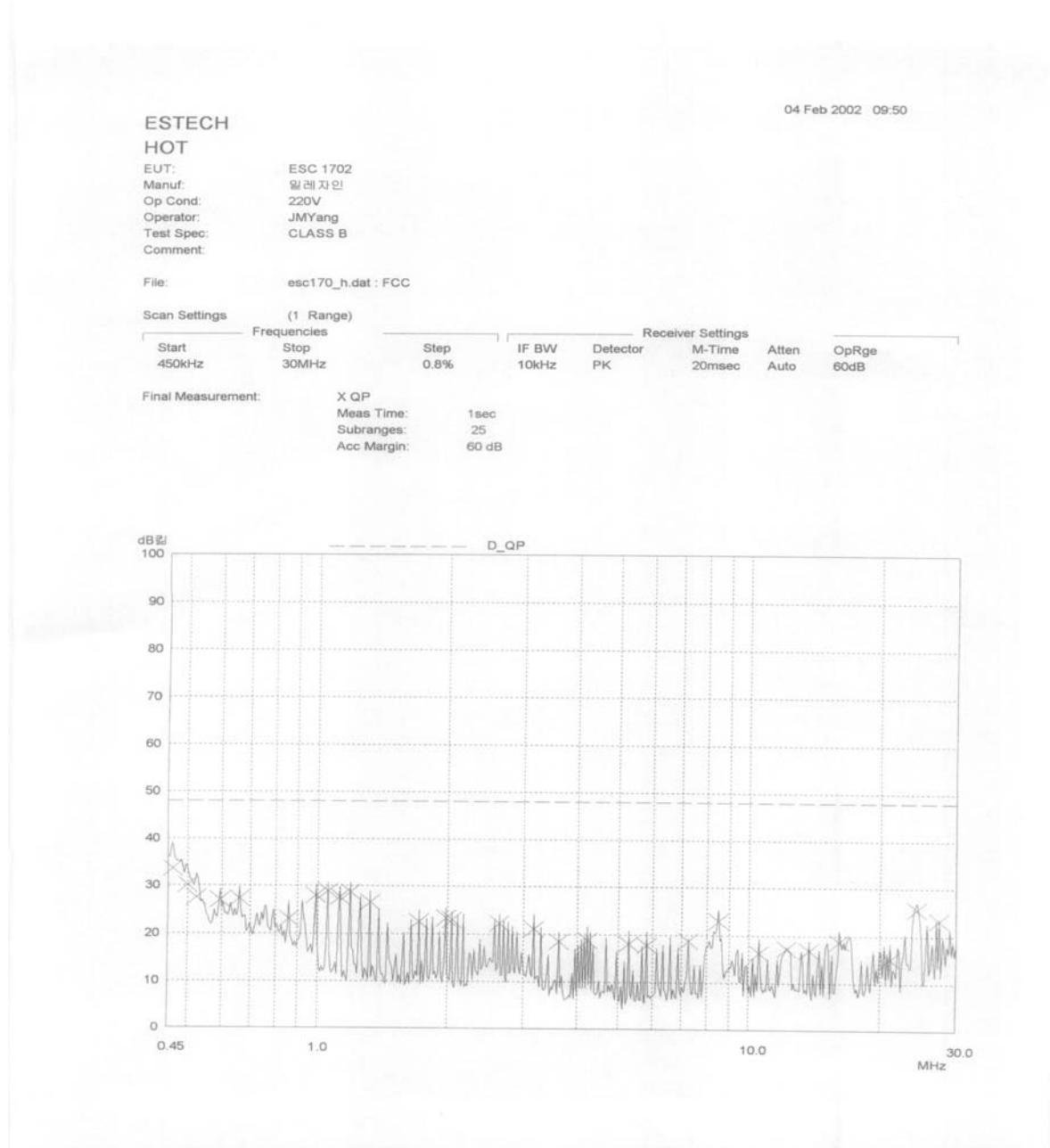
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6.4 Spectral Diagram

- Hot Line





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- Neutral Line

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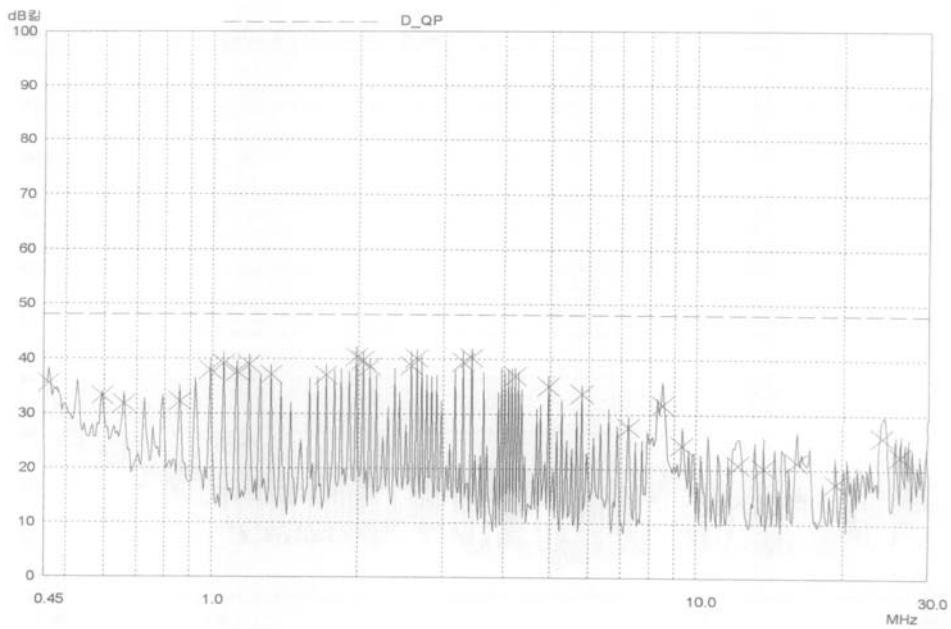
04 Feb 2002 09:57

EUT: ESC 1702
Manuf: 일렉자인
Op Cond: 220V
Operator: JMYang
Test Spec: CLASS B
Comment:

File: esc170_n.dat : FCC

Scan Settings (1 Range)			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	OpRge	
450kHz	30MHz	0.8%	10kHz	PK	20msec	Auto	60dB	

Final Measurement: X_QP
Meas Time: 1sec
Subranges: 25
Acc Margin: 60 dB





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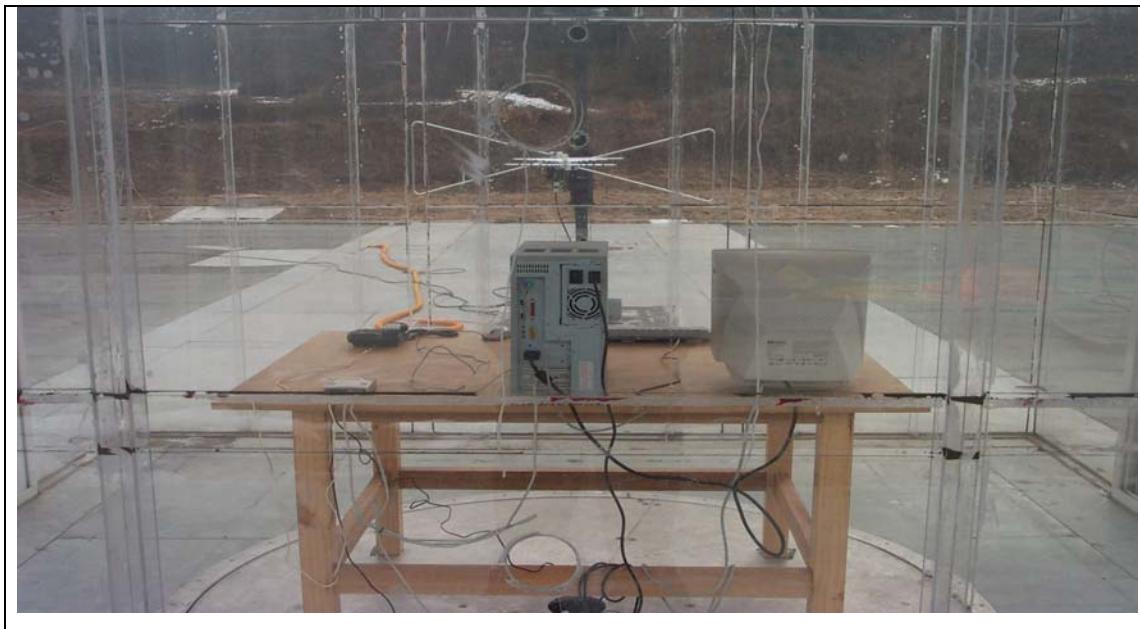
7 Test Setup Photographs

7.1 Setup for Radiated Test : 30 ~ 1000 MHz

[Front]



[Rear]



7.2 Setup for Conducted Test : 0.45 ~ 30 MHz



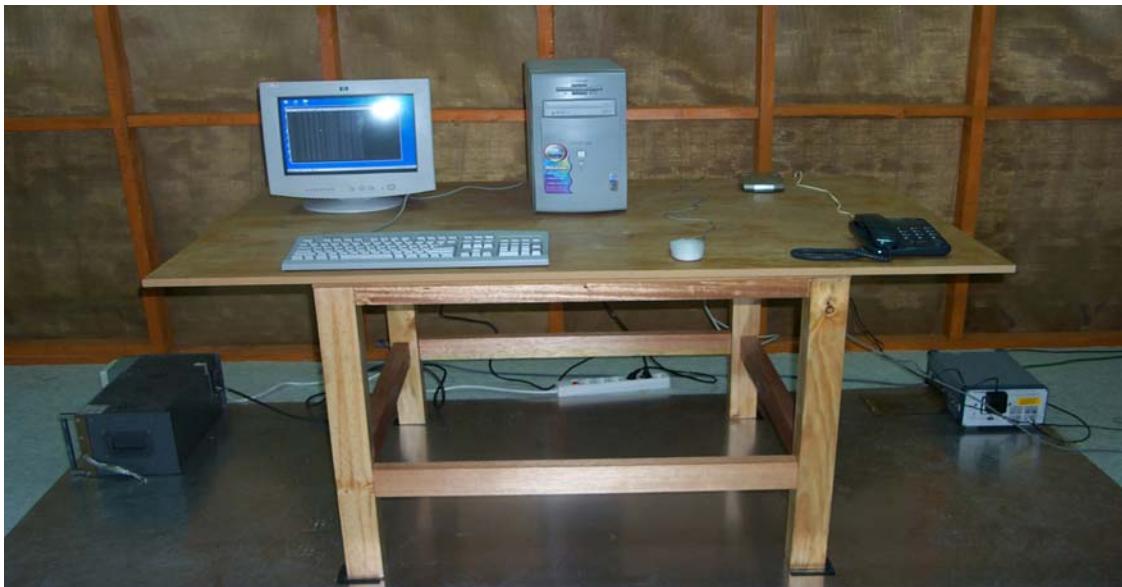


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[Front]



[Rear]

