EMC Test Report

According to FCC Part 15 Subpart B

Project No.	LBE052276
Equipment under Test	
Applicant	Samsung Electronics Co., Ltd
	416 Maetan 3-dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
FCC ID	**A3LGH30CPN**
Product Name	Laser Printer
Model Name	GH30CPN
Manufacturer	Samsung Electronics Co. Ltd
	259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, 730-030, KOREA
Date of Test	Oct 05, 2005 ~ Oct 12, 2005
Issued Date	Oct 18, 2005

	Name/Position	Signature
Tested by	Young Hun. Cheong Test Engineer	
Reviewed by	No Cheon, Park Manager of EMC Lab.	
Authorized by	Seung Kyu, Cha Chief of EMC Lab.	

1. This test reports does not constitute an endorsement by NIST/NVLAP or U.S Government.
2. This test report is to certify that the tested device properly complies with the requirements of FCC Rules and Regulations Part 15 Subpart B Unintentional Radiators.
   All tests necessary to show compliance to the requirements were and these results met the specifications requirement.

This laboratory is registered by the NIST/NVLAP, U.S.A.
The test reported herein have been performed in accordance with its terms of registration.

NVLAP LAB CODE 200623-0

3. FCC filing Registration Number : 873282

Table of Contents

1. General Information

1.1 Basic Information related Product

Applicant	Samsung Electronics Co., Ltd
Model name	GH30CPN
Applicant Address	416 Maetan3- Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 443-742, Korea
Contact Person	Young Hun. Cheong
Kind of product	Laser Printer
Valiant list	GH30CPN, CLP-300N (with network) GH30CPB, CLP-300 (without network)
Manufacturer	Samsung Electronics Co., Ltd. 259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, 730-030, KOREA Place:M259
New / Alternative / Permissive change Information	New

1.2 Detail Information related Product

Specification

Item	Specification and Description
Print Speed	Black and White : Up to 16 PPM in A4(17 PPM in Letter) Color : Up to 4 PPM in A4
Resolution	Up to 2400 x 600 dpi effective output
First print out time	From Ready Black and White : Less than 14 seconds Color : Less than 26 seconds From ColdBoot Black and White : Less than 45 seconds Color : Less than 57 seconds
Warm-up time	Less than 35 seconds

Power Rating	110 ~ 127 VAC, 5A, 50/60 Hz
Power Consumption	Average : 350 W Power Save mode : Less than 17 W
Noise Level	Printing mode Black and white : Less than 48 dBA Color : Less than 48 dBA Standby mode : Less than 35 dBA
Consumable life	Black Toner Cartridge : Approx. 2,000 A4/Letter pages at 5% Coverage Yellow/Magenta/Cyan Toner Cartridge : Approx. 1,000 A4/Letter pages at 5% Coverage
Duty cycle	Monthly : Up to 24,200 images
Weight	13.6 kg (including consumables)
Package weight	Paper : 2 Kg, Plastic : 900 g
External dimensions (W x D x H)	390 x 344 x 265 mm(15.4 x 13.6 x 10.4 in)
Operating Environment	Temperature : 50 ~ 90 °F (10 ~ 32.5℃) Humidity : 20 ~ 80 % RH
Printer Language	SPL-C
Memory	CLP-300 : 32MB CLP-300N : 64MB
Interface	CLP-300 : USB 2.0 CLP-300N : USB 2.0, Ethernet 10/100 Base TX
OS compatibility	Windows 98/Me/NT/2000/XP/2003 Various Linux OS Mac OS 10.3 ~ 10.4

	Windows NT 4.0 is only supported on the CLP-300N

Operating Frequency

Video(15.922 MHz), SDRAM(100 MHz), USB (12 MHz), CPU (300MHz), Network (25MHz)

1.3 Operating Mode and Condition

The system was configured for testing in typical fashion use. Cables were attached to each of the available I/O Ports. Where applicable, peripherals were attached to the I/O cables. The mode of operation utilized for testing was selected to best simulate typical EUT use. The EUT is supporting the USB and LAN printing mode.
In each test mode, finally we found worst case emission that is above configuration with the worst case components(in the above table). So, the data of the maximum EUT operation, USB printing was reported.

- USB Printing Mode (worst emission)
- LAN Printing Mode
- Standby Mode

- Power Input
Voltage : AC 110V
Frequency : 60Hz

1.4 Test System Details

Refer to 1.2

1.5 Equipment Modifications

No equipment modifications were required.

1.6 Test Procedure

1.6.1 Disturbance Voltage at Mains

EUT was placed on a platform nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The rear of tabletop was located 40 cm to the vertical conducting ground plane.

The rear of EUT, including peripherals was aligned and flush with rear of tabletop.

All other surfaces of tabletop was at least 80cm from any other grounded conducing surface. I/O cables and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bindle 30 cm to 40 cm long and were handed at a 40cm height to the ground plane.

Each EUT current-carrying power lead, except the ground(safety)lead, were individually connected through a LISN to the input power source.

All unused 50 ohm connectors of the LISN were resistively terminated in 50 ohm when not connected to the measuring equipment.

Frequency Band [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
0.15 to 30	EMI Receiver	Quasi-Peak	9 kHz	-
		Average	9 kHz	-

1.6.2 Radiated disturbance

EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane.

The rear of EUT, including peripherals was aligned and flush with rear of tabletop.

I/O cables that were connected to the peripherals were bundle in center.

They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged 40 cm height to the ground plane.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane and the run table azimuth was varied to obtain the maximum signal strength

The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found.

The spectrum was scanned from 30 to 1 000 MHz using biconiLog antenna.

Frequency Band [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
30 to 1 000	EMI Receiver	Quasi-Peak	120 kHz	-
Above 1 000	EMI Receiver	Peak	1 MHz	1 MHz

1.7 Test Configuration

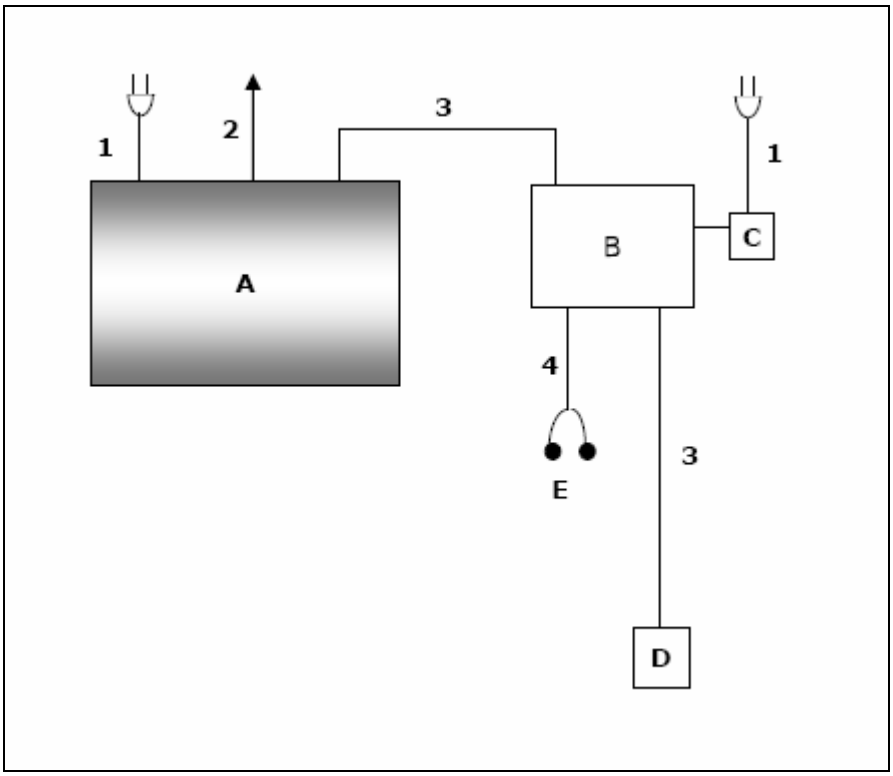
Used EUT and Peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	Remark
A	Laser Printer	GH30CPN	-	Samsung	FCC ID: **A3LGH30CPN**
B	Notebook PC	SX15	630B93CY300149J	Samsung	DoC
C	AC Adapter	AD-6019	CNBA4400162ABJ6R 531704	Samsung	-
D	USB Mouse	M-UV69a	HCA50704678	Logitech	DoC
E	Earphone	-	-	-	-

Used Cable Description

No	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	Power	1.8	No	EUT-
2	LAN(RJ45)	3.5	No	-
3	USB	1.8	Yes	-
4	Earphone	1.0	Yes	-

Block Diagram



1.8 Applied Standards

List

Product or Generic Standards	Basic Standards
FCC Part15	ANSI C63.4 : 2003

1.9 Test Facility

General Information

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 22, 16-1, 16-2.

This EMC Testing Lab. is accredited by Korea Laboratory Accreditation Scheme(KOLAS) which signed the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(s).

This Lab. is operated as testing laboratory in accordance with the requirements of ISO/IEC 17025:1998.

Accreditation and Listing

Uncertainty (According to CISPR 16-4 and Lab. 34)

Conducted Emission		**:** ±3.1 dB
Radiated Emission	Bi-Log Antenna	: ±7.3 dB

2. Summary of Test Results

Result : PASS

The equipment under test(EUT) has been found to comply with the applied standards.

Section of the Product Standard		Applied Standard	FCC Part15 Subpart B
Electromagnetic Emission Test			
3.1	Conducted Emission	ANSI C63.4 : 2003	Complied
3.2	Radiated Emission	ANSI C63.4 : 2003	Complied

3.1 Conducted Emission

Test Information	
Test Engineer	Young Hun. Cheong
Test Date	Oct 12, 2005
Climate Condition	Ambient Temperature :22.5 ℃ Relative Humidity : 58%
	Atmospheric Pressure 1016 hPa
Test Place	Shielded Room #2

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
EMI TEST RECEIVER	ESCS30	R&S	830986/004	2006-02-17	12
LISN	3810/2NM	EMCO	2251	2006-02-01	12
LISN	ESH3-Z5	R&S	100263	2006-06-06	12

Measurement Results	**Passed** The Measured emissions of the EUT have found to be below the specified limits.

Test Data & Graph

The Initial step in collecting conducted data was to perform a peak and average scan over the measurement range using a receiver

The find data represents worst-case emissions.

* QP : Quasi-peak, AV: Average

* Result = Meter Reading(QP or AV) + Total Loss(LISN Insertion loss + Cable loss)

* Margin = Limit – Result

1. - TEST DATA & GRAPH

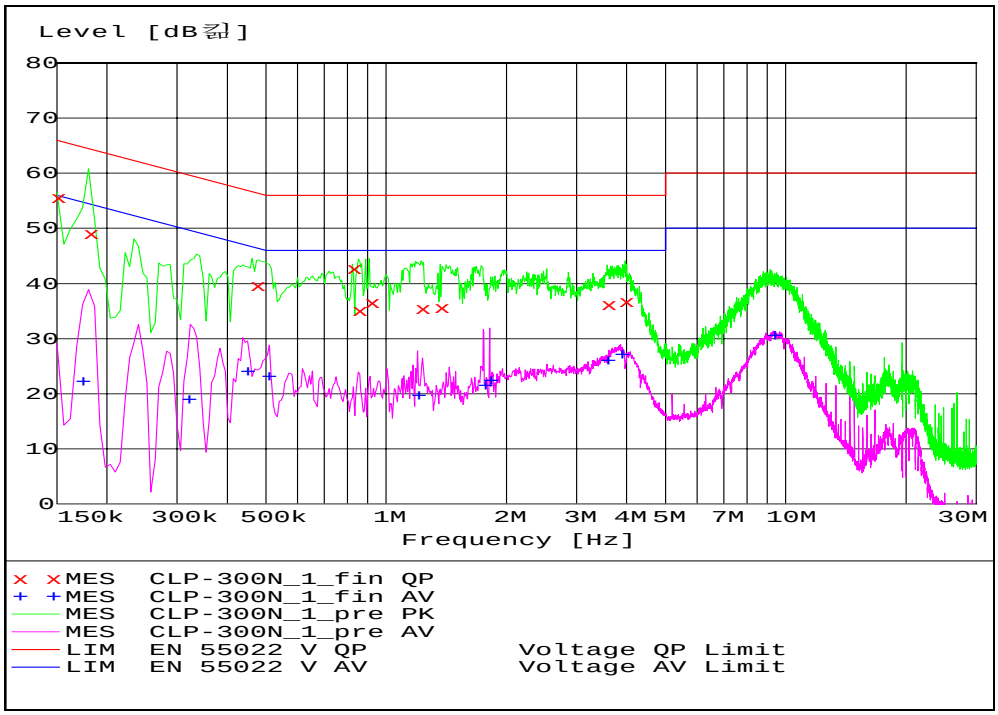
1-1. Quasi Peak Table

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150000	55.60	0.2	66	10.4	N	GND
0.181000	49.00	0.1	64	15.5	N	GND
0.472000	39.60	0.1	57	16.8	N	GND
0.824000	42.70	0.1	56	13.3	N	GND
0.852000	35.10	0.1	56	20.9	N	GND
0.914000	36.50	0.1	56	19.5	N	GND
1.222000	35.40	0.2	56	20.6	N	GND
1.365000	35.60	0.2	56	20.4	N	GND
3.580000	36.10	0.2	56	19.9	N	GND
3.961000	36.70	0.3	56	19.3	N	GND

1-2. Average Table

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.318000	18.90	0.1	50	30.8	N	GND
0.446000	24.10	0.2	47	22.8	N	GND
0.504000	23.10	0.1	46	22.9	N	GND
1.194000	19.70	0.2	46	26.3	N	GND
1.755000	21.40	0.2	46	24.6	N	GND
1.815000	22.40	0.2	46	23.6	L1	GND
3.570000	26.00	0.2	46	20.0	L1	GND
3.860000	27.00	0.3	46	19.0	N	GND

- **Graph –**



3.2 Radiated Emission

Test Information	
Test Engineer	Young Hun. Cheong
Test Date	Oct 05, 2005
Climate Condition	Ambient Temperature : 19.5 ℃ Relative Humidity : 50 %
	Atmospheric Pressure 1 001 hPa
Test Place	10m Semi Anechoic Chamber

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Turn Table	DT430	HD	430/691/01	N/A	N/A
Antenna Mast	MA240	HD	240/678 BJ:01	N/A	N/A
Controller	HD100	HD	100/723	N/A	N/A
Preamplifier	CPA9232	Schaffner	1054	2006-02-07	12
BILOG Antenna	CBL6112B	Schaffner	2804	2005-11-09	12
Test Receiver	ESI26	R&S	100010	2006-09-22	12

Measurement Results	**Passed** The measured emissions of the EUT have found to be below the specified limits.

Test Data & Graph

The initial step in collecting radiated data was to perform a peak scan over the measurement range using a receiver. All modes of operation were investigated and the worst-case emissions are reported. All other emission are non-significant.

The minimum margin to the limit is as follows:

All other emission are non-significant.

* Receiving Antenna Mode : Horizontal, Vertical

* Test distance : 10m (RF Semi Anechoic Chamber)

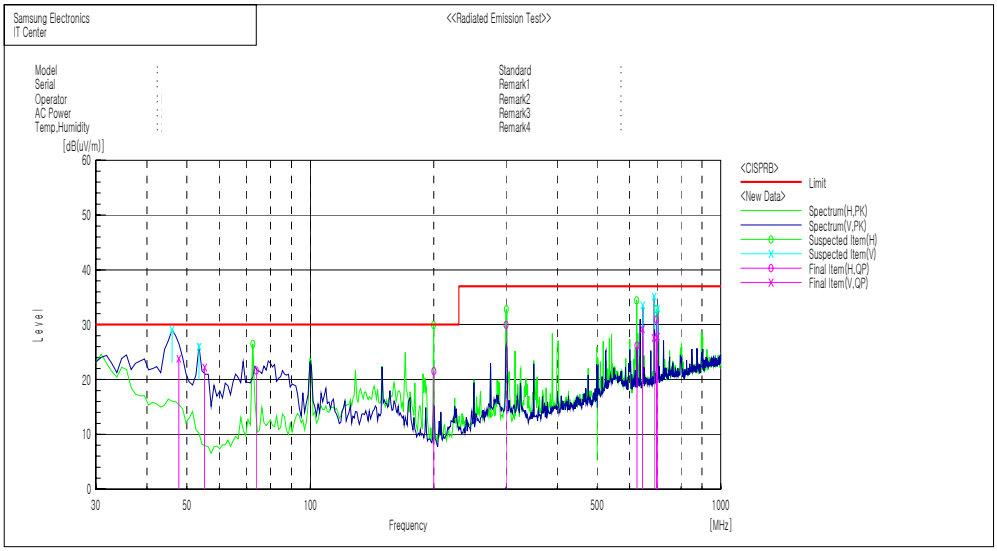
* Result = Meter Reading + c.f (Antenna factor + Cable loss)

* Margin = Limit – Result

1. Normal Running

- Graph & Data -

Samsung Electronics Co., Ltd
IT Center



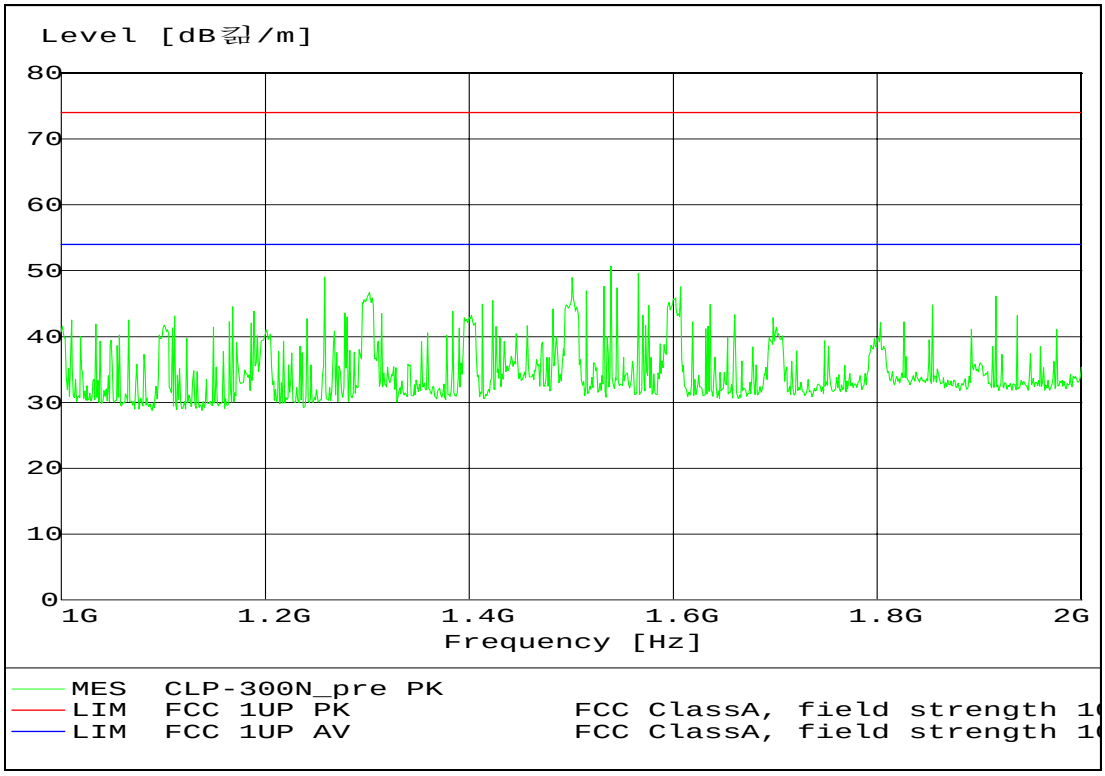
Final Result

No.	Frequency	(P)	S.C	Reading QP	c.f	Result QP	Limit	Margin QP	Height	Angle	Remark
	[MHz]			[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	47.787	V	S	34.9	-11.1	23.8	30.0	6.2	161.0	348.0	
2	55.285	V	S	36.0	-13.8	22.2	30.0	7.8	110.0	208.0	
3	73.812	H	S	35.5	-13.9	21.6	30.0	8.4	400.0	80.0	
4	199.996	H	S	31.7	-10.2	21.5	30.0	8.5	374.0	182.0	
5	300.015	H	S	35.2	-5.2	30.0	37.0	7.0	266.0	131.0	
6	625.045	H	S	23.9	2.3	26.2	37.0	10.8	398.0	262.0	
7	644.554	V	S	26.5	2.7	29.2	37.0	7.8	389.0	161.0	
8	688.151	V	S	24.4	3.2	27.6	37.0	9.4	233.0	113.0	
9	697.530	H	S	27.5	3.4	30.9	37.0	6.1	105.0	332.0	
10	700.747	V	S	24.4	3.5	27.9	37.0	9.1	199.0	230.0	

■ **Test Data (1GHz~2GHz)**

Freq. [Mhz]	Reading [dBuV/m]	c.f [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Azimuth [*]	Polarization
1258.00	24.5	24.5	49.01	74	24.99	100.0	120.0	HORIZONTAL
1501.00	23.9	25.0	48.93	74	25.07	100.0	240.0	VERTICAL
1532.00	22.4	25.2	47.61	74	26.39	100.0	0.0	VERTICAL
1539.00	25.5	25.2	50.67	74	23.33	100.0	0.0	HORIZONTAL
1566.00	23.5	26.1	49.65	74	24.35	100.0	240.0	VERTICAL

- **Graph –**

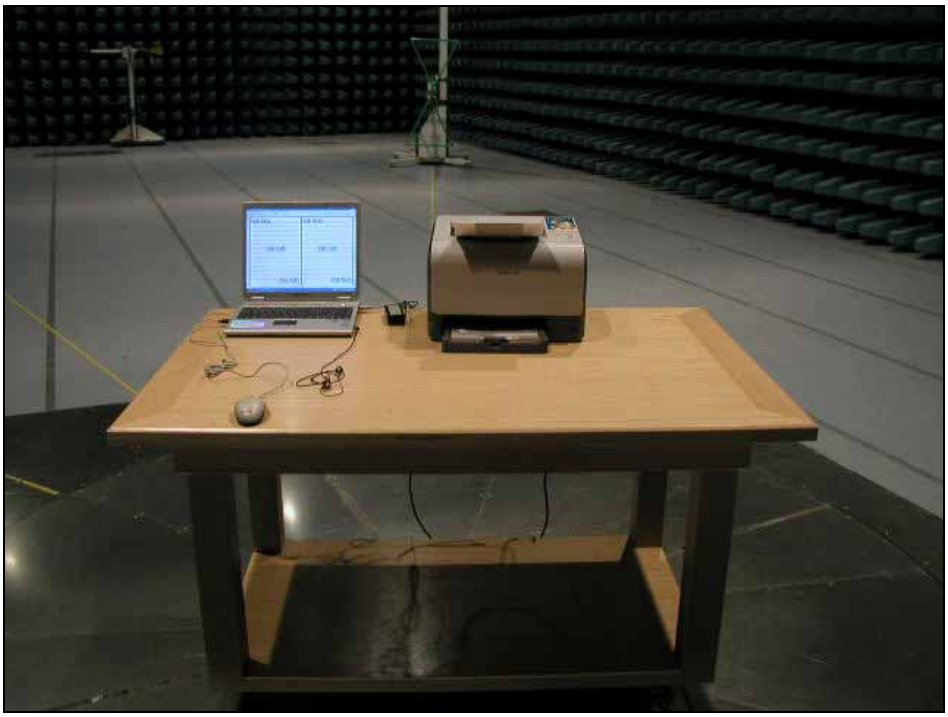


4. Appendix

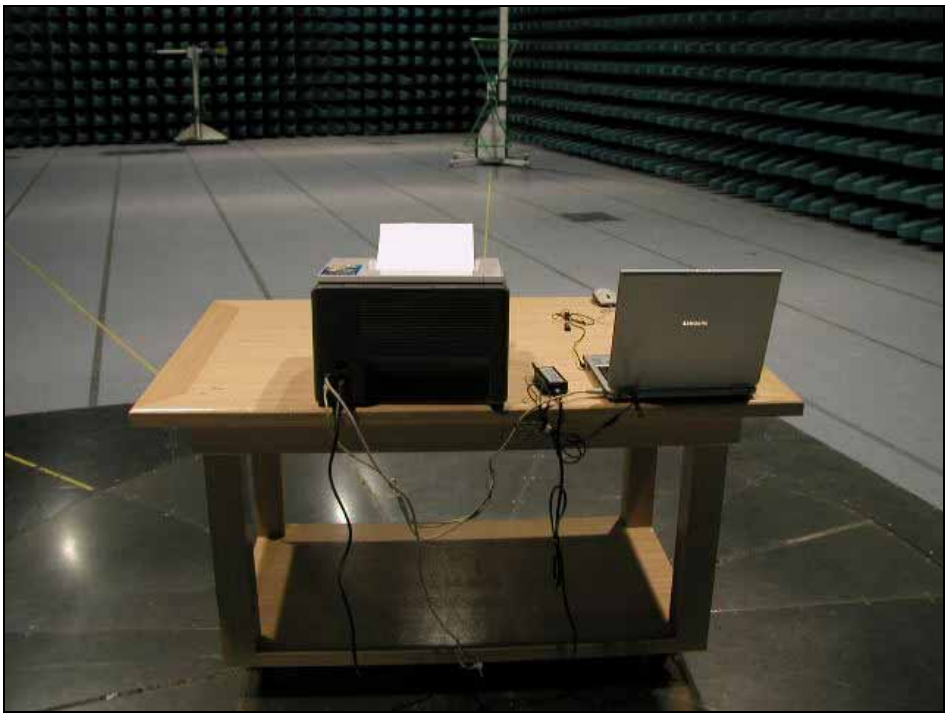
4.1 Test Photography

Pic. 1 Conducted Emission (Front)

Pic. 2 Conducted Emission (Rear)



Pic. 3. Radiated Emission (Front)



Pic. 4. Radiated Emission (Rear)

4.2 EUT Photography

Pic. 5 EUT (Front)

Pic. 6 EUT (Rear)

Pic. 7 EUT (Label)

Pic 8. Label location