EMC Test Report

According to FCC Part 15 Subpart B

Project No.	LBE050578
Equipment under Test	
Applicant	Samsung Electronics Co., Ltd. 416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
FCC ID	**A3LSPP-2020**
Product Name	Photo Printer
Model Name	SPP-2020
Manufacturer	1) Samsung Electronics Co., Ltd. 259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, 730-030, KOREA 2) Shandong Samsung Telecommunications Co., Ltd. #264209, Samsung Road, Weihai Hi-Tech IDZ Shandong Province CHINA 3) Intops(Weihai) Electronics Co., Ltd. 3, Huoju Road, Weihai Hi-tech IDZ Shandong Province CHINA
Date of Test	March 8, 2005
Issued Date	March 23, 2005

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

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

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1. General Information

1.1 Basic Information related Product

Applicant	Samsung Electronics Co., Ltd.
Model name	SPP-2020
Applicant Address	416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
Contact Person	Young Hun, Cheong
Kind of product	Photo Printer
Valiant list	-
Manufacturer	1) Samsung Electronics Co., Ltd. 259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, 730-030, KOREA 2) Shandong Samsung Telecommunications Co., Ltd. #264209, Samsung Road, Weihai Hi-Tech IDZ Shandong Province CHINA 3) Intops(Weihai) Electronics Co., Ltd. 3, Huoju Road, Weihai Hi-tech IDZ Shandong Province CHINA
New / Alternative / Permissive change Information	New

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1.2 Detail Information related Product

Specification

Item	Specification	Remark
Interface	PC (USB 1.1 and USB 2.0) PictBridge	-
Memory Size	SDRAM : 16MB Flash : 1MB	-
Printing Method	D2T2(Dye diffusion Thermal Transfer)	-
Printing Resolution	300 x 300 dpi	-
Printing Speed	About 1 min./4x6”	-
Power Adaptor	Input: AC 110~240V 50/60Hz Output: DC 24V 1.7A	-
Interface	PC (USB 1.1 and USB 2.0) PictBridge	-

Operating Frequency

Main Clock is 48MHz and SDRAM clock is 132MHz

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.

1.4 Test System Details

Refer to 1.2

1.5 Equipment Modifications

No equipment modifications were required.

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1.6 Test Procedure

1.6.1 Conducted Emission

EUT was placed on a platform nominal size, 1m by 1.5m, raised 80cm above the conducti ng ground plane. The rear of tabletop was located 40cm to the vertical conducting groud 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 30cm to 40cm 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.

1.6.2 Radiated Emission

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm 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 30cm to 40cm long and were hanged 40cm 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 1000 MHz using biconiLog antenna.

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1.7 Test Configuration

Used EUT and Peripherals

Seq	Device	Model Name	Serial #	Maker	FCC ID / DoC
A	Photo Printer	SPP-2020	-	Samsung	A3LSPP-2020
B	AC Adaptor	ADP-4024W	-	Samsung	-
C	Note Book PC	Q10	-	Samsung	DoC
D	AC Adaptor	AD-4212	-	Samsung	-
E	Camera	PC1059	8241001965	Canon	DoC
F	PS/2 Mouse	P801	02161517	Samsung	DoC
G	USB Mouse	M-UR69a	LNR24400132	Logitech	DoC
H	Serial Mouse	37964	1022953	Microsoft	C3KMS1

Used Cable Description

	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	AC Power Cable	1.8	N	-
2	USB Cable	1.8	Y	-
3	USB Cable	1.8	Y	-
4	Serial Cable	1.8	Y	-
5	PS/2 Cable	1.8	Y	-
6	USB Cable	1.8	Y	-

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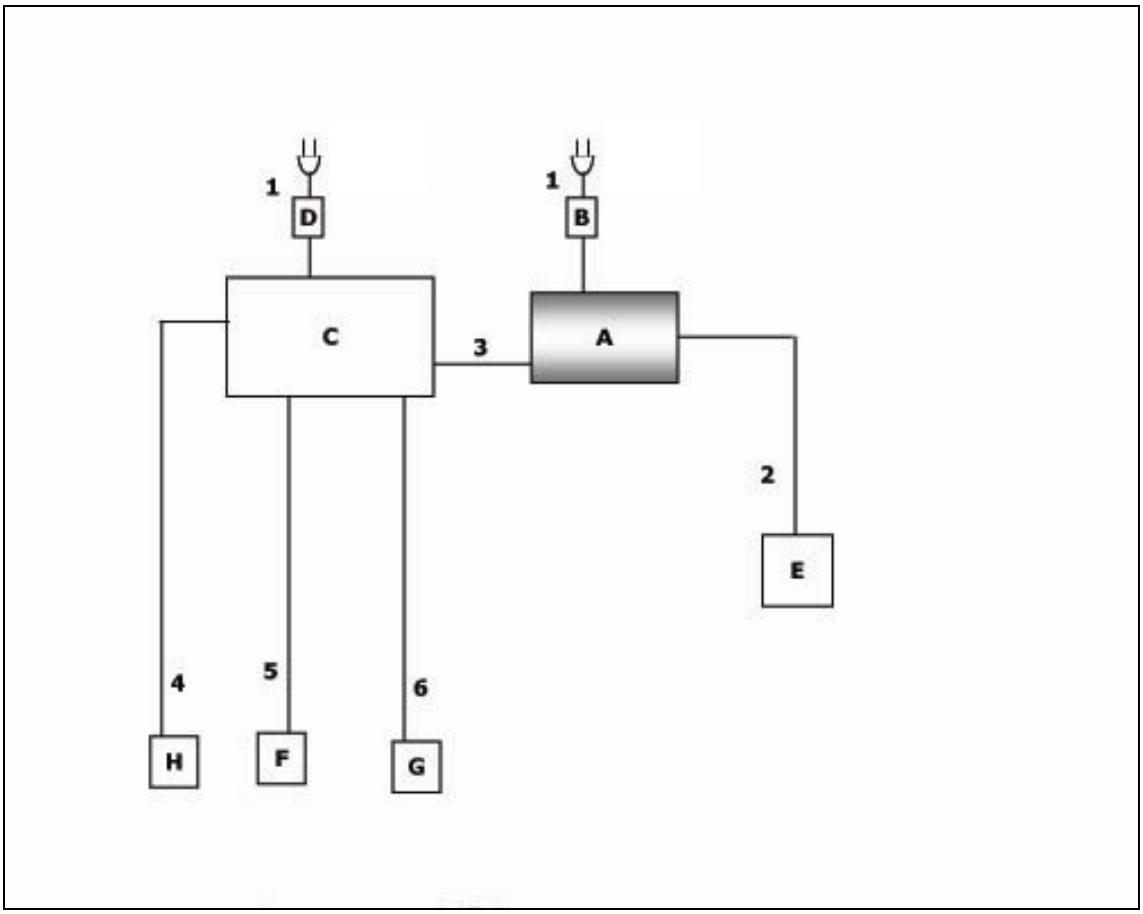
Block Diagram



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1.8 Applied Standards

List

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

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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 Agreement(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 NAMAS Pub.NIS81)

Samsung IT EMC Test Lab.

Conducted Emission		**:** ±1.9dB
Radiated Emission	Bi-Log Antenna	**:** ±5.1dB

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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	Result
Electromagnetic Emission Test			
3.1	Conducted Emission	ANSI C63.4 : 2003	Complied
3.2	Radiated Emission	ANSI C63.4 : 2003	Complied

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3.1 Conducted Emission

Test Information	
Test Engineer	Young Hun, Cheong
Test Date	March 08, 2005
Climate Condition	Ambient Temperature : 25.5 ℃ Relative Humidity : 33%
	Atmospheric Pressure 1016mbar
Test Place	Shield Room

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	ESH3-Z5	R&S	100263	2005-05-25	12
LISN	ESH3-Z5	R&S	831887/004	2005-08-31	12

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

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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

MEASUREMENT RESULT: "SPP-2020_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.170000	53.50	0.6	65	11.5	L1	FLO
0.225000	54.00	0.5	63	9.0	L1	FLO
3.660000	32.10	0.7	56	23.9	N	FLO
3.770000	34.40	0.7	56	21.6	N	FLO
3.940000	33.80	0.8	56	22.2	N	FLO
4.050000	37.00	0.8	56	19.0	N	FLO
4.495000	39.20	0.8	56	16.8	L1	FLO
4.665000	39.70	0.8	56	16.3	L1	FLO
4.780000	38.20	0.8	56	17.8	L1	FLO
4.945000	39.10	0.8	56	16.9	L1	FLO

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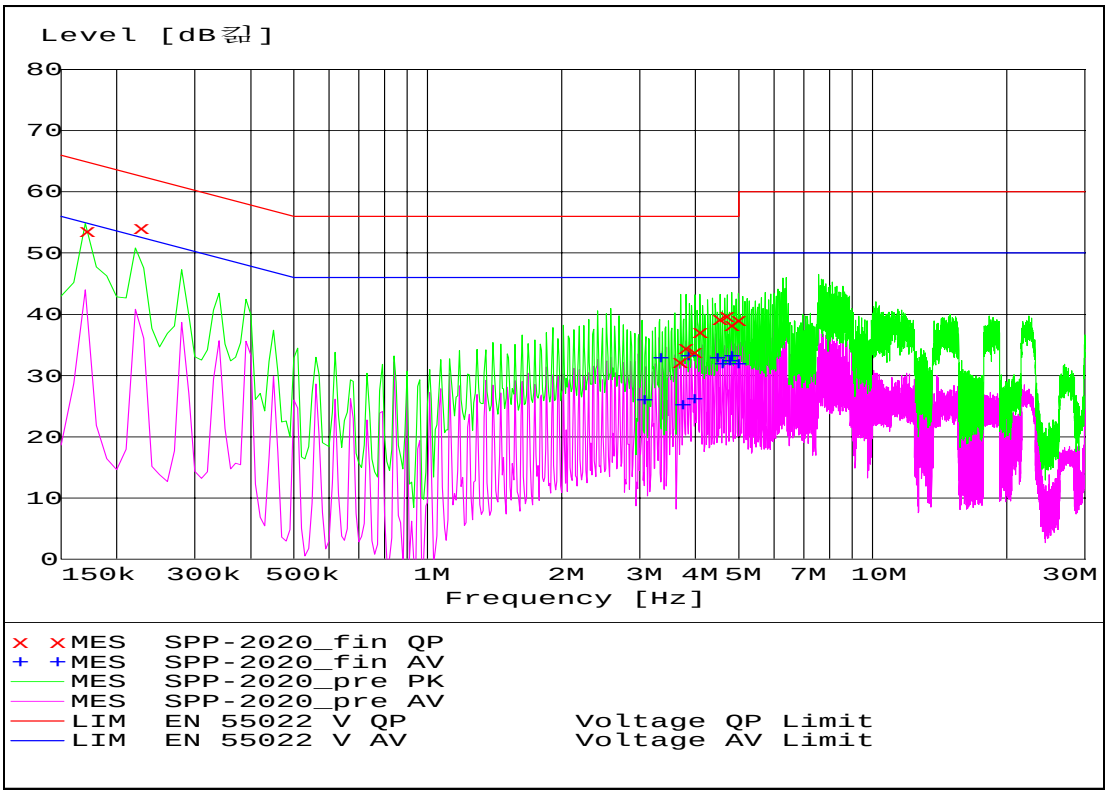
1.2 Average

MEASUREMENT RESULT: "SPP-2020_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
3.040000	26.00	0.6	46	20.0	N	FLO
3.315000	32.80	0.6	46	13.2	L1	FLO
3.715000	25.20	0.7	46	20.8	L1	FLO
3.820000	33.20	0.8	46	12.8	N	FLO
3.940000	26.10	0.8	46	19.9	N	FLO
4.440000	32.80	0.8	46	13.2	N	FLO
4.550000	31.80	0.8	46	14.2	N	FLO
4.725000	32.40	0.8	46	13.6	N	FLO
4.780000	33.10	0.8	46	12.9	N	FLO
4.950000	31.90	0.8	46	14.1	N	FLO

- Graph -



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3.2 Radiated Emission

Test Information	
Test Engineer	Young Hun, Cheong
Test Date	March 08, 2005
Climate Condition	Ambient Temperature : 21.5℃ Relative Humidity : 52%
	Atmospheric Pressure 1019mbar
Test Place	10m Semi Anechoic Chamber

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Test Receiver	ESIB-26	R&S	100147	2005-10-04	12
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	1053	2005-08-14	12
BILOG Antenna	CBL6112B	Schaffner	2804	2005-11-09	12

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

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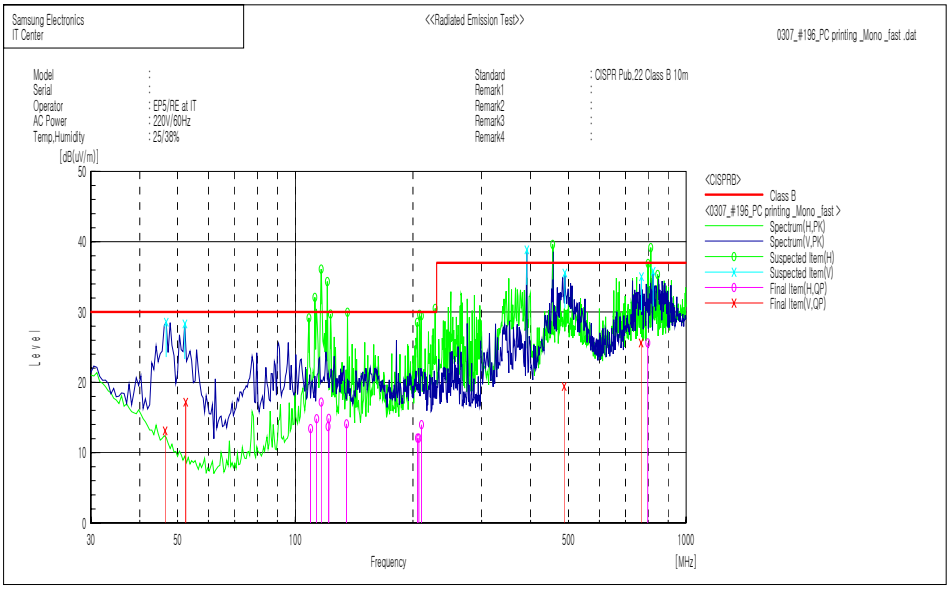
Test Data & Graph

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 emission are reported. The minimum margin to the limit is as follows:
All other emission are non-significant.

* Receiving Antenna Mode : Horizontal, Vertical
* Test distance : 10m (Semi-Anechoic Chamber)
* Result = Meter Reading + Total Loss(Antenna factor + Cable loss-Amp. Gain)
* Margin = Limit – Result

Samsung Electronics Co., Ltd
IT Center



Final Result

No.	Frequency [MHz]	(P)	S.C	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	46.452	V	S	23.6	-10.5	13.1	30.0	16.9	103.0	117.0	
2	52.425	V	S	30.1	-12.9	17.2	30.0	12.8	183.0	296.0	
3	109.542	H	S	21.6	-8.2	13.4	30.0	16.6	367.0	12.0	
4	113.432	H	S	22.6	-7.8	14.8	30.0	15.2	339.0	10.0	
5	116.554	H	S	24.8	-7.6	17.2	30.0	12.8	389.0	182.0	
6	121.337	H	S	21.2	-7.5	13.7	30.0	16.3	398.0	183.0	
7	121.884	H	S	22.4	-7.5	14.9	30.0	15.1	382.0	216.0	
8	135.341	H	S	22.1	-8.0	14.1	30.0	15.9	391.0	218.0	
9	205.384	H	S	22.1	-10.1	12.0	30.0	18.0	389.0	25.0	
10	207.142	H	S	22.1	-10.0	12.1	30.0	17.9	396.0	142.0	
11	210.432	H	S	23.9	-9.9	14.0	30.0	16.0	223.0	111.0	
12	487.352	V	S	19.9	-0.5	19.4	37.0	17.6	355.0	0.0	
13	767.029	V	S	20.9	4.7	25.6	37.0	11.4	255.0	42.0	
14	798.003	H	S	20.8	4.8	25.6	37.0	11.4	101.0	148.0	

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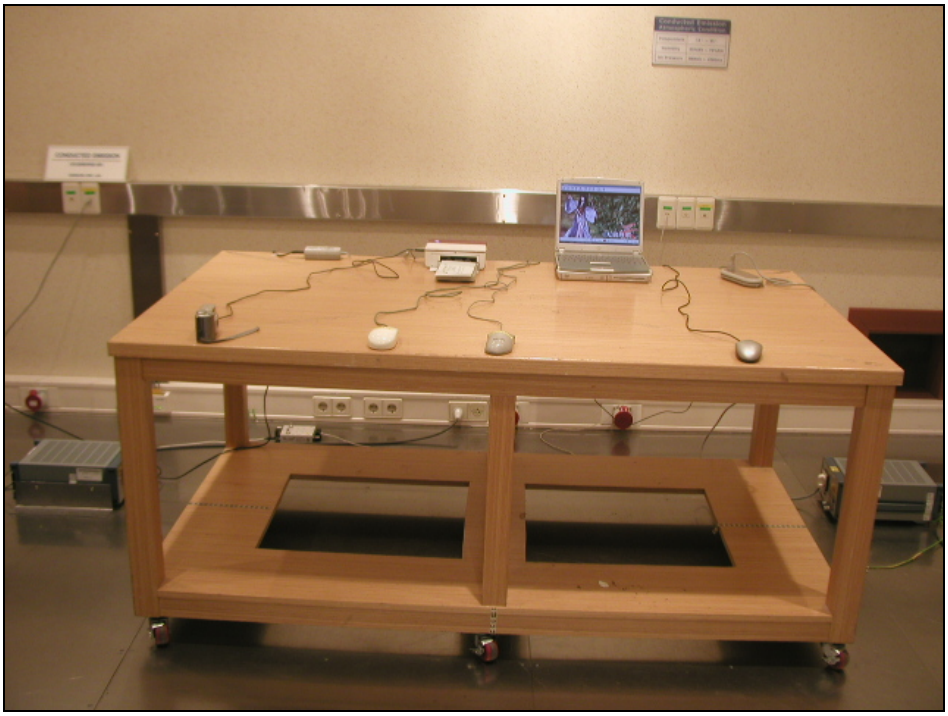
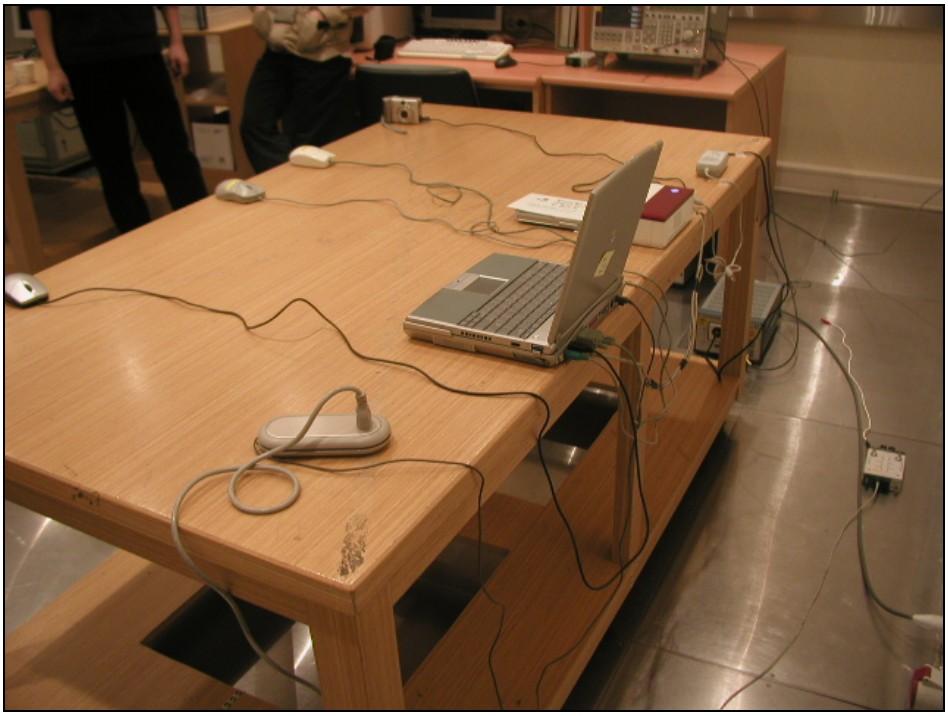
4. Appendix

4.1 Test Photography



Picture 1. Conducted Emission (Front)



Picture 2. Conducted Emission (Rear)

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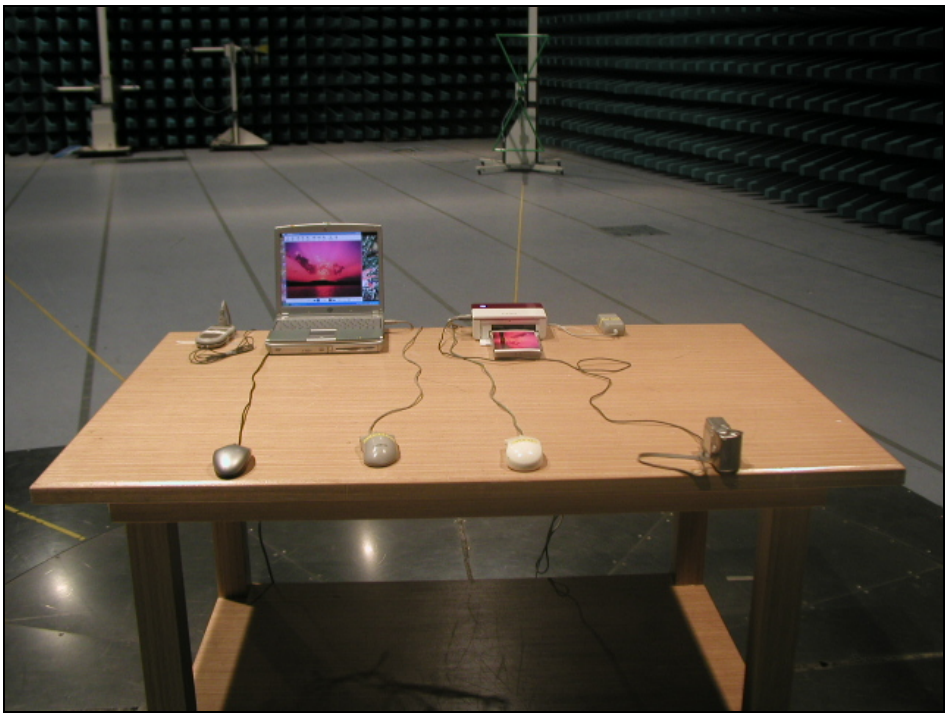
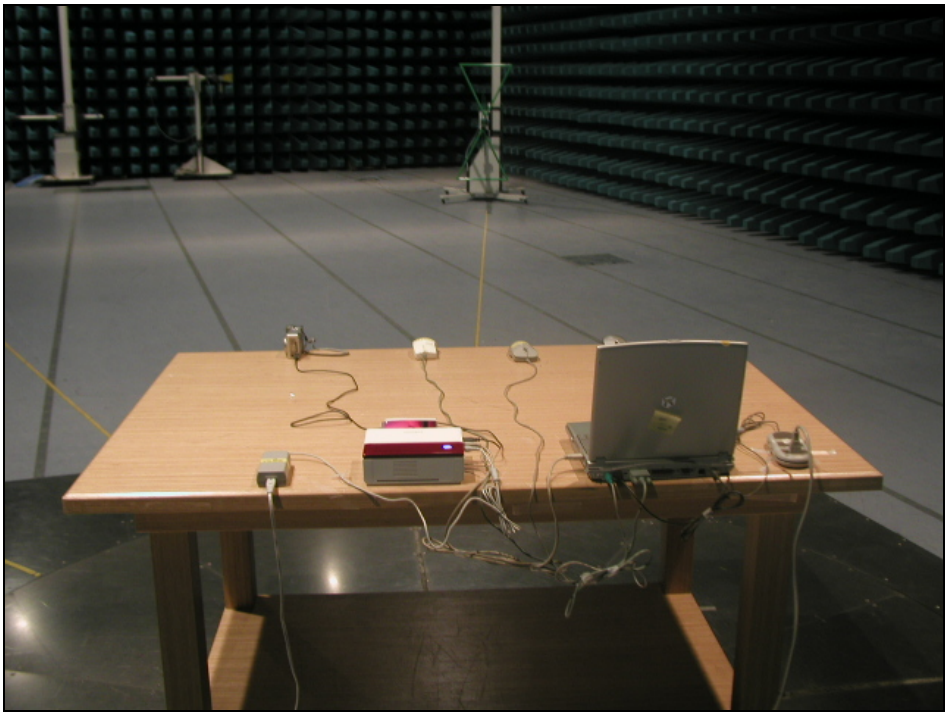


Picture 3. Radiated Emission (Front)



Picture 4. Radiated Emission (Rear)

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4.2 EUT Photography

Picture 5. EUT (Top)

Picture 6. EUT (Bottom)

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SAMSUNG

Model No. : SPP-2020
Volts: DC 24V ⎓
Amps: 1.7A
Manufactured: MARCH 2005

c UL us LISTED 51Y7 E149091 I.T.E.

Serial No.

This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.
FCC ID:A3LSPP-2020

This Class B digital apparatus complies with Canadian ICES-003

Cet appareil numérique de la classe B est conforme à la morme NMB-003 du Canada.

For applicable power supplies see user-instructions

MADE IN KOREA REV.00

- Label (Samsung Electronics Co., Ltd.)

SAMSUNG

Model No. : SPP-2020
Volts: DC 24V ⎓
Amps: 1.7A
Manufactured: MARCH 2005

c UL us LISTED 51Y7 E149091 I.T.E.

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This Class B digital apparatus complies with Canadian ICES-003

Cet appareil numérique de la classe B est conforme à la morme NMB-003 du Canada.

For applicable power supplies see user-instructions

MADE IN CHINA REV.00

- Label (Shandong Samsung Telecommunications Co., Ltd. and Intops(Weihai) Electronics Co., Ltd.)

Picture 7. EUT (Label)

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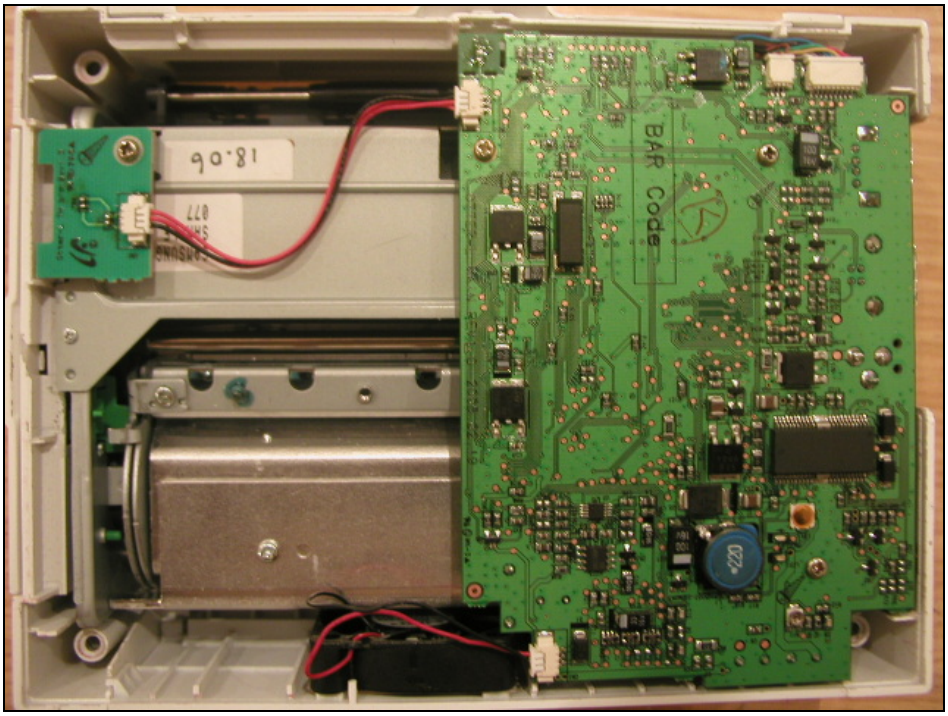

Picture 8. EUT (Inside)

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