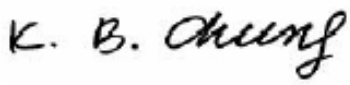


EMC Test Report

According to FCC Part 15 Subpart B

Project No.	LBE041534
Equipment under Test	Multi Function Printer
Applicant	Samsung Electronics Co. Ltd; 416 Maetan3-Dong, YeoungTong-Gu, Suwon City, Gyeonggi-Do, Korea, 443-742
FCC ID	A3LSCX4720F
Product Name	Multi Function Printer
Model Name	SCX-4720F
Variant Model	SCX-4520, WorkCentre PE120i, WorkCentre PE120, WorkCentre PE120e
Manufacturer	- Samsung Electronics Co., Ltd. 259, Gongdan-Dong, Gumi-City, Kyung-Buk, 730-030, Korea - Shandong Samsung Telecommunications Co. Ltd. Sanxing Road, Weihai Hi-Tech, IDZ shandong Province, 264209, China
Date of Test	July 08, 2004 ~ July 30, 2004
Issued Date	August 02, 2004

	Name/Position	Signature
Tested by	Min Gon, Kim Test Engineer	
Reviewed by	No Cheon, Park Manager of EMC Lab.	
Authorized by	Kyu Baek, Chung 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

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1. General Information

1.1 Basic Information related Product

Applicant	Samsung Electronics Co. Ltd;
Model name	SCX-4720F
Applicant Address	Samsung Electronics Co. Ltd; 416 Maetan3- Dong, Yeoungtong-Gu, Suwon City, Gyeonggi-Do, Korea, 443-742
Contact Person	Gwang Hyun, Jo
Kind of product	Multi Function Printer
Valiant list	SCX-4520, WorkCentre PE120i, WorkCentre PE120, WorkCentre PE120e
Manufacturer	- Samsung Electronics Co., Ltd. 259, Gongdan-Dong, Gumi-City, Kyung-Buk, 730-030, Korea - Shandong Samsung Telecommunications Co. Ltd. Sanxing Road, Weihai Hi-Tech, IDZ shandong Province, 264209, China
New / Alternative / Permissive change Information	USB host chip : 6MHz crystal → 6MHz Oscillator

1.2 Detail Information related Product

Specification

General Specification	
Consumables	1-piece toner cartridge system
Power consumption	Sleep mode : 19W Average : 400W
Warm-up Time	Less than 30 seconds
Toner Cartridge Life	5,000 pages (for starter, 3,000 pages) @ ISO 19752 5% Coverage
Power requirements	110~127 VAC, 50/60Hz, 5.0A (FCC) 220~240 VAC, 50/60Hz, 2.6A (CE)
Set Dimension (W x D x H)	440 x 435 x 457 mm

Weight	Net : 13 Kg(including consumables) Gross : 21 Kg (including consumables, accessories and package)
Scanner and Copier Specifications	
Compatibility	TWAIN standard
Scanning method	ADF and Flat-bed Color CCD(Charge Coupled Device) module
Scan resolution	600 x 1200 dpi(Mono and color) Enhanced : 4800 x 4800 dpi (USB)
Scan Speed	27 seconds (Text mode), 75 seconds (Gray mode) 150 seconds (Color mode)
Copy Speed	Letter : Up to 22 pages per minute A4 : Up to 20 pages per minute
Copy resolution	Scan : 600 x 300 dpi(Text, Mixed)/ 600 x 600 dpi(Photo) Print : 600 x 600 dpi (Text, Mixed, Photo)
Printer Specifications	
Printing method	Laser Beam Printing
Printing speed	Letter : Up to 22 pages per minute A4 : Up to 20 pages per minute
Print resolution	600 x 600 dpi (1200 x 600 dpi)
Emulation	PCL6 Compatible
PC interface	Compatible with USB 2.0 Specifications and IEEE1284 Parallel
Memory	32MB(Max. 160MB)
First printing time	Standby mode : 12 seconds Power save mode : 54 seconds
Options	Ethernet 10/100 Base TX(Internal), Ethernet 10/100 Base TX + 802.11b Wireless LAN (Internal)
Facsimile Specifications (For the SCX-4720F)	
Compatibility	ITU-T Group 3
Modem speed	33.6 Kbps
Resolution	Standard : 203 x 98 dpi Fine : 203 x 196 dpi Super Fine : 300 x 300 dpi/203 x 392 dpi
User Memory	4MB(320 pages)
Applicable line	Public Switched Telephone Network (PSTN) or behind PABX

Operating Frequency

Wireless LAN : 2.4GHz

Video Clock : 19.61374 MHz

CPU clock : 12MHz

SDRAM Clock : 60MHz

CCD Clock : 8 MHz

Modem Clock : 28.224 MHz

1.3 Operating Mode and Test Condition

The system was configured for testing in typical fashion use. Cable were attached to each of the available I/O port. Where applicable, peripherals were attached to the I/O cables.

This EUT have Wireless Printing server function so Host PC link to EUT and transfer print file formation "H" character document continuously.

1.4 Test System Details

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, 1m by 1.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting grounding 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 conducting 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 disturbance

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 biconi-Log antenna.

1.7 Test Configurations

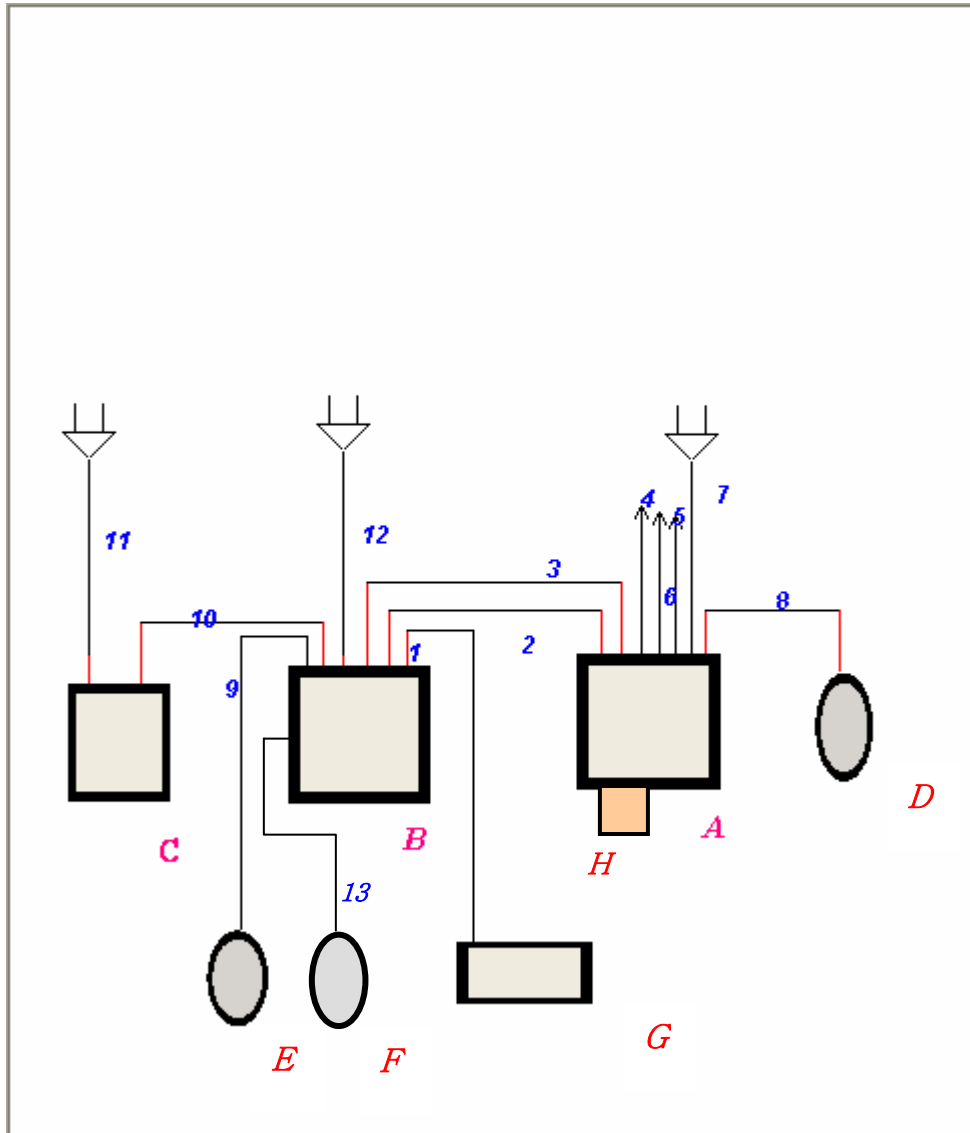
Used EUT and Peripherals

Seq	Device	Model Name	Serial #	Maker	Note
A	MFP	SCX-4720F	-	Samsung	EUT
B	Desk Top PC	Neivista 8311	KAA6842	IBM	-
C	Monitor	CX151X	N209H4NT726970	Samsung	-
D	Telephone	SP-F008	KKBR237456	Samsung	-
E	Mouse	M-UR59	LNR24400132	Logitech	-
F	Mouse	SMB-400	7DEF021843	Sejin	-
G	Keyboard	RT3602	41722012	Gateway	-
H	USB Memory	MD3100	-	memorydrive	-

Used Cable Description

	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	PS/2	1.7	No	Keyboard
2	USB	1.7	No.	MFP
3	Parallel (Printer)	1.8	Yes	MFP
4	Wireless LAN	-	-	Antenna Port
5	TEL (RJ11)	3.0	No	MFP
6	LAN (RJ45)	3.0	No	MFP
7	Power	1.7	No	MFP
8	TEL (RJ11)	3.0	No	Telephone
9	USB	1.7	No	Mouse
10	VGA Cable	1.5	No	-
11	Power	1.7	No	Monitor
12	Power	1.7	No	PC
13	Serial	1.5	No	Mouse

Block Diagram



1.8 Applied Standards

List

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

Performance Criteria

- A. normal performance within the specification limits
- B. temporary degradation or less of function or performance which is self-recoverable
- C. temporary degradation or less of function or performance which require operator intervention or system reset

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, 11.

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



Reg. No. 124



Reg. No. KR0004



LAB CODE 200623-0



eg. No.98856



No.189



R-1221,C-1095



App. No.001



H9354285

Uncertainty

(According to NAMAS Pub.NIS81)

Samsung IT EMC Test Lab.

Disturbance voltage at Mains : $\pm 1.9\text{dB}$

Radiated disturbance Bi-Log Antenna : $\pm 5.1\text{dB}$

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	
3.2	Radiated Emission	ANSI C63.4	

3. Description of Individual Tests

3.1 Conducted Emission

Test Information	
Test Engineer	Min Gon, Kim
Test Date	July 30, 2004
Climate Condition	Ambient Temperature : 24.5 °C Relative Humidity : 57%
	Atmospheric Pressure : 1001mbar
Test Place	Shield Room

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
LISN	ESH3-Z5	R&S	831887/004	2004-10-01	12
LISN	3810/2NM	EMCO	2251	2005-02-07	12
EMI RECEIVER	ESCS30	R&S	830986/004	2005-02-12	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

* Level = Meter Reading(QP or AV) + Transd (LISN Insertion loss + Cable loss)

* Margin = Limit – Level

1. Printing Operation - TEST DATA & GRAPH

1. Quasi-Peak Table

MEASUREMENT RESULT: "4720F_LV_P2_fin QP"

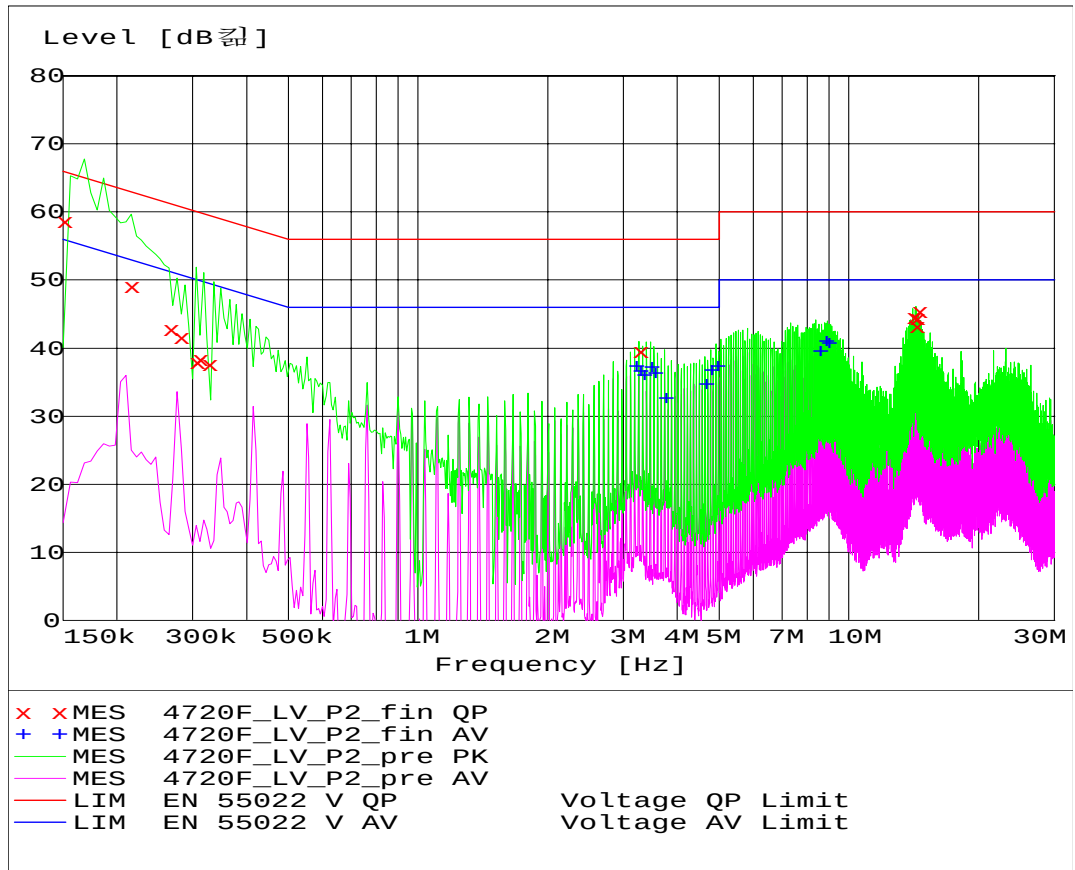
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150000	58.60	0.6	66	7.4	L1	GND
0.215000	49.10	0.5	63	13.9	N	GND
0.265000	42.70	0.5	61	18.6	L1	GND
0.280000	41.50	0.5	61	19.3	N	GND
0.305000	37.90	0.5	60	22.2	L1	GND
0.310000	38.30	0.5	60	21.6	N	GND
0.325000	37.60	0.5	60	21.9	L1	GND
3.255000	39.50	0.6	56	16.5	N	GND
14.050000	44.50	1.5	60	15.5	N	GND
14.255000	43.20	1.5	60	16.8	L1	GND
14.325000	44.40	1.5	60	15.6	L1	GND
14.465000	45.40	1.6	60	14.6	L1	GND

2. Average Table

MEASUREMENT RESULT: "4720F_LV_P2_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dB μ V	dB	dB μ V	dB		
3.185000	37.20	0.6	46	8.8	L1	GND
3.255000	36.50	0.6	46	9.5	L1	GND
3.320000	36.00	0.6	46	10.0	L1	GND
3.460000	37.10	0.7	46	8.9	N	GND
3.530000	36.30	0.7	46	9.7	L1	GND
3.735000	32.60	0.7	46	13.4	N	GND
4.635000	34.70	0.8	46	11.3	N	GND
4.775000	36.70	0.8	46	9.3	L1	GND
4.915000	37.20	0.8	46	8.8	L1	GND
8.515000	39.50	1.1	50	10.5	L1	GND
8.790000	40.90	1.2	50	9.1	L1	GND
8.930000	40.70	1.2	50	9.3	L1	GND

- Graph -



3.2 Radiated Emission

Test Information	
Test Engineer	Min Gon, Kim
Test Date	July 08, 2004
Climate Condition	Ambient Temperature : 22.5℃ Relative Humidity : 57%
	Atmospheric Pressure : 1003mbar
Test Place	10m RF Semi Anechoic Chamber

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Test Receiver	ESI26	R&S	100019	2005-02-16	12
Turn Table	DT430	HD	430/691/01	N/A	N/A
BILOG ANTENNA	CBL6112B	SCHAFFNER	2805	2005-02-23	12
Antenna Mast	MA240	HD	240/678 BJ:01	N/A	N/A
Controller	HD100	HD	100/723	N/A	N/A

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 emission are reported

The minimum margin to the limit is as follows:

All other emission are non-significant.

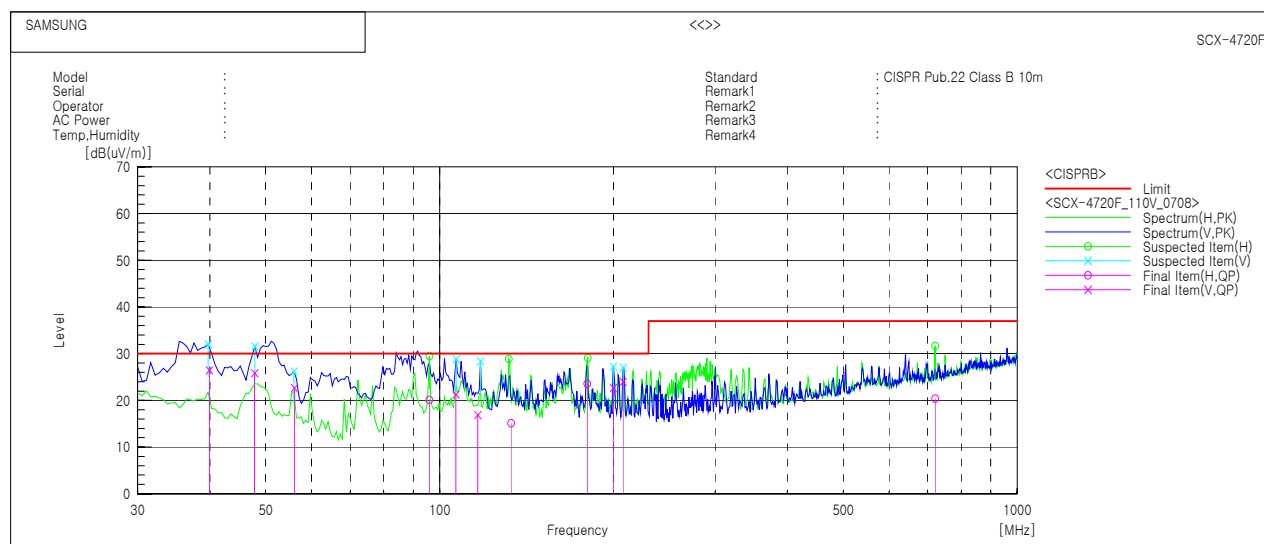
* Receiving Antenna Mode : Horizontal, Vertical

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

* Result = Meter Reading + Total Loss(Antenna factor + Cable loss)

* Margin = Limit – Result

1. Copy Operation - TEST DATA & GRAPH



Final Result

No.	Frequency [MHz]	(P)	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	39.932	V	33.4	-6.9	26.5	30.0	3.5	113.0	66.0	
2	47.821	V	36.7	-10.9	25.8	30.0	4.2	108.0	309.0	
3	56.023	V	36.8	-14.2	22.6	30.0	7.4	257.0	173.0	
4	95.977	H	30.2	-10.1	20.1	30.0	9.9	335.0	274.0	
5	106.734	V	29.5	-8.2	21.3	30.0	8.7	149.0	355.0	
6	116.424	V	24.0	-7.1	16.9	30.0	13.1	115.0	72.0	
7	132.971	H	22.4	-7.3	15.1	30.0	14.9	351.0	127.0	
8	180.126	H	33.9	-10.3	23.6	30.0	6.4	321.0	276.0	
9	199.908	V	32.9	-10.2	22.7	30.0	7.3	107.0	312.0	
10	207.856	V	33.9	-9.9	24.0	30.0	6.0	104.0	329.0	
11	721.340	H	16.8	3.6	20.4	37.0	16.6	103.0	235.0	

4. Appendix

4.1 Test Photography



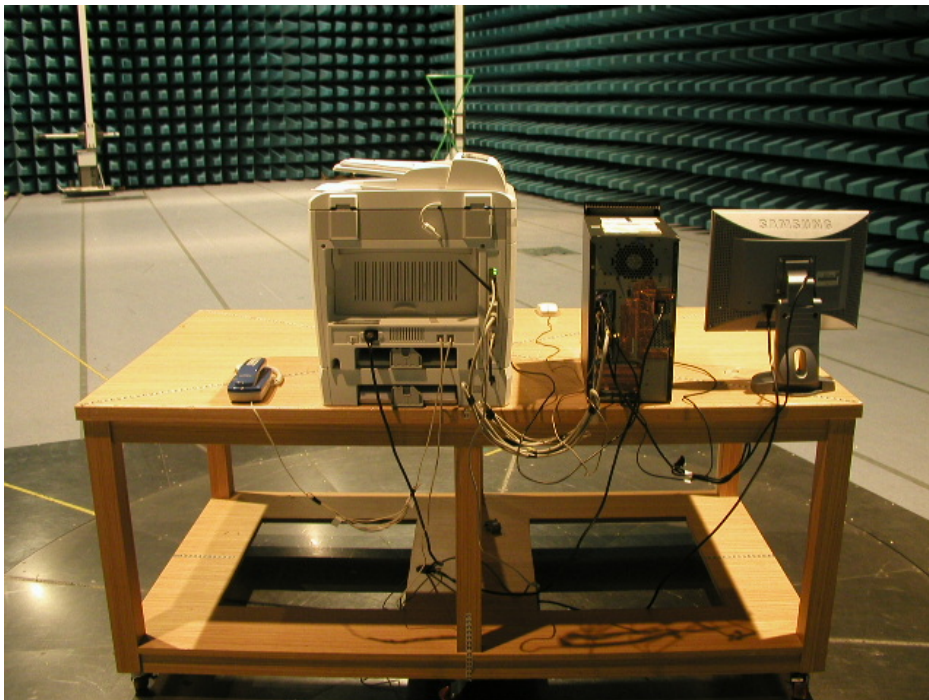
Pic. 1 Conducted Emission (Front)



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)

 USOC Jack Type: RJ11C Serial No.:	Model No.: SCX-4720F Volts: AC 110-127V Hertz: 50/60Hz Amps: 5A Manufactured:	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: i) This device may not cause harmful interference, and ii) This device must accept any interference received, including interference that may cause undesired operation. FCC ID : A3LSCX4720F (Printer) FCC ID : A3LSWL-2250U (WLAN) Complies with Part 68, FCC Rules. FCC Certification No.: This product complies with 21 CFR Chapter 1, subchapter J, COMPANY NAME: Samsung Electronics Co., Ltd. ADDRESS: 259, Gongdan-Dong, Gumi-City, Kyung-Buk, 730-030, Korea Place: M259 This Class B digital apparatus complies with Canadian ICES-003 Cet appareil numérique de la classe "B" est Conforme à la norme NMB-003 du Canada. IC:
	 LISTED 51Y7 E149091 I.T.E. HS-03	MADE IN KOREA JC68-01062A

 USOC Jack Type: RJ11C Serial No.:	Model No.: SCX-4720F Volts: AC 110-127V Hertz: 50/60Hz Amps: 5A Manufactured:	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: i) This device may not cause harmful interference, and ii) This device must accept any interference received, including interference that may cause undesired operation. FCC ID : A3LSCX4720F (Printer) FCC ID : A3LSWL-2250U (WLAN) Complies with Part 68, FCC Rules. FCC Certification No.: This product complies with 21 CFR Chapter 1, subchapter J, COMPANY NAME: Shandong Samsung Telecommunication Co., Ltd. Sanxing Road, Weihai Hi-Tech, IDZ Shandong Province, 264209, China Place: M264 This Class B digital apparatus complies with Canadian ICES-003 Cet appareil numérique de la classe "B" est Conforme à la norme NMB-003 du Canada. IC:
	 LISTED 51Y7 E149091 I.T.E. HS-03	MANUFACTURED BY SAMSUNG CHINA JC68-01321A Rev.00

Pic. 7 EUT (Label)



Pic. 8 EUT (Inside)