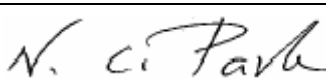
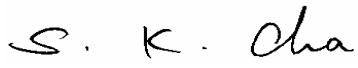


EMC Test Report

According to FCC Part 15 Subpart B

Project No.	LBE050993
Equipment under Test	
Applicant	Samsung Electronics Co., Ltd. 416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
FCC ID	A3LWT21MFF
Product Name	Laser MFP
Model Name	WT21MFF
Manufacturer	Shandong Samsung Telecommunications Co., Ltd. #264209, Samsung Road, Weihai Hi-tech IDZ Shandong Province CHINA
Date of Test	May 4, 2005
Issued Date	May 13, 2005

	Name/Position	Signature
Tested by	Kyeong Dong, Kim 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

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1. General Information

1.1 Basic Information related Product

Applicant	Samsung Electronics Co., Ltd.
Model name	WT21MFF
Applicant Address	416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
Contact Person	Kyeong Dong, Kim
Kind of product	Laser MFP
Valiant list	WT21MFC (Withoout FAX Function) Brand = Samsung SCX-4521F (Same as WT21MFF) Brand = Samsung SCX-4321 (Same as WT21MFC) Brand = Samsung WorkCentre PE220 (Same as WT21MFF) Brand = Xerox CopyCentre PE220 (Same as WT21MFC) Brand = Xerox
Manufacturer	Shandong Samsung Telecommunications Co., Ltd. #264209, Samsung Road, Weihai Hi-tech IDZ Shandong Province CHINA
New / Alternative / Permissive change Information	NEW

1.2 Detail Information related Product

Specification

Item	Specification	Remark
Power Requirement	110~127 VAC, 50/60Hz, 4.5A	
Power Consumption	Sleep Mode : 10W, Average : 350W	
Warm-Up Time	Less than 35 seconds	
LCD Screen	16 words x 2 Lines	
Toner Cartridge Life	3,000 pages(for starter 1,000 pages) at IDC 5% Coverage	
Memory	Basic 10Mb(Non expendable)	
Weight	10.1 Kg	
Dimension(WxDxH)	438 x 374 x 368 mm	
Scan Method	CIS, ADF mode	
Scan resolution	Optical 600 * 600 dpi, Enhanced 4800 * 4800 dpi	
Scan Speed	20 pages per 1 min. (A4)	
Fax Compatibility	ITU-T Group 3	
Modem Speed	33.6 Kbps	
Transmission Speed	3 seconds/page(ITU-T No. 1 chart)	
Fax Resolution	Standard : 203 * 98 dpi Fine : 203 * 196 dpi Super fine : 300 * 300 dpi	
Fax User Memory	2 MB (160 pages)	
Printing Method	Laser Beam Printing	
Printing Speed	Letter : 20 ppm A4 : 20 ppm	
Print Resolution	600 * 600 dpi (1200*600dpi)	
Interface	USB2.0 1Port, IEEE 1284 1Port	

Operating Frequency

Video clock : 18.75 MHz
CPU clock : 66 MHz
SDRAM Clock : 66 MHz
Main Clock : 10 MHz
CIS Clock(copy) : 4.166MHz
Modem Clock : 28.224MHz
OPE Micom Clock : 7.37MHz

1.3 Operating Mode and 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 is supporting the USB and IEEE1284 printing mode, Fax Tx and Rx and Copy 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, ADF Copy was reported.

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 Conducted Emission

The 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 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 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.

Frequency Band [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
0.15 to 80	EMI Receiver	Quasi-Peak	9kHz	-
		Average	9kHz	-

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 biconi-Log antenna.

Also, the EMI RECEIVER was scanned from 1000 to 1800MHz using linearly polarization Double ridge horn antennas were used. The explanation of measuring instrument setup when Respective function is used in any frequency band is as following;

Frequency Band [MHz]	Instrument	Detector	Resolution Bandwidth	Video Bandwidth
30 to 1000	EMI Receiver	Quasi-Peak	120kHz	-
Above 1000	EMI Receiver	Peak	1MHz	1MHz

1.7 Test Configuration

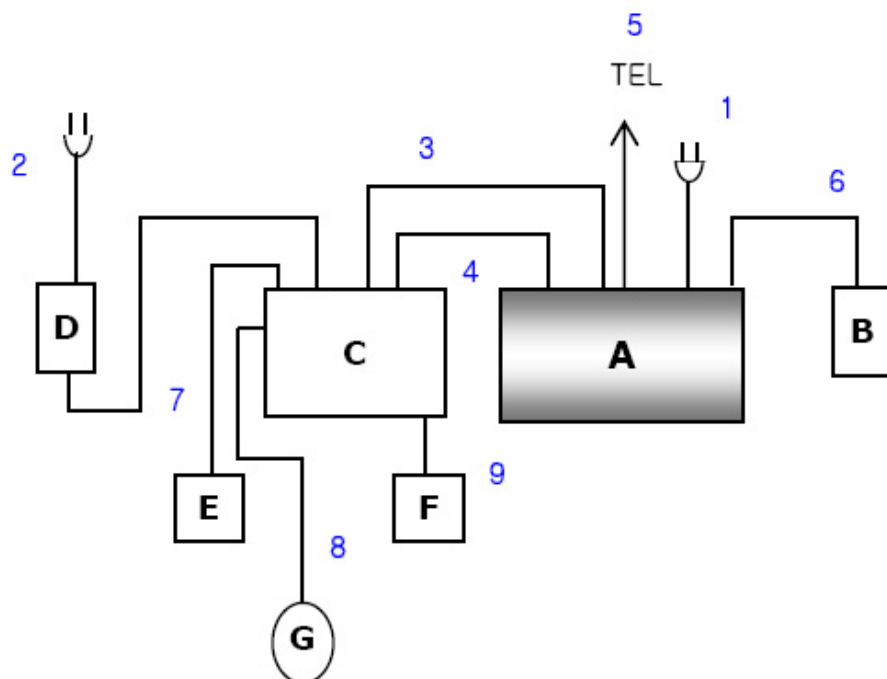
Used EUT and Peripherals

Seq	Device	Model Name	Serial #	Maker	Note
A	Laser MFP	WT21MFF	-	Samsung	E.U.T
B	Telephone	SP-F118	B2AJ403896	Samsung	-
C	Note PC	PP03L	1D166A02	DELL	DoC
D	AC Adapter	ADP-90FB	06G356	DELTA	-
E	DVD-ROM Drive	-	CN-00J105-70161 -231-A077	DELL	DoC
F	USB FDD Drive	MSFD-20U	20001111	SANYO MOTOR	DoC
G	Serial Mouse	SERIAL MOUSE	0988578	Microsoft	FCC ID : C3KMS1

Used Cable Description

	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	AC Power	1.7	N	For EUT
2	AC Power	1.8	N	For PC
3	USB	1.7	Y	-
4	Parallel	1.6	Y	-
5	TEL	2.0	N	RJ11
6	TEL	2.0	N	RJ11
7	USB	0.6	Y	-
8	Serial	1.8	Y	-
9	USB	0.6	Y	-

Block Diagram



1.8 Applied Standards

List

Product or Generic Standards	Basic Standards
FCC Part15 B	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 NAMAS Pub.NIS81)

Samsung IT EMC Test Lab.

Conducted Emission : $\pm 1.9\text{dB}$

Radiated Emission 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	Result
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	Kyeong Dong, Kim
Test Date	May 4, 2005
Climate Condition	Ambient Temperature : 24.0 °C Relative Humidity : 50%
	Atmospheric Pressure 1007mbar
Test Place	Shield 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	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: "SCX-4521F_FC_fin QP"

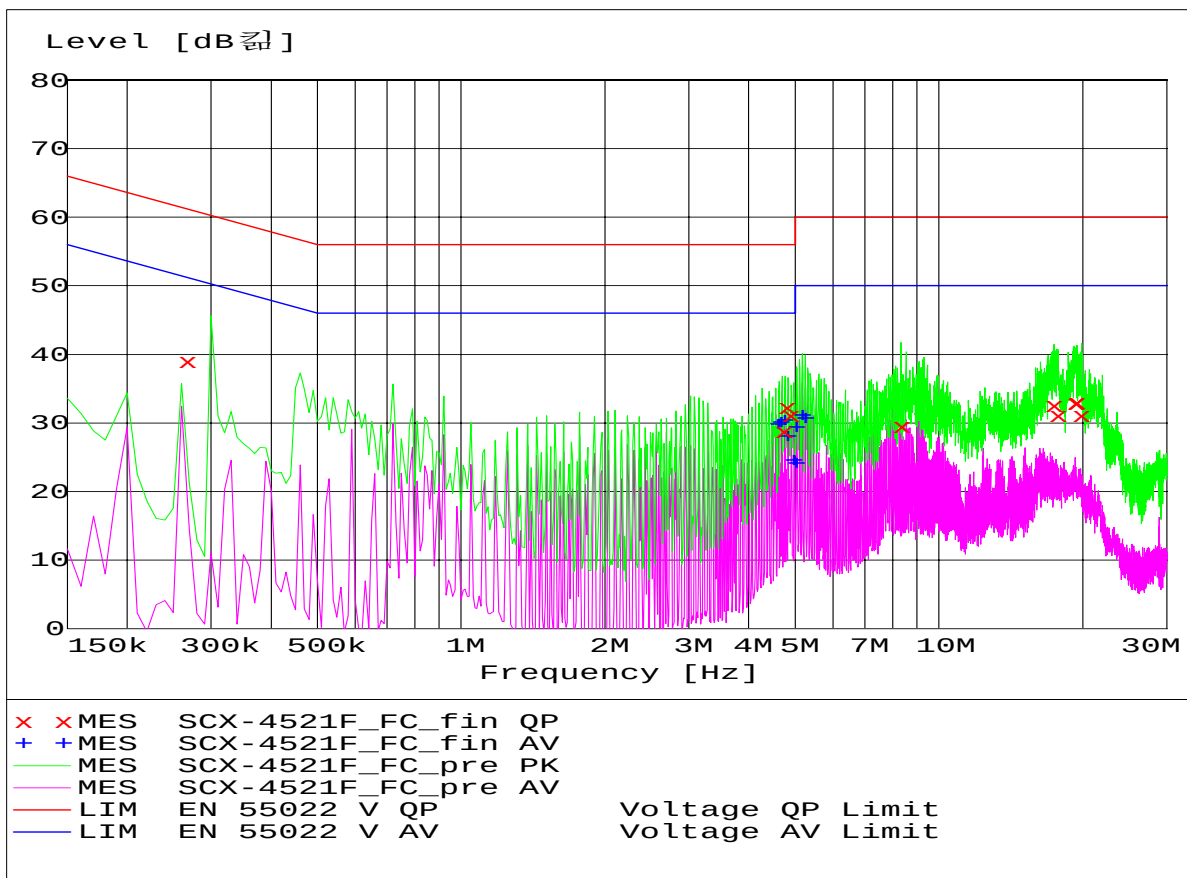
Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
0.265000	38.9	0.5	61.3	22.4	L1	GND
4.700000	28.8	0.8	56.0	27.2	L1	GND
4.775000	32.2	0.8	56.0	23.8	L1	GND
4.845000	31.1	0.8	56.0	24.9	L1	GND
8.280000	29.5	1.1	60.0	30.5	N	GND
17.285000	32.6	1.6	60.0	27.4	N	GND
17.610000	31.1	1.6	60.0	28.9	N	GND
19.175000	32.8	1.7	60.0	27.2	N	GND
19.260000	32.9	1.7	60.0	27.1	N	GND
19.705000	31.1	1.8	60.0	28.9	N	GND

1.2 Average

MEASUREMENT RESULT: "SCX-4521F_FC_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBμV	dB	dBμV	dB		
4.570000	29.8	0.8	46.0	16.2	L1	GND
4.640000	30.1	0.8	46.0	15.9	L1	GND
4.710000	30.3	0.8	46.0	15.7	L1	GND
4.780000	28.0	0.8	46.0	18.0	L1	GND
4.920000	24.5	0.8	46.0	21.5	L1	GND
4.990000	24.1	0.8	46.0	21.9	N	GND
4.995000	29.3	0.8	46.0	16.7	L1	GND
5.135000	31.1	0.9	50.0	18.9	N	GND
5.205000	30.7	0.9	50.0	19.3	N	GND

- Graph -



3.2 Radiated Emission

Test Information	
Test Engineer	Kyeong Dong, Kim
Test Date	May 4, 2005
Climate Condition	Ambient Temperature : 21.0℃ Relative Humidity : 49%
	Atmospheric Pressure 1007mbar
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 No Operation errors were detected during or after the applied test.
----------------------------	--

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.

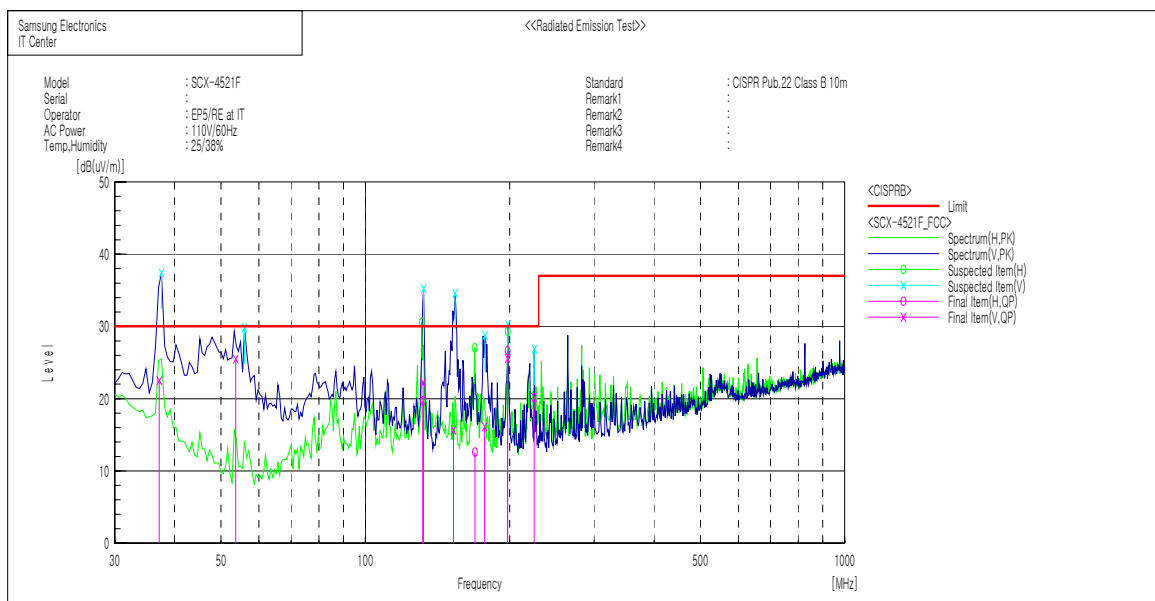
* Receiving Antenna Mode : Horizontal, Vertical

* 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	37.159	V	S	27.9	-5.4	22.5	30.0	7.5	119.0	236.0	
2	53.621	V	S	38.8	-13.3	25.5	30.0	4.5	278.0	285.0	
3	131.997	V	S	30.0	-7.8	22.2	30.0	7.8	113.0	277.0	
4	132.021	H	S	27.5	-7.8	19.7	30.0	10.3	377.0	245.0	
5	152.715	V	S	24.6	-9.0	15.6	30.0	14.4	123.0	144.0	
6	169.342	H	S	22.6	-10.0	12.6	30.0	17.4	372.0	106.0	
7	177.383	V	S	26.4	-10.3	16.1	30.0	13.9	100.0	139.0	
8	197.987	V	S	35.8	-10.2	25.6	30.0	4.4	109.0	337.0	
9	198.014	H	S	36.9	-10.2	26.7	30.0	3.3	367.0	191.0	
10	225.003	V	S	29.7	-9.5	20.2	30.0	9.8	129.0	300.0	

4. Appendix

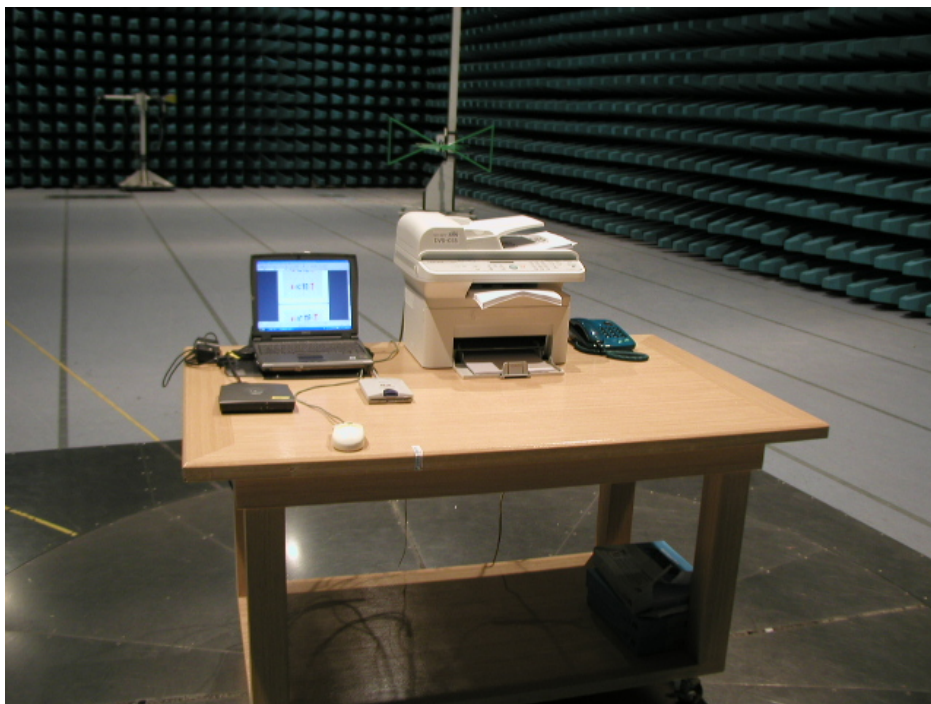
4.1 Test Photography



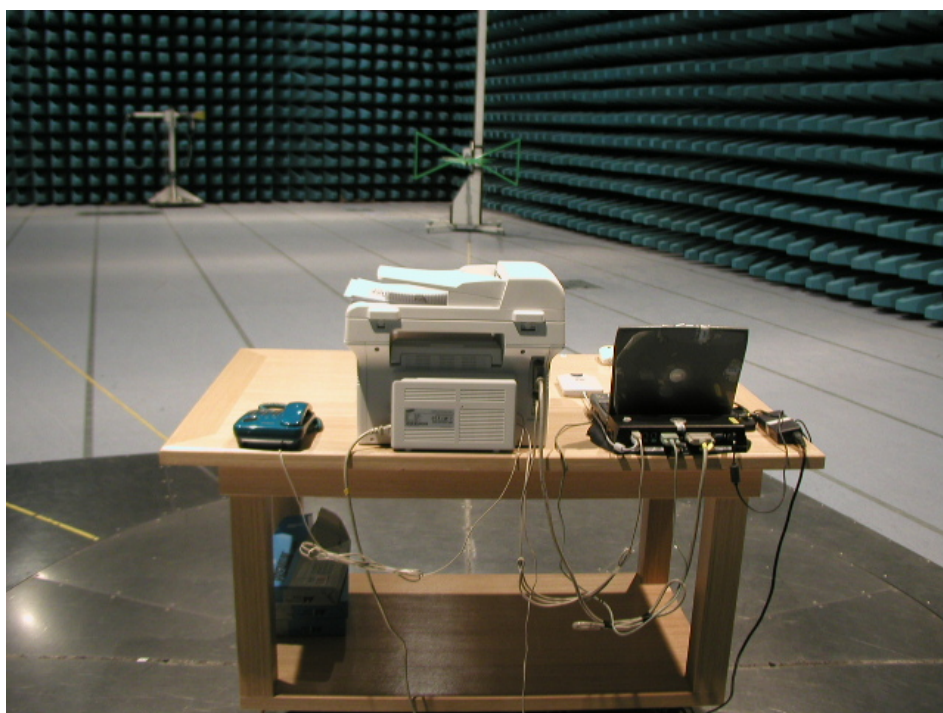
Picture 1. Conducted Emission (Front)



Picture 2. Conducted Emission (Rear)



Picture 3. Radiated Emission (Front)



Picture 4. Radiated Emission (Rear)

4.2 EUT Photography



Picture 5. EUT (Front)



Picture 6. EUT (Rear)(Label Location)

 USOC Jack Type:RJ11C Complies with Part 68, FCC Rules. FCC Certification No.:  Serial No.	Model: SCX-4521F Type No.: WT21MFF Voltz: AC 110-127V Hertz: 50/60Hz Amps: 4.5A Ringer Equivalence: 0.5B 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: A3LWT21MFF This product complies with 21 CFR Chapter 1, subchapter J. COMPANY NAME: Shandong Samsung Telecommunications Co., Ltd. ADDRESS: 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.	MADE IN CHINA REV.00

  Serial No.	Model: SCX-4321 Type No.: WT21MFC Voltz: AC 110-127V Hertz: 50/60Hz Amps: 4.5A 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: A3LWT21MFF This product complies with 21 CFR Chapter 1, subchapter J. COMPANY NAME: Shandong Samsung Telecommunications Co., Ltd. ADDRESS: 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. MADE IN CHINA REV.00
	 LISTED 51Y7 E149091 I.T.E.	

Picture 7. EUT (Label) WT21MFF, WT21MFC of Samsung

XEROX Xerox Corporation Webster, NY 14580 Made in China USOC Jack Type: RJ11C Complies with Part 68, FCC Rules. FCC Certification No.: US: This product complies with FDA performance Standards for laser products except for Deviations pursuant to laser notice No 50, Dated 26 July 2001 Place: M264 Serial No.	WorkCentre PE220 Voltz: AC 110-127V Hertz: 50/60Hz Amps: 4.5A Ringer Equivalence: 0.5B 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: A3LWT21MFF
	 LISTED 51Y7 E149091 I.T.E.	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: 
		MADE IN CHINA REV.00 (2)

XEROX Xerox Corporation Webster, NY 14580 Made in China This product complies with FDA performance Standards for laser products except for Deviations pursuant to laser notice No 50, Dated 26 July 2001 Place: M264 Serial No.	CopyCentre PE220 Voltz: AC 110-127V Hertz: 50/60Hz Amps: 4.5A 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: A3LWT21MFF
	 LISTED 51Y7 E149091 I.T.E.	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.
		
		MADE IN CHINA REV.00 (2)

Picture 8. EUT (Label) WorkCentre PE220, CopyCentre PE220 of Xerox