EMC TEST REPORT

Samsung Electronics Co., Ltd.
416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si,Gyeonggi-Do, 443-742 Korea
(Tel: 031 277 7752, Fax: 031 277 7753)
NVLAP Code : 200623-0

1. Applicant
   - Name of organization : Samsung Electronics Co., Ltd.
   - Address : 416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 443-742 Korea

2. Purpose for the report : Approval for EMC

3. Kind of product : Multi Function Printer (Model name: CLX-3160FN)

4. Date of test : 2006.06.11 ~ 2006.06.20

5. Applied standard : FCC Part 15, Subpart B

6. Report No. : LBE061722 Issue 1

7. FCC ID : A3LIR31CFF

8. Test result : Complied

   The equipment under test has found to be compliant with the applied standards.

   (Refer to the attached test result for more detail.)

Tested by	Reviewed by
Name : Seung Beom, Choi	Name : No Cheon, Park

This report is the test result about the sphere accredited by KOLAS which signed the Mutual Recognition Arrangement of International Laboratory Accreditation Cooperation.

2006.06.22

Samsung Electronics Co., Ltd.
Chief of CS Management Center

TEST RESULT

Test Report No.	:	LBE061722
Applicant / Address	:	Samsung Electronics Co., Ltd. 416 Maetan 3-Dong, Yeongtong-Gu,Suwon-Si,Gyeonggi-Do 443-742 Korea
Manufacture / Address	:	1) Samsung Electronics Co., Ltd. 259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, 730-030 Korea 2) Shandong Samsung Telecommunications Co., Ltd. 264209, Samsugn (Sanxing) Road, Weihai Hi-Tech. IDZ, Shandong Province, P.R.China
EUT	:	1. Product name : Multi Function Printer 2. Model name : CLX-3160FN 3. Brand name : Samsung, Xerox 4. Variant model : CLX-3160N Phaser 6110MFP/XN Phaser 6110MFP/SN
Test Method	:	ANSI C 63.4:2003
Test Result	:	**Complied** The equipment under test has found to be compliant with the applied standards
Test Lab.	:	CS Management Center, Samsung Electronics Co., Ltd.
Tested by	:	Seung Beom, Choi
Reviewed by	:	No Cheon, Park
Date of Issue	:	2006.06.22

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1. General information

1.1 Basic information related product

Applicant	Samsung Electronics Co., Ltd.
Model name	CLX-3160FN
Applicant address	416 Maetan 3-Dong, Yeongtong-Gu,Suwon-Si,Gyeonggi-Do 443-742 Korea
Contact person	Sang Soo, Noh
Kind of product	Printer
Valiant model	CLX-3160N Phaser 6110MFP/XN Phaser 6110MFP/SN
Manufacturer	1) Samsung Electronics Co., Ltd. 259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, 730-030 Korea 2) Shandong Samsung Telecommunications Co., Ltd. 264209, Samsugn (Sanxing) Road, Weihai Hi-Tech. IDZ, Shandong Province, P.R.China
Rated power	AC 110 V, 60 Hz
New / Alternative / Permissive change information	1. Main board change : V1.1 -> V1.3 2. SMPS board change : V0.93-> V1.0 3. LIU board change : V1.0 -> V1.1 4. Addition of new models

1.2 Detail Information related product

1.2.1 Specification

Item	Specification
Paper out capacity	Output tray : 100 sheet (face down)
Power Rating	110 ~ 127 VAC, 5A, 50/60 Hz
Power Consumption	Average : 400 W Power Save mode : Less than 17 W
Noise Level	Printing mode Black and white : Less than 49 dBA Color : Less than 48 dBA Copying mode : Less than 55 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
Display	16 characters x 2 lines
Memory	128MB
Printing method	Laser Beam Printing
Print Resolution	Up to 2400 x 600 dpi effective output
Printer Language	SPL-C
Scanning method	ADF and Flat-bed Color CCD module
Resolution	Optical : 600 x 1200 dpi (mono and color) Enhanced : 4,800 x 4,800 dpi
Copy speed	Black & White : Up to 14 cpm in A4 or Letter Color : Up to 4 cpm in A4 or Letter
Copy resolution	Scan : up to 600 x 300 dpi(text, text/photo) up to 600 x 600 dpi(photo) Print : up to 600 x 600 dpi(text, text/photo) up to 1200 x 1200 dpi(photo)
Modem speed	33.6 kbps
Transmission speed	Approx. 3 second/page
Maximum document length	Scanner glass : 11.7 inches ADF : 14 inches
Resolution	Standard : 203 x 98 dpi Fine : 203 x 196 dpi Super Fine : 300 x 300 dpi Photo : 203 x 196 dpi Color : 200 x 200 dpi

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.

This EUT has the following operating mode(s).

- Color copy mode

1.4 Equipment modifications

No equipment modification

1.5 Test procedure

1.5.1 Conducted emission

The 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 80 cm 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 30 cm to 40 cm long and were handed at a 40 cm 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	-

1.5.2 Radiated emission

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.
The 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 trun 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.

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 1 000	EMI Receiver	Quasi-Peak	120 kHz	-

1.6 Test configuration

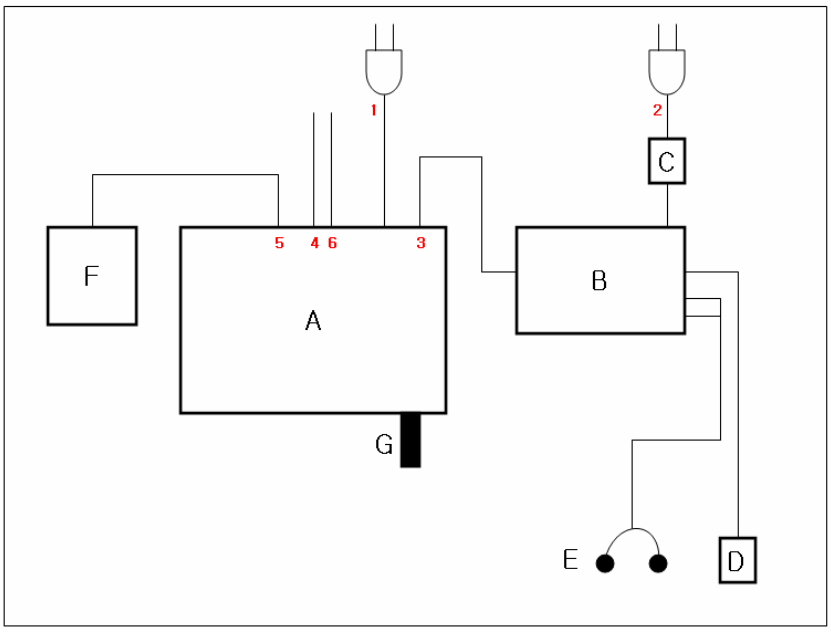
1.6.1 Used EUT and peripherals

Seq	Device	Model Name	Serial #	Maker	Note
A	Multi Function Printer	CLX-3160FN	-	Samsung, Xerox	EUT
B	Note PC	SENS X15	630B93CY300149J	Samsung	DoC
C	Adapter	API1AD02	CNBA4400162ABJ 6F5375049	Samsung	DoC
D	Mouse	M-UR69	LNA22400077	Samsung	DoC
E	Headset	-	-	Cosy	DoC
F	Phone	SP-F118R	-	Samsung	DoC
G	USB memory	PRO+ 256M	E-D900-03-1996(B)	Memorive	DoC

1.6.2 Used cable description

No	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	Power	1.8	No	EUT
2	Power	1.8	No	Note PC
3	USB	1.5	No	-
4	TEL	2.0	Yes	-
5	TEL (ext)	1.8	No	Phone
6	LAN	1.8	Yes	-

1.6.3 Block diagram



1.7 Applied Standards

Test standard	Test method
FCC Part 15, Subpart B, Class B	ANSI C 63.4:2003

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

1.8 Test Facility

1.8.1 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.

1.8.2 Accreditation and listing

1.8.3 Measurement uncertainty

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

Test item		Measurement uncertainty
Conducted emission		± 3.3 dB
Radiated emission	Horizontal	± 4.0 dB
	Vertical	± 4.4 dB

2. Summary of test results

Result : Complied

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

Section of the product standard		Applied standard	Test result
Electromagnetic Emission Test			
3.1	Conducted Emission	FCC Part 15, Subpart B	Complied
3.2	Radiated Emission	FCC Part 15, Subpart B	Complied

3. Description of individual tests

3.1 Conducted emission

3.1.1 Test information

Test engineer	Seung Beom, Choi
Test date	June 20, 2006
Climate condition	Ambient temperature : 21.5 ℃, Relative humidity : 34 % Atmospheric pressure 101.3 kPa
Test place	Shielded room # 1

3.1.2 Test equipment

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
Field strength meter	ESCI	R&S	100086	2007-03-28	12
L.I.S.N	ENV216	R&S	100116	2006-09-08	12
L.I.S.N	ENV216	R&S	100117	2006-08-18	12

EUT Test Setup

The EUT was set up as per normal use on a wooden table, 0.4 m from a vertical ground reference plane, At least 0.8 m from other conduction surfaces and 0.8 m from the LISN.

See photo.

Test Result

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

Test Data

■ Operating Mode : color copy

[Graph and Data]

Test Information

EUT Name:	CLX-3160FN
Serial Number:	
Test Description:	110V, 60Hz
Operating Conditions:	Color copy
Operator Name:	SB, Choi
Comment:	

Hardware Setup: Voltage with 2-Line-LISN - [EMI conducted]

Subrange 1

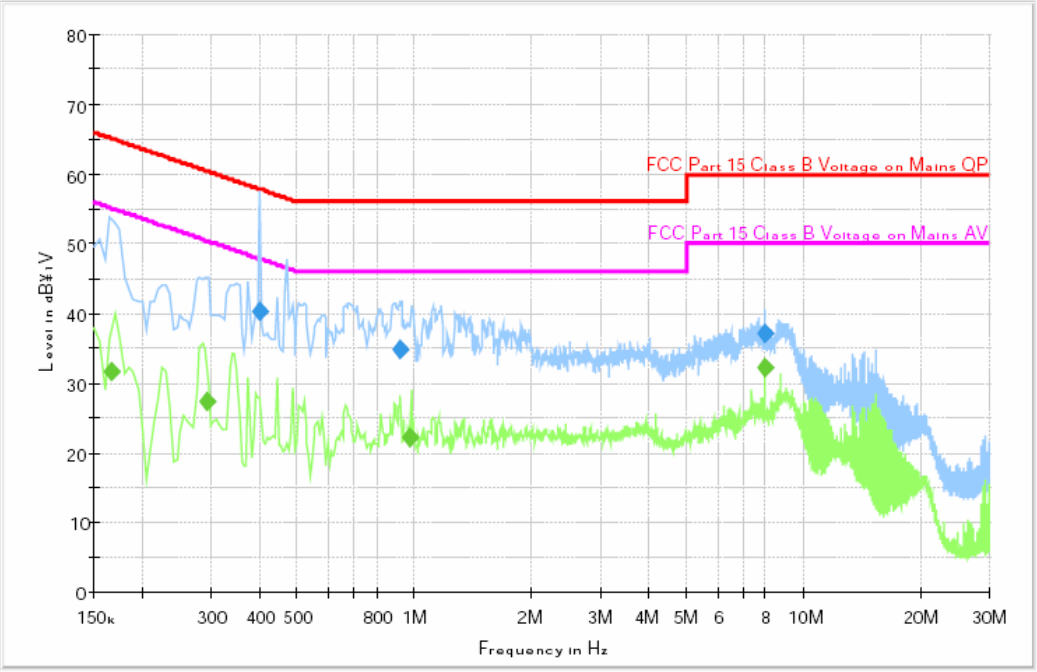
Frequency Range:	150kHz - 30MHz
Receiver:	ESCI 3
Transducer:	ENV216 / Receiver-2-Line-LISN ENV216

Scan Setup: FCC Part 15 Class B_2-Line-LISN fin [EMI conducted]

Hardware Setup:	Voltage with 2-Line-LISN
Level Unit:	dB¥¡ V

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
150kHz - 30MHz	QuasiPeak; Average	9kHz	5s	ESCI 3

FCC Part 15 Class _B with 2-Line-LISN



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.398500	40.3	5000.000	9.000	On	L1
0.922500	34.8	5000.000	9.000	On	N
7.923500	37.1	5000.000	9.000	On	N

(continuation of the "Final Measurement Detector 1" table from column 6 ...)

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.398500	9.6	17.6	57.9	
0.922500	9.6	21.2	56.0	
7.923500	9.7	22.9	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dB¥i V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line
0.166500	31.7	5000.000	9.000	On	L1
0.292500	27.3	5000.000	9.000	On	L1
0.973500	22.1	5000.000	9.000	On	L1
7.924500	32.2	5000.000	9.000	On	N

(continuation of the "Final Measurement Detector 2" table from column 6 ...)

Frequency (MHz)	Corr. (dB)	Margin (dB)	Limit (dB¥i V)	Comment
0.166500	9.6	23.4	55.1	
0.292500	9.6	23.2	50.5	
0.973500	9.6	23.9	46.0	
7.924500	9.7	17.8	50.0	

3.2 Radiated emission

3.2.1 Test information

Test engineer	Seung Beom, Choi
Test date	June 12, 2006
Climate condition	Ambient temperature : 22.5 ℃, Relative humidity : 38 % Atmospheric pressure 102.0 kPa
Test place	10 m Semi-Anechoic Chamber # 2

3.2.2 Test equipment

Equipment	Model name	Manufacturer	Serial no.	Calibration	
				Next date	Interval
EMI Test Receiver	ESI-26	R&S	100289	2007-03-13	12
Ant. Mast	MA4000	inn-co	-	N/A	N/A
Ant. Mast	MA4000	inn-co	-	N/A	N/A
Mast Controller	CO2000	inn-co	-	N/A	N/A
Amplifier	310N	SONOMA	251675	2007-03-05	12
RF selector	NS4900	TOYO	-	N/A	N/A
Bi-log Antenna	CBL6141A	SCHAFFNER	4267	2007-05-03	12

EUT Test Setup

EUT set up in semi-anechoic chamber. EUT positioned at 10 m from the antenna in the center of the table.

All ports terminated into characteristic loads.

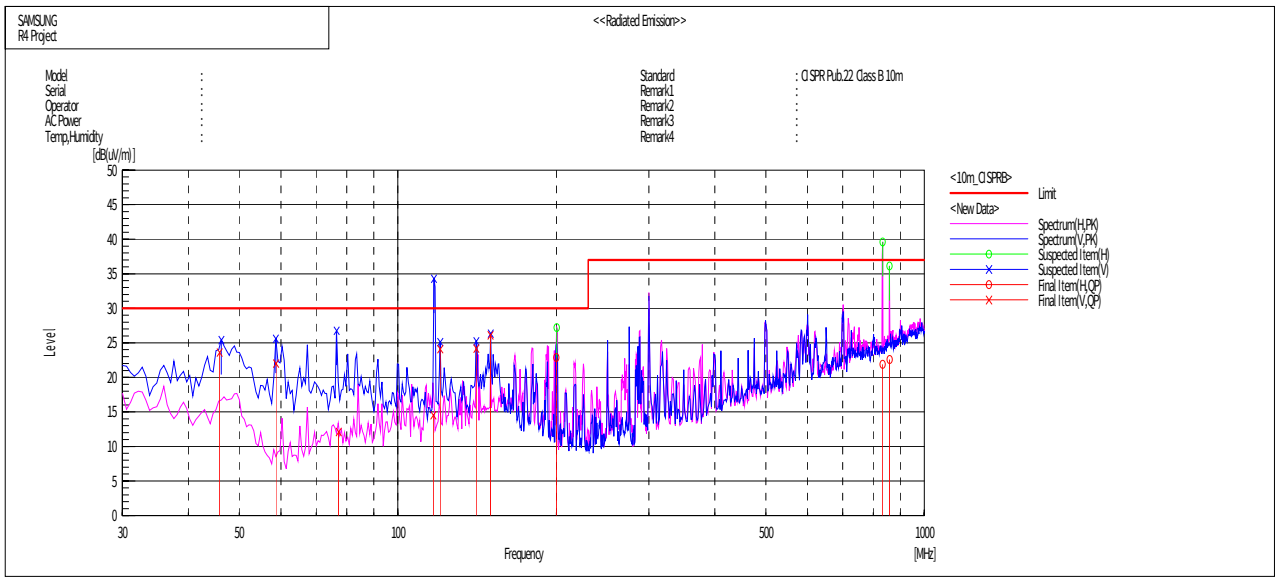
Test Result

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

Test Data (Other Frequency)

■ Operating Mode : color copy

[Graph and Data]



Final Result

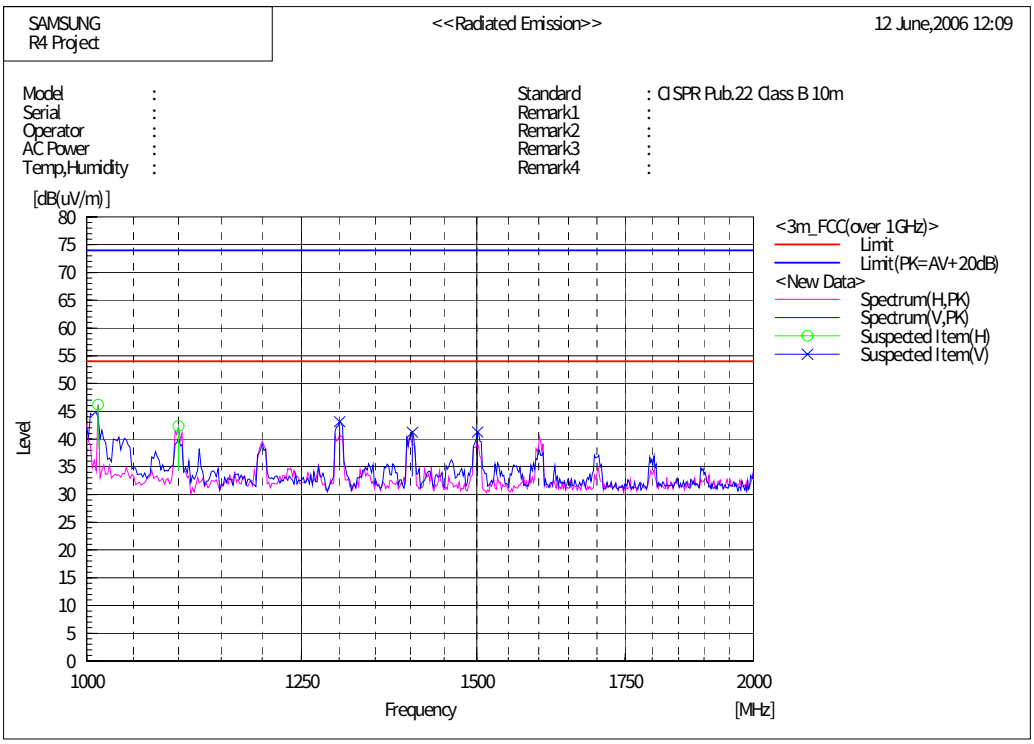
No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	116.787	V	32.2	-17.7	14.5	30.0	15.5	112.0	353.7	
2	833.185	H	23.7	-1.8	21.9	37.0	15.1	240.0	305.9	
3	859.292	H	23.3	-0.7	22.6	37.0	14.4	203.0	316.6	
4	199.995	H	40.3	-17.4	22.9	30.0	7.1	338.0	54.8	
5	77.196	V	34.0	-21.9	12.1	30.0	17.9	169.0	104.8	
6	150.009	V	42.8	-16.7	26.1	30.0	3.9	111.0	359.6	
7	58.723	V	42.4	-20.4	22.0	30.0	8.0	362.0	192.0	
8	45.894	V	38.2	-14.6	23.6	30.0	6.4	244.0	18.6	
9	140.922	V	40.9	-16.7	24.2	30.0	5.8	100.0	77.6	
10	120.361	V	41.5	-17.4	24.1	30.0	5.9	400.0	359.6	

* Receiving antenna mode : Horizontal, Vertical

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

* Result = Reading + c.f (Antenna factor + Cable loss- Amp Gain)

* Margin = Limit – Result



Final Result

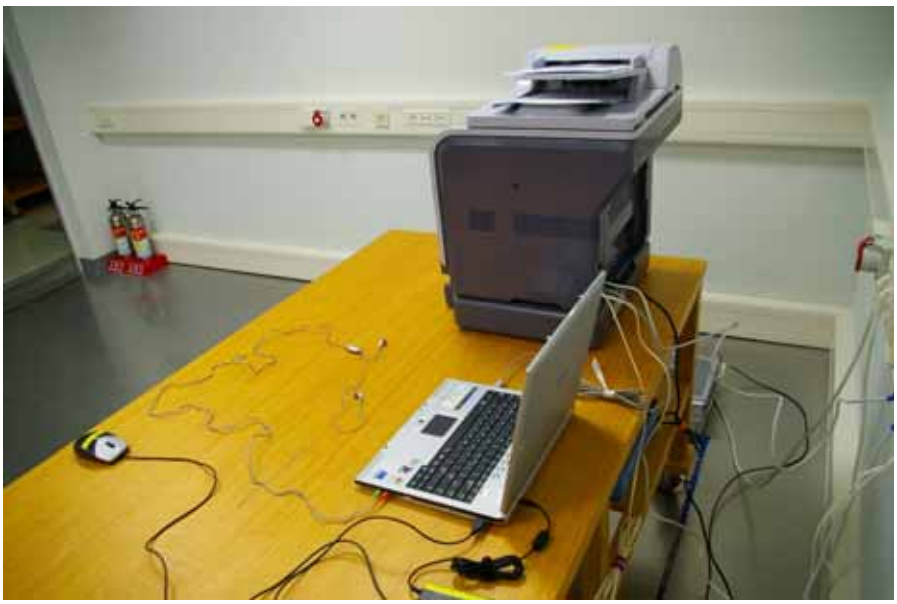
No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Limit [dB(uV/m)]	Height [cm]	Angle [deg]	Remark

* Receiving antenna mode : Horizontal, Vertical
* Test distance : 3m (RF Semi Anechoic Chamber)
* Result = Reading + c.f (Antenna factor + Cable loss- Amp Gain)
* Margin = Limit – Result

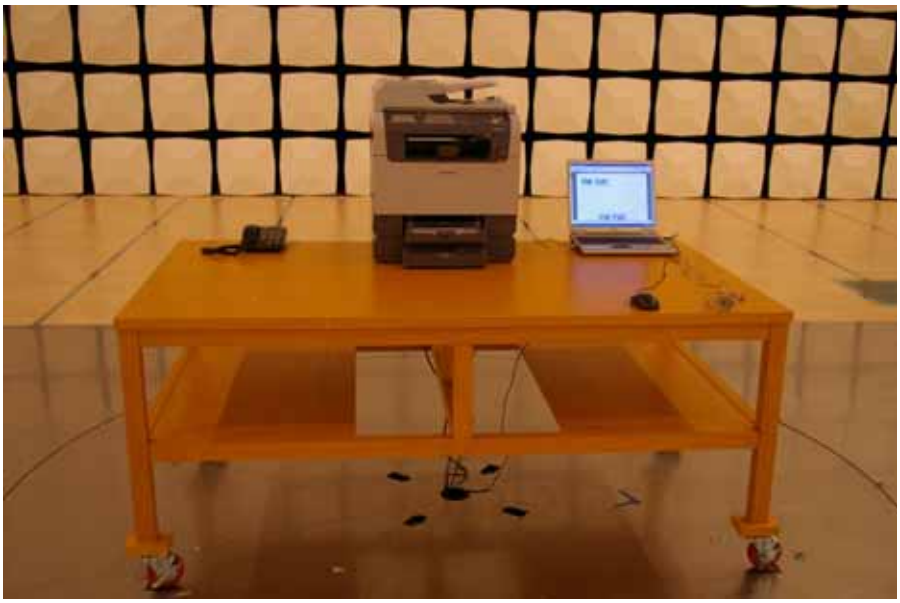
4. Appendix

4.1 Test photography

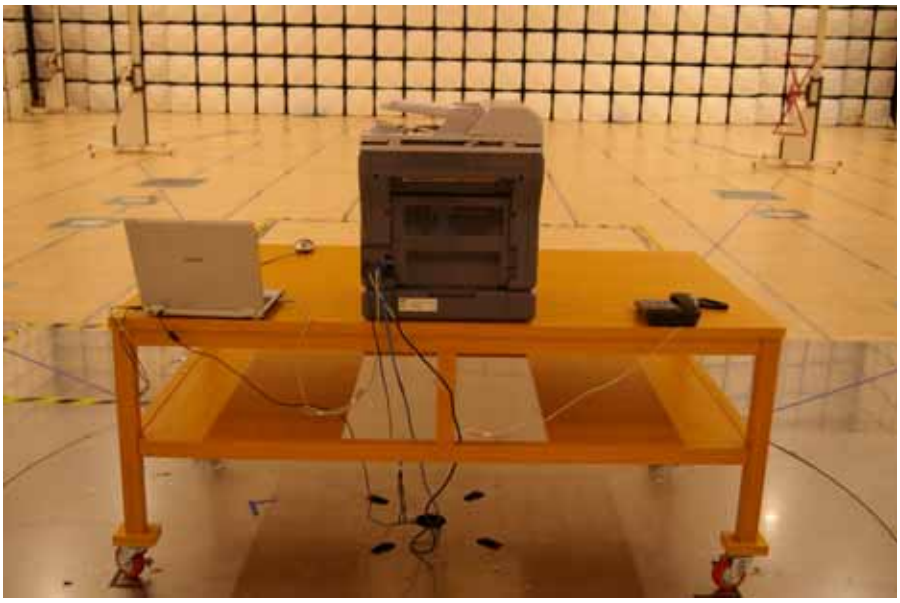
Picture 1. Conducted emission (Front)



Picture 2. Conducted emission (Rear)



Picture 3. Radiated emission (Front)



Picture 4. Radiated emission (Rear)

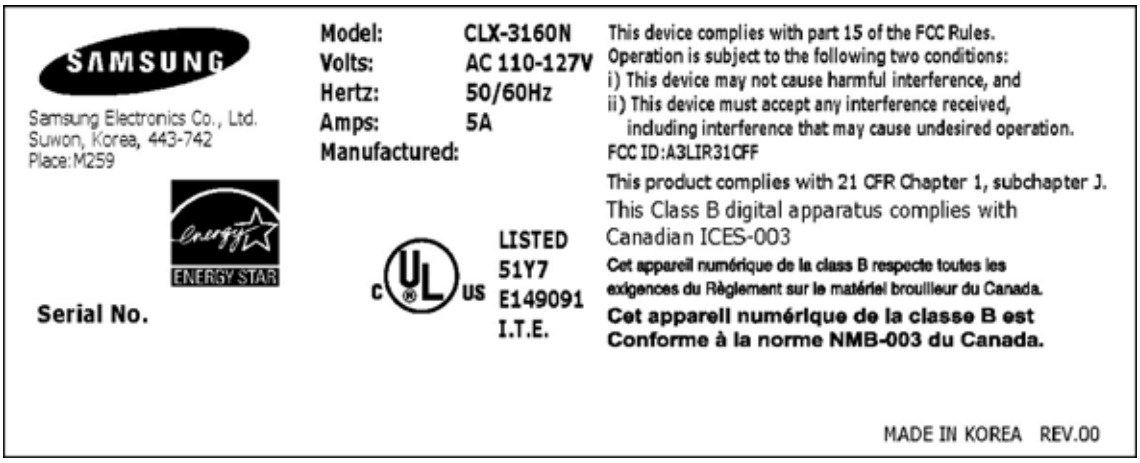
4.2 EUT photography

Picture 5. EUT (Front)

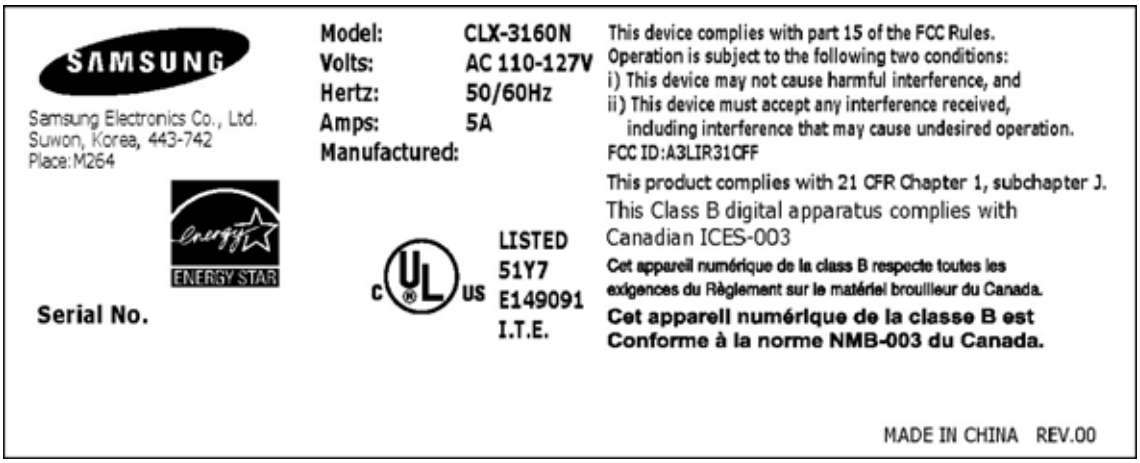
Picture 6. EUT (Rear)

Picture 7. LABEL (CLX-3160FN) - KOREA

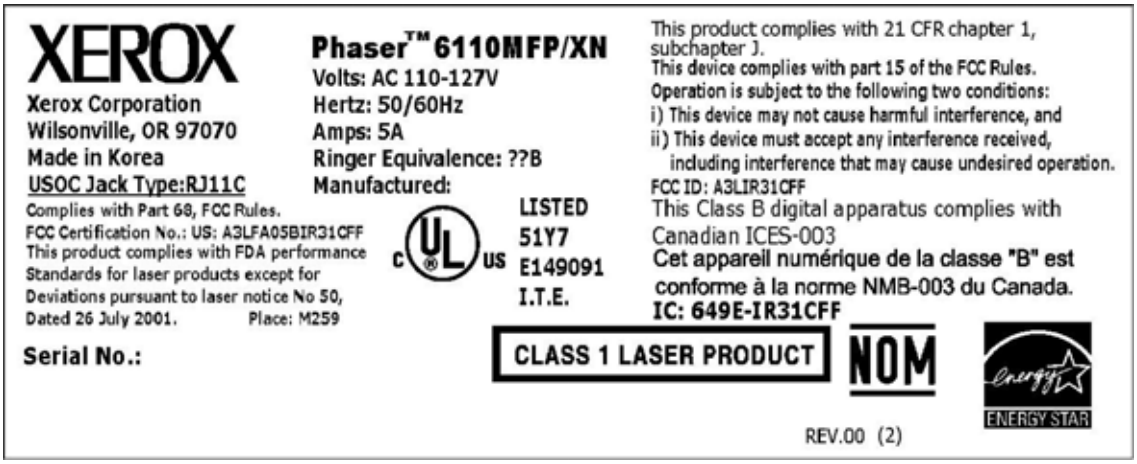
Picture 8. LABEL (CLX-3160FN) – CHINA



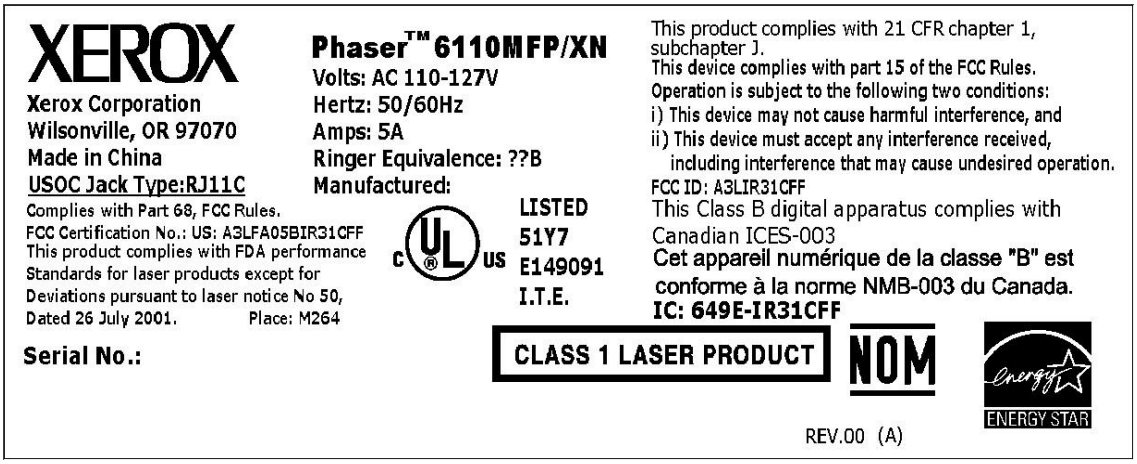
Picture 9. LABEL (CLX-3160N) – KOREA



Picture 10. LABEL (CLX-3160N) – CHINA



Picture 11. LABEL (Phaser 6110MFP/XN) – KOREA



Picture 12. LABEL (Phaser 6110MFP/XN) – CHINA

XEROX

Xerox Corporation
Wilsonville, OR 97070
Made in Korea
USOC Jack Type:RJ11C

This product complies with FDA performance Standards for laser products except for Deviations pursuant to laser notice No 50, Dated 26 July 2001. Place: M259

Phaser™ 6110MFP/SN
Volts: AC 110-127V
Hertz: 50/60Hz
Amps: 5A
Manufactured:

LISTED
51Y7
E149091
I.T.E.

This product complies with 21 CFR chapter 1, subchapter J.
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: A3LIR31CFC
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.

Serial No.:

CLASS 1 LASER PRODUCT

NOM

ENERGY STAR

REV.00 (2)

Picture 13. LABEL (Phaser 6110MFP/SN) – KOREA

XEROX

Xerox Corporation
Wilsonville, OR 97070
Made in China
USOC Jack Type:RJ11C

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

Phaser™ 6110MFP/SN
Volts: AC 110-127V
Hertz: 50/60Hz
Amps: 5A
Manufactured:

LISTED
51Y7
E149091
I.T.E.

This product complies with 21 CFR chapter 1, subchapter J.
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: A3LIR31CFC
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.

Serial No.:

CLASS 1 LASER PRODUCT

NOM

ENERGY STAR

REV.00 (A)

Picture 14. LABEL (Phaser 6110MFP/SN) – CHINA