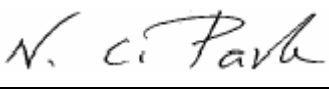
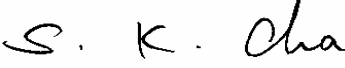


EMC Test Report

According to FCC Part 15 Subpart B

Project No.	LBE052612
Equipment under Test	
Applicant	Samsung Electronics Co., Ltd 416 Maetan 3-dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
FCC ID	A3LML3051ND
Product Name	Laser Printer
Model Name	ML-3051ND
Manufacturer	1). Samsung Electronics Co.,Ltd. 259, Gongdan-Dong, Gumi-City, Kyung-Buk, 730-030, Korea Place:M259 2). Shandong Samsung Telecommunications Co., Ltd. Sanxing Road , Weihai Hi-Tech IDZ, Shandong Province, 264209, China Place:M264
Date of Test	Nov 17, 2005 ~ Nov 21, 2005
Issued Date	Nov 29, 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

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- 4.2 EUT Photography

1. General Information

1.1 Basic Information related Product

Applicant	Samsung Electronics Co., Ltd
Model name	ML-3051ND
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	ML-3051N, ML-3050
Manufacturer	1). Samsung Electronics Co.,Ltd. 259, Gongdan-Dong, Gumi-City, Kyung-Buk, 730-030, Korea Place:M259 2). Shandong Samsung Telecommunications Co., Ltd. Sanxing Road , Weihai Hi-Tech IDZ, Shandong Province, 264209, China Place:M264
New / Alternative / Permissive change Information	New

1.2 Detail Information related Product

Specification

Item	Specification and Description
Print Speed	Black and White : Up to 28 PPM in A4(30 PPM in Letter)
Resolution	Printer: Up to 1200 x 1200 dpi(effective output)
First print out time	From Standby Mode Less than 17 seconds From ColdBoot Less than 47 seconds
Warm-up time	Less than 40 seconds
Power Rating	110 ~ 127 VAC, 6.4A, 50/60 Hz
Power Consumption	Average : 520 W Power Save mode : Less than 11 W

Noise Level	Printing mode: Less than 54 dBA Standby mode : Less than 39 dBA Warm-up: Less than 50dBA
Consumable life	Black Toner Cartridge : Approx. 4,000 A4/Letter pages at 5% Coverage
Duty cycle (Max. Monthly Volume)	Print: 100,000 pages
Weight	12.7 kg (including consumables)
Package weight	3.1 kg
External dimensions (W x D x H)	400 x 435 x 284 mm(15.7 x 17.1 x 11.2 in)
Operating Environment	Temperature : 10 ~ 32 °C (50 ~ 90 °F) Humidity : 20 ~ 80 % RH
Printer Language	PCL6, PostScript3, IBM ProPrinter, EPSON, SPL
Memory	64MB (MAX320MB)
Interface	USB 2.0
OS compatibility	Windows 95/98/Me/NT 4.0/2000/XP/2003. Various Linux OS Mac OS 10.1 ~ 10.4

Operating Frequency

Main Source : 12 MHz, Video : 12 MHz, CPU : 100 MHz,
SDRAM : 100 MHz, USB Device : 12 MHz, NIC Clock :25 MHz

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 Conducted Emission

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 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 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 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.

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

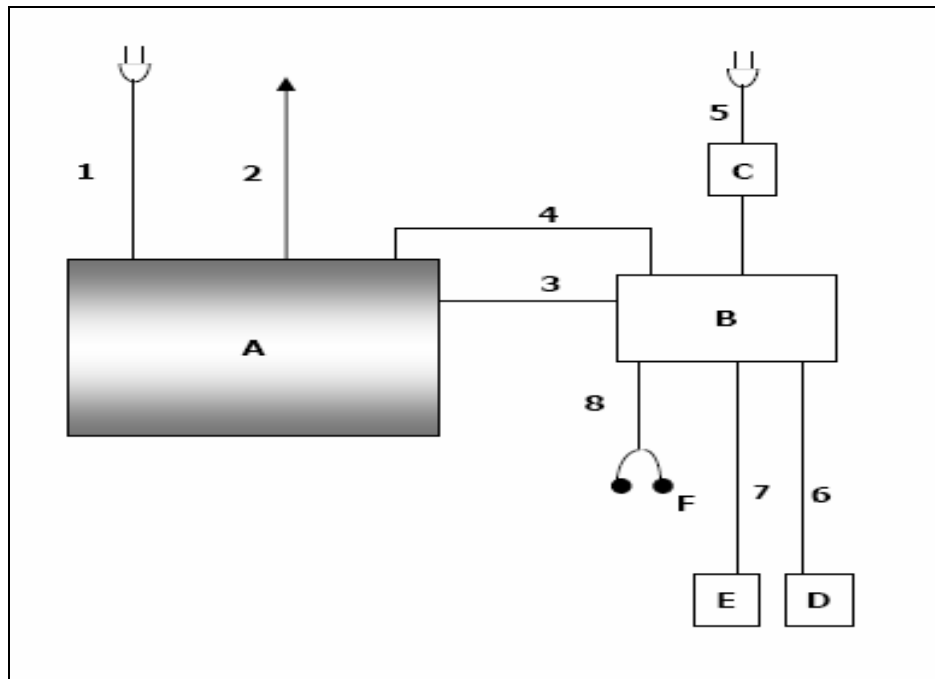
Used EUT and Peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	Remark
A	Laser Printer	ML-3051ND	-	Samsung	FCC ID: A3LML3051ND
B	Notebook PC	PP03L	26429015536	Dell	DoC
C	AC Adapter	ADP-90FD	-	Dell	-
D	USB Mouse	M-UV69a	HCA40801497	Logitech	DoC
E	Serial Mouse	SMB-400	7DEF021843	Sejin	GJJS965M3-
F	Headset	Axis-202	-	Labtec	

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	Parallel	1.8	Yes	-
5	Power	1.8	No	Notebook PC
6	USB	1.8	Yes	
7	Serial Mouse	1.5	No	

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 : ± 3.3 dB

Radiated Emission Bi-Log Antenna : ± 4.3 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	Nov 21, 2005
Climate Condition	Ambient Temperature :21.1 °C Relative Humidity : 32 %
	Atmospheric Pressure 1 022 hPa
Test Place	Shielded Room #1

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
EMI TEST RECEIVER	ESCI	R&S	100086	2006-08-23	12
LISN	NZV213	R&S	100117	2006-08-18	12
LISN	ESH3-Z5	R&S	847265/028	2006-09-08	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) + Corr(LISN Insertion loss + Cable loss)

* Margin = Limit – Level

1. - TEST DATA & GRAPH

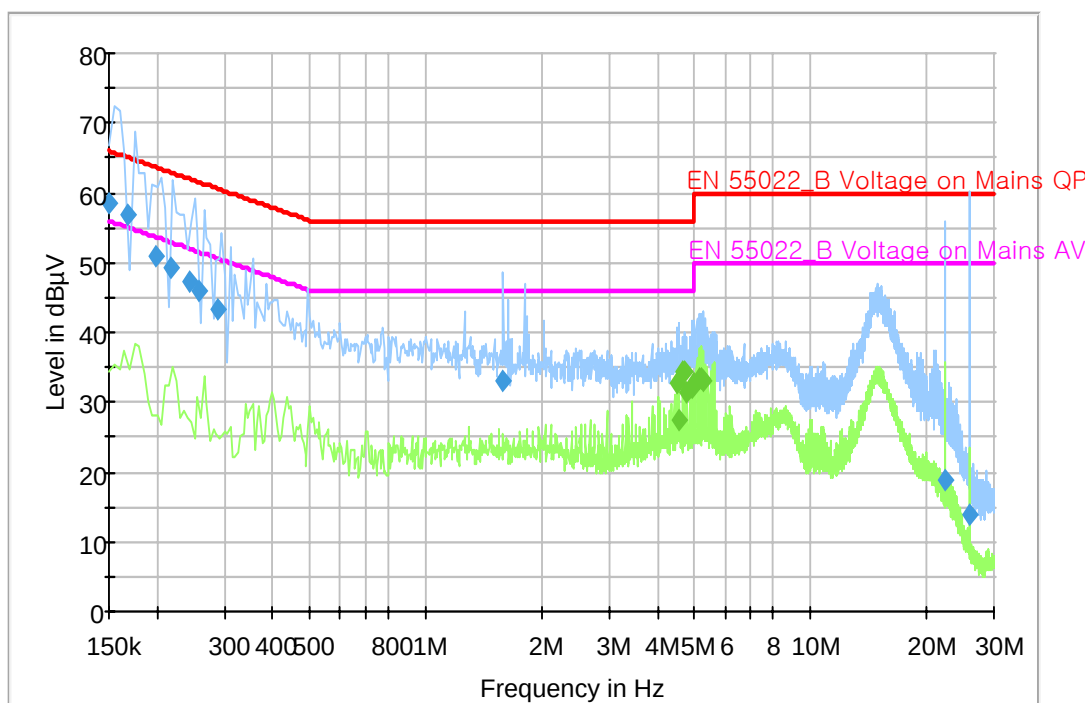
1-1. Quasi Peak Table

Frequency (MHz)	QuasiPeak (dBμV)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150 000	58.6	L1	9.6	7.4	66.0
0.167 500	56.8	L1	9.6	8.3	65.1
0.197 500	51.1	L1	9.7	12.7	63.7
0.216 500	49.4	L1	9.7	13.5	63.0
0.242 500	47.2	L1	9.7	14.8	62.0
0.257 500	45.8	N	9.7	15.7	61.5
0.287 500	43.3	N	9.7	17.3	60.6
1.582 500	33.2	N	9.7	22.8	56.0
22.321 500	18.8	L1	10.1	41.2	60.0
26.029 500	13.9	L1	10.1	46.1	60.0

1-2. Average Table

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
4.504 500	32.7	N	9.8	13.3	46.0
4.570 500	27.5	L1	9.7	18.5	46.0
4.647 500	34.4	L1	9.8	11.6	46.0
4.717 500	34.3	L1	9.8	11.7	46.0
4.784 500	31.3	L1	9.8	14.7	46.0
4.927 500	32.2	N	9.8	13.8	46.0
4.999 500	32.8	N	9.8	13.2	46.0
5.139 500	33.4	L1	9.8	16.6	50.0
5.209 500	33.5	L1	9.8	16.5	50.0
5.279 500	33.2	L1	9.8	16.8	50.0

- Graph -



3.2 Radiated Emission

Test Information	
Test Engineer	Young Hun. Cheong
Test Date	Nov 17, 2005
Climate Condition	Ambient Temperature : 25.5 °C Relative Humidity : 37 %
	Atmospheric Pressure 1 019 hPa
Test Place	10m Semi Anechoic Chamber #1

Test Equipments

Equipment	Model Name	Manufacturer	Serial No.	Calibration	
				Next Date	Interval
EMI Test Receiver	ESI-26	R&S	100289	2006-04-11	12
EMI Test Receiver	ESI-26	R&S	100291	2006-04-12	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	251674	2006-03-08	12
Amplifier	310N	SONOMA	251677	2006-03-08	12
Amplifier	NS4900	TOYO	-	N/A	N/A
Bi-log Antenna	CBL6141A	SCHAFFNER	4266	2006-05-24	12
Bi-log Antenna	CBL6141A	SCHAFFNER	4268	2006-05-24	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.

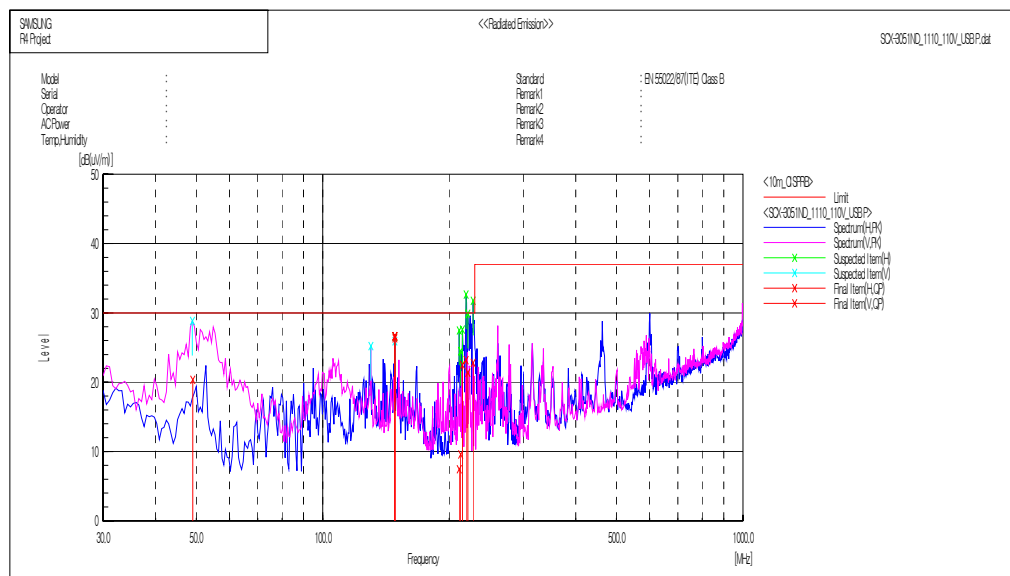
The minimum margin to the limit is as follows:

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 -



Final Result

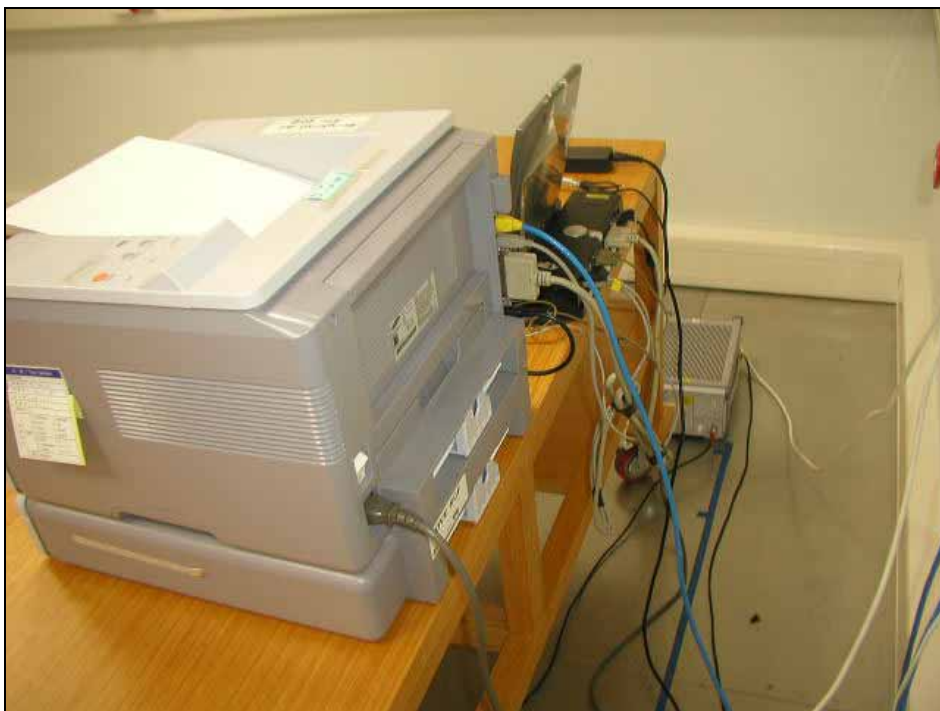
No.	Frequency (P)	Reading	c.f	Result	Limit	Margin	Height	Angle	System	Remark
	[MHz]	QP [dB(μV)]	[dB(1/m)]	QP [dB(μV/m)]	[dB(μV/m)]	QP [dB]	[cm]	[deg]		
1	148.500	H 44.3	-17.6	26.7	30.0	3.3	370.0	204.8	1	
2	49.060	V 36.4	-16.1	20.3	30.0	9.7	105.0	136.2	2	
3	148.497	H 44.2	-17.6	26.6	30.0	3.4	371.0	216.6	1	
4	148.497	V 43.7	-17.4	26.3	30.0	3.7	138.0	295.2	2	
5	211.263	H 25.8	-18.3	7.5	30.0	22.5	301.0	237.9	1	
6	212.886	H 27.1	-17.5	9.6	30.0	20.4	314.0	357.1	2	
7	215.050	H 40.2	-17.7	22.5	30.0	7.5	400.0	2.5	1	
8	219.379	H 40.5	-17.3	23.2	30.0	6.8	300.0	278.5	1	
9	221.543	H 38.7	-17.3	21.4	30.0	8.6	300.0	341.9	1	
10	228.036	H 40.2	-17.4	22.8	30.0	7.2	200.0	98.9	1	

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)

 Samsung Electronics Co., Ltd. Suwon, Korea, 443-742 Place: M259 Serial No.:	Model: ML-3051ND Volts: AC 110-127V Hertz: 50/60 Hz Amps: 6.4A Manufactured: LISTED 51Y7 E149091 I.T.E.	FCC ID : A3LML3051ND (Printer) FCC ID : A3LSWL-2460C (WLAN) 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. This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la class B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada. Canadian Certification Number(RSS-210):649E-SW2460C (WLAN) 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. This product complies with 21 CFR Chapter 1, subchapter J. MADE IN KOREA REV.00
 Samsung Electronics Co., Ltd. Suwon, Korea, 443-742 Place: M259 Serial No.:	Model: ML-3051N Volts: AC 110-127V Hertz: 50/60 Hz Amps: 6.4A Manufactured: LISTED 51Y7 E149091 I.T.E.	FCC ID : A3LML3051ND (Printer) FCC ID : A3LSWL-2460C (WLAN) 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. This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la class B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada. Canadian Certification Number(RSS-210):649E-SW2460C (WLAN) 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. This product complies with 21 CFR Chapter 1, subchapter J. MADE IN KOREA REV.00
 Samsung Electronics Co., Ltd. Suwon, Korea, 443-742 Place: M259 Serial No.:	Model: ML-3050 Volts: AC 110-127V Hertz: 50/60 Hz Amps: 6.4A Manufactured: LISTED 51Y7 E149091 I.T.E.	FCC ID : A3LML3051ND 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. This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la class B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada. 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. This product complies with 21 CFR Chapter 1, subchapter J. MADE IN KOREA REV.00

Pic. 7 EUT (Label KOREA)

 Samsung Electronics Co., Ltd. Suwon, Korea, 443-742 Place: M264 Serial No.:	Model: ML-3051ND Volts: AC 110-127V Hertz: 50/60 Hz Amps: 6.4A Manufactured: LISTED 51Y7 E149091 I.T.E.	FCC ID : A3LML3051ND (Printer) FCC ID : A3LSWL-2460C (WLAN) 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. This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada. Canadian Certification Number(RSS-210): 649E-SWL2460C (WLAN) 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. This product complies with 21 CFR Chapter 1, subchapter J. MADE IN CHINA REV.00
 Samsung Electronics Co., Ltd. Suwon, Korea, 443-742 Place: M264 Serial No.:	Model: ML-3051N Volts: AC 110-127V Hertz: 50/60 Hz Amps: 6.4A Manufactured: LISTED 51Y7 E149091 I.T.E.	FCC ID : A3LML3051ND (Printer) FCC ID : A3LSWL-2460C (WLAN) 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. This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada. Canadian Certification Number(RSS-210): 649E-SWL2460C (WLAN) 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. This product complies with 21 CFR Chapter 1, subchapter J. MADE IN CHINA REV.00
 Samsung Electronics Co., Ltd. Suwon, Korea, 443-742 Place: M264 Serial No.:	Model: ML-3050 Volts: AC 110-127V Hertz: 50/60 Hz Amps: 6.4A Manufactured: LISTED 51Y7 E149091 I.T.E.	FCC ID: A3LML3051ND 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. This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada. 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. This product complies with 21 CFR Chapter 1, subchapter J. MADE IN CHINA REV.00

Pic. 8 EUT (Label CHINA)



Pic 9. Label location