
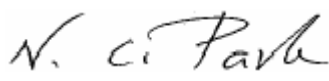
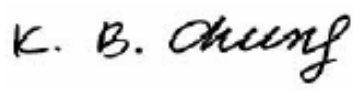


# EMC Test Report (Permissive II Change)

## According to FCC Part 15 Subpart B

|                             |   |
|-----------------------------|---|
| <b>Project No.</b>          | LBE042282   |
| <b>Equipment under Test</b> |   |
| Applicant                   | Samsung Electronics Co. Ltd;<br>416 Maetan-3 Dong, Yeoung tong-Gu, Suwon-Si, Gyeonggi-Do,<br>Korea, 442-742   |
| FCC ID                      | <b>A3LML-2550</b>   |
| Product Name                | Laser Beam Printer  |
| Model Name                  | ML-2552W  |
| Manufacturer                | 1) Samsung Electronics Co., Ltd.<br>259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, 730-030, KOREA<br>2) Samsung Electronics Slovakia s.r.o<br>Hviezdoslavova 807 SK-924 27 Galanta SLOVAKIA<br>3) Shandong Samsung Telecommunications Co., Ltd.<br>#264209, Samsung Road, Weihai Hi-Tech IDZ Shandong Province CHINA |
| <b>Date of Test</b>         | December 10, 2004~ December 13, 2004  |
| <b>Issued Date</b>          | December 15, 2004   |

|                      | <b>Name/Position</b>                  | <b>Signature</b>   |
|----------------------|---------------------------------------|--|
| <b>Tested by</b>     | Kyeong Dong, Kim<br>Test Engineer     |  |
| <b>Reviewed by</b>   | No Cheon, Park<br>Manager of EMC Lab. |  |
| <b>Authorized by</b> | Kyu Baek, Chung<br>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.**



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  | ML-2552W   |
| Applicant Address                                 | 416 Maetan3- Dong, Yeoung tong-Gu, Suwon City, Gyeonggi-Do, Korea, 443-742   |
| Contact Person                                    | Kyeong Dong, Kim   |
| Kind of product                                   | Laser Beam Printer   |
| Valiant list                                      | <p>ML-2550 (Brand : Samsung) : Basic Model</p> <p>ML-2551N (Brand : Samsung) : with NIC</p> <p>Phaser 3450B (Brand : Xerox ) : with Simplex</p> <p>Phaser 3450D (Brand : Xerox) : same as ML-2550 with Duplex</p> <p>Phaser 3450DN (Brand : Xerox) : with duplex, NIC</p> <p>Phaser 3450 (Brand : Xerox) : Multiple Model</p> <p>9025 (Brand : Xerox) : same as ML-2550 except for Model No.</p> <p>9025N (Brand : Xerox) : same as ML-2551N except for Model No.</p> <p>Phaser 3425 (Brand : Xerox) : same as Phaser 3450DN</p> |
| Manufacturer                                      | <p>1) Samsung Electronics Co., Ltd.</p> <p>259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, 730-030, KOREA</p> <p>2) Samsung Electronics Slovakia s.r.o</p> <p>Hviezdoslavova 807 SK-924 27 Galanta SLOVAKIA</p> <p>3) Shandong Samsung Telecommunications Co., Ltd.</p> <p>#264209, Samsung Road, Weihai Hi-Tech IDZ Shandong Province CHINA</p>   |
| New / Alternative / Permissive change Information | <p>This report is permissive II change report</p> <p>- Original test report no. : LBE030992</p> <p>Change Items</p> <ul style="list-style-type: none"> <li>- Main Board PCB Layout change</li> <li>- NPC(Network printer card) change</li> <li>- PCB layout of shared NPC change</li> <li>- Embedded NPC added</li> </ul> <p>Refer to the critical component change item and picture of item, Annex I</p>  |

## 1.2 Detail Information related Product

### Specification

| Item                | Specification   | Remark |
|---------------------|---|--------|
| Print Speed         | Up to 24PPM (A4), Up to 25PPM(Letter)   | -      |
| Printing Resolution | 1200 x 1200 dpi   | -      |
| Memory              | Basic 32MB, Max. 160MB  | -      |
| CPU                 | Power PC 603e compatible interface controller   | -      |
| Interface           | IEEE1284 1Port, USB2.0 1Port, Ethernet 10/100 Base<br>Tx(option for ML-2550), IEEE 802.11b Wireless LAN<br>(option for ML-2550, ML-2551N), Serial Interface(Optional) | -      |
| Power Consumption   | AC 100~127V(USA, Canada), 50/60Hz   | -      |
| External Dimensions | 386mm X 436mm X 326mm   | -      |

### Operating Frequency

Video(23.8MHz), CPU(80MHz), Main Clock/VClk/USB Clk(12MHz), N/W clock:25MHz,

Wireless LAN BW =2.4GHz

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

ML-2552W is supporting the IEEE1284,USB,LAN,Wireless 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.

#### **- Power Input**

**Voltage : AC 110V**

**Frequency : 60Hz**

### 1.4 Test System Details

None

### 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 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 bundle 30cm to 40cm long and were hanged 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 biconiLog antenna.

## 1.7 Test Configuration

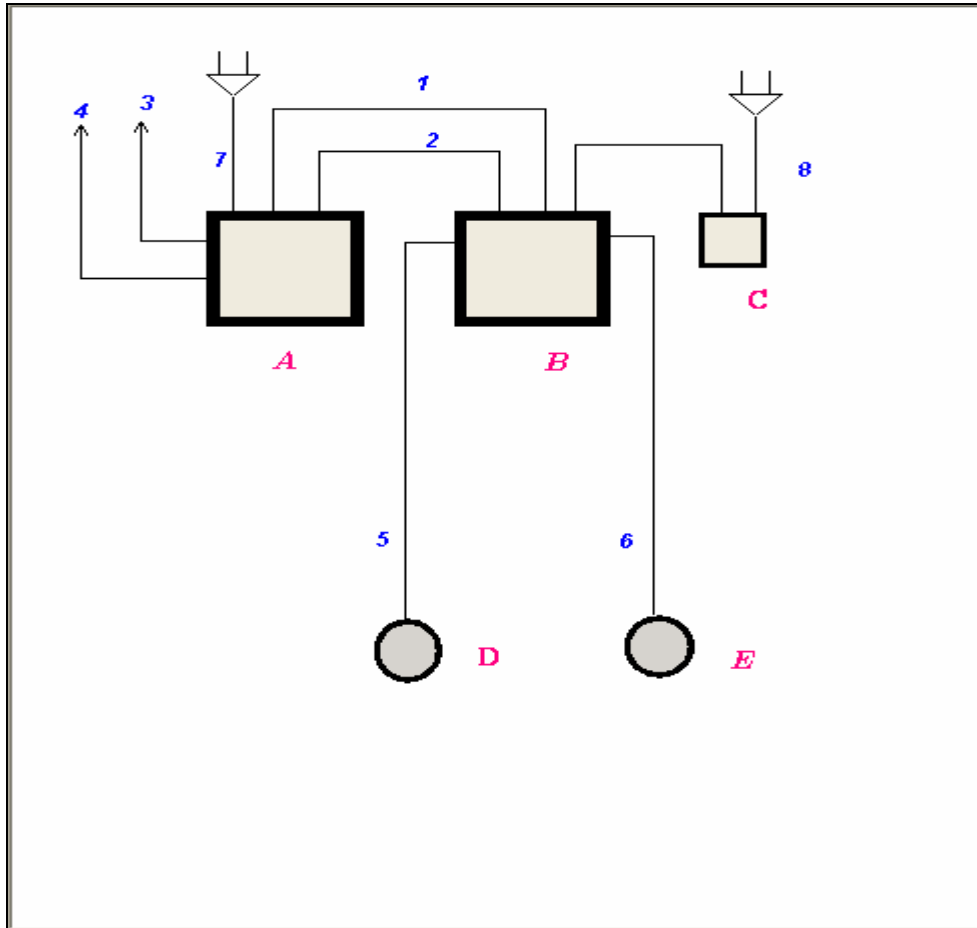
### Used EUT and Peripherals

| Seq | Device       | Model Name | Serial #                    | Maker        | Note  |
|-----|--------------|------------|-----------------------------|--------------|-------|
| A   | LBP          | ML-2552W   | -                           | Samsung      | E.U.T |
| B   | Notebook PC  | SQ20       | KRBA9602113AB<br>2WF36U0192 | Samsung      | -     |
| C   | AC Adapter   | AD-4212A   | CNBA4400148AS<br>E383AK     | Dongguan SEM | -     |
| D   | MP3 Player   | M8541      | U22370Z2MJ2                 | Apple        | -     |
| E   | Serial Mouse | OK-720     | -                           | Mass Corp.   | -     |

### Used Cable Description

|   | Connect Cable      | Length [m] | Shielded [Y/N] | Remark |
|---|--------------------|------------|----------------|--------|
| 1 | Parallel (Printer) | 1.8        | Yes            | -      |
| 2 | USB                | 1.8        | Yes            | -      |
| 3 | Wireless LAN       | -          | No             | -      |
| 4 | LAN (RJ45)         | 3.5        | No             | -      |
| 5 | 1394               | 1.2        | Yes            | -      |
| 6 | Serial             | 1.5        | No             | -      |
| 7 | Power              | 1.8        | No             | -      |
| 8 | Power              | 1.8        | 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 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 |                | : $\pm 1.9\text{dB}$ |
| 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   |                    |                  |          |
| 2.1                             | Conducted Emission | FCC Part15       | Complied |
| 2.2                             | Radiated Emission  | FCC Part15       | Complied |

### 3.1 Conducted Emission

| Test Information  |  |
|-------------------|--|
| Test Engineer     | Kyeong Dong, Kim                                   |
| Test Date         | December 13, 2004                                  |
| Climate Condition | Ambient Temperature :24 °C Relative Humidity : 37% |
|                   | Atmospheric Pressure 1028mbar                      |
| Test Place        | Shielded Room                                      |

#### Test Equipments

| Equipment         | Model Name | Manufacturer | Serial No. | Calibration |          |
|-------------------|------------|--------------|------------|-------------|----------|
|                   |            |              |            | Next Date   | Interval |
| EMI TEST RECEIVER | ESCS30     | R&S          | 830986/004 | 2005-02-12  | 12       |
| LISN              | ESH3-Z5    | R&S          | 100263     | 2005-05-25  | 12       |
| LISN              | 3810/2NM   | EMCO         | 2251       | 2005-02-07  | 12       |

| Measurement Results | <b>Passed</b><br>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

\* Result = Meter Reading(QP or AV) + Total Loss(LISN Insertion loss + Cable loss)

\* Margin = Limit – Result

## 1. USB Printing - TEST DATA & GRAPH

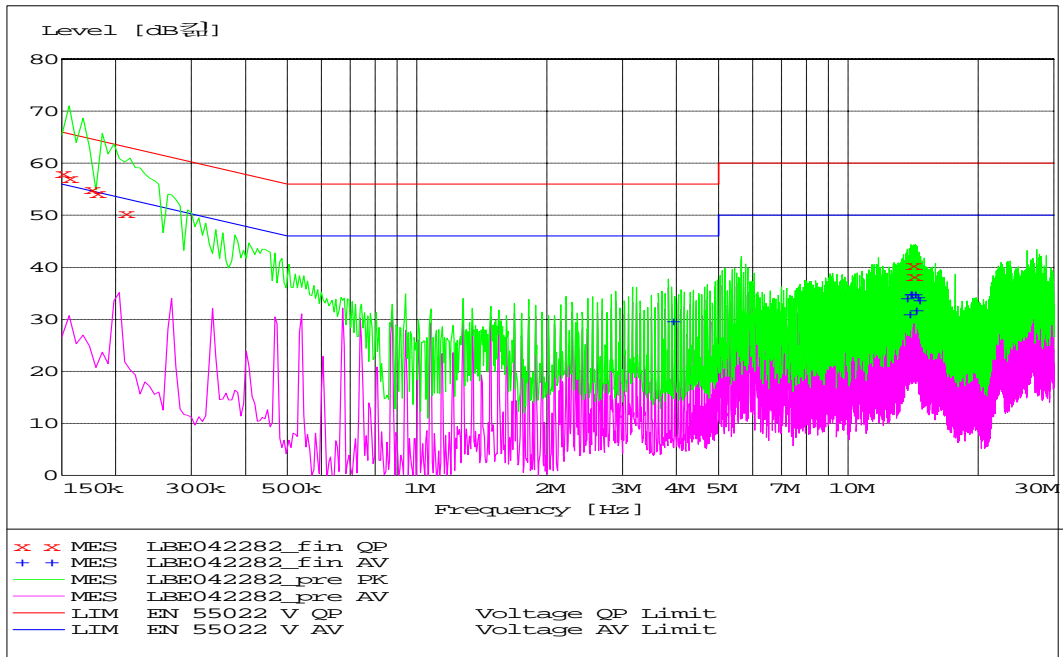
### 1. Quasi Peak Table

| Frequency | Meter Reading | Total Loss | Phase | Result | Limit  | Margin |
|-----------|---------------|------------|-------|--------|--------|--------|
| [MHz]     | [dBuV]        | [dB]       |       | [dBuV] | [dBuV] | [dB]   |
| 0.150000  | 57.4          | 0.60       | L1    | 58.0   | 66.0   | 8.0    |
| 0.155000  | 56.5          | 0.60       | L1    | 57.1   | 65.7   | 8.6    |
| 0.175000  | 54.3          | 0.60       | N     | 54.9   | 64.7   | 9.8    |
| 0.180000  | 53.7          | 0.60       | N     | 54.3   | 64.5   | 10.2   |
| 0.210000  | 49.9          | 0.60       | L1    | 50.5   | 63.2   | 12.7   |
| 14.055000 | 38.9          | 1.50       | L1    | 40.4   | 60.0   | 19.6   |
| 14.125000 | 36.8          | 1.50       | L1    | 38.3   | 60.0   | 21.7   |

### 2. Average Table

| Frequency | Meter Reading | Total Loss | Phase | Result | Limit  | Margin |
|-----------|---------------|------------|-------|--------|--------|--------|
| [MHz]     | [dBuV]        | [dB]       |       | [dBuV] | [dBuV] | [dB]   |
| 3.900000  | 28.9          | 0.80       | N     | 29.7   | 46.0   | 16.3   |
| 13.585000 | 32.5          | 1.50       | N     | 34.0   | 50.0   | 16.0   |
| 13.790000 | 29.4          | 1.50       | L1    | 30.9   | 50.0   | 19.1   |
| 13.855000 | 33.3          | 1.50       | L1    | 34.8   | 50.0   | 15.2   |
| 13.920000 | 33.3          | 1.50       | N     | 34.8   | 50.0   | 15.2   |
| 14.190000 | 33.3          | 1.50       | L1    | 34.8   | 50.0   | 15.2   |
| 14.275000 | 30.2          | 1.50       | L1    | 31.7   | 50.0   | 18.3   |
| 14.390000 | 32.8          | 1.50       | L1    | 34.3   | 50.0   | 15.7   |
| 14.525000 | 32.1          | 1.60       | L1    | 33.7   | 50.0   | 16.3   |

- Graph -



### 3.2 Radiated Emission

| Test Information  |   |
|-------------------|---|
| Test Engineer     | Kyeong Dong, Kim                                    |
| Test Date         | December 10, 2004                                   |
| Climate Condition | Ambient Temperature : 24.5℃ Relative Humidity : 40% |
|                   | Atmospheric Pressure 1019mbar                       |
| Test Place        | 10m RF Semi Anechoic Chamber                        |

#### Test Equipments

| Equipment     | Model Name | Manufacturer | Serial No.    | Calibration |          |
|---------------|------------|--------------|---------------|-------------|----------|
|               |            |              |               | Next Date   | Interval |
| 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    | 1054          | 2005-02-12  | 12       |
| BILOG Antenna | CBL6112B   | Schaffner    | 2805          | 2005-02-23  | 12       |
| Test Receiver | ESI26      | R&S          | 100010        | 2005-03-16  | 12       |

|                            |   |
|----------------------------|---|
| <b>Measurement Results</b> | <b>Passed</b><br>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

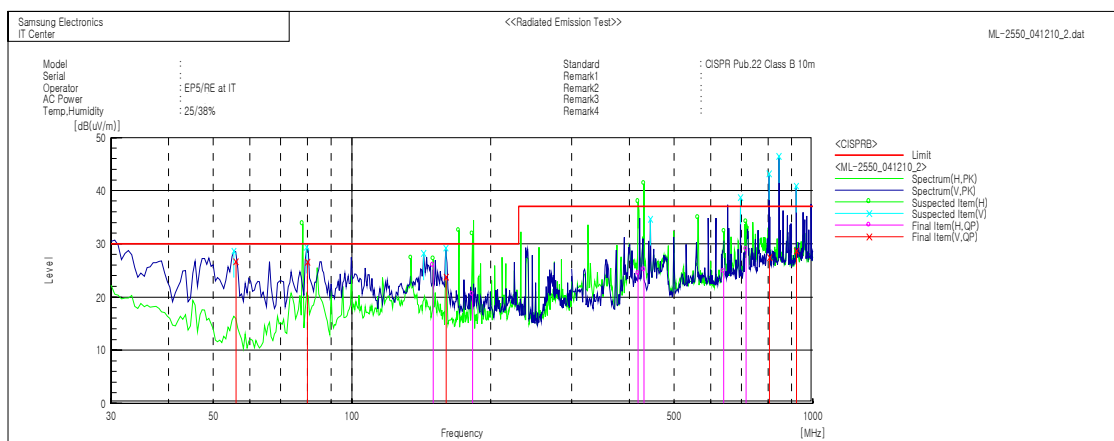
The minimum margin to the limit is as follows:

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 – Amplifier Gain)
- \* Margin = Limit – Result

## 1. USB Printing- Graph -

Samsung Electronics Co., Ltd  
IT Center



### 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   | 56.018          | V   | 40.8                | -14.2         | 26.6                 | 30.0             | 3.4            | 138.0       | 166.0       |        |
| 2   | 80.069          | V   | 39.5                | -13.0         | 26.5                 | 30.0             | 3.5            | 142.0       | 131.0       |        |
| 3   | 150.031         | H   | 34.4                | -8.5          | 25.9                 | 30.0             | 4.1            | 390.0       | 54.0        |        |
| 4   | 160.182         | V   | 32.9                | -9.2          | 23.7                 | 30.0             | 6.3            | 113.0       | 136.0       |        |
| 5   | 182.585         | H   | 30.7                | -10.2         | 20.5                 | 30.0             | 9.5            | 200.0       | 157.0       |        |
| 6   | 417.836         | H   | 26.0                | -1.6          | 24.4                 | 37.0             | 12.6           | 100.0       | 350.0       |        |
| 7   | 430.461         | H   | 26.3                | -1.2          | 25.1                 | 37.0             | 11.9           | 200.0       | 238.0       |        |
| 8   | 640.159         | H   | 21.7                | 3.1           | 24.8                 | 37.0             | 12.2           | 319.0       | 256.0       |        |
| 9   | 716.935         | H   | 25.4                | 3.5           | 28.9                 | 37.0             | 8.1            | 120.0       | 209.0       |        |
| 10  | 806.055         | V   | 22.6                | 4.8           | 27.4                 | 37.0             | 9.6            | 171.0       | 287.0       |        |
| 11  | 921.899         | V   | 22.6                | 6.0           | 28.6                 | 37.0             | 8.4            | 130.0       | 95.0        |        |

## 4. Appendix

### 4.1 Test Photography



Pic. 1 Conducted Emission (Front)

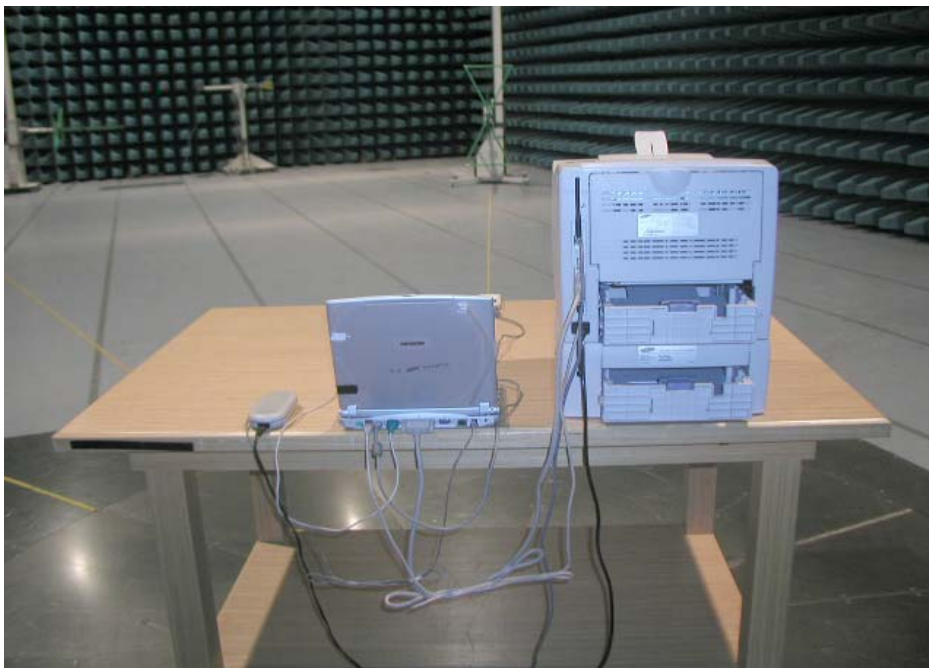


Pic. 2 Conducted Emission (Rear)





Pic. 3 Radiated Emission (Front)

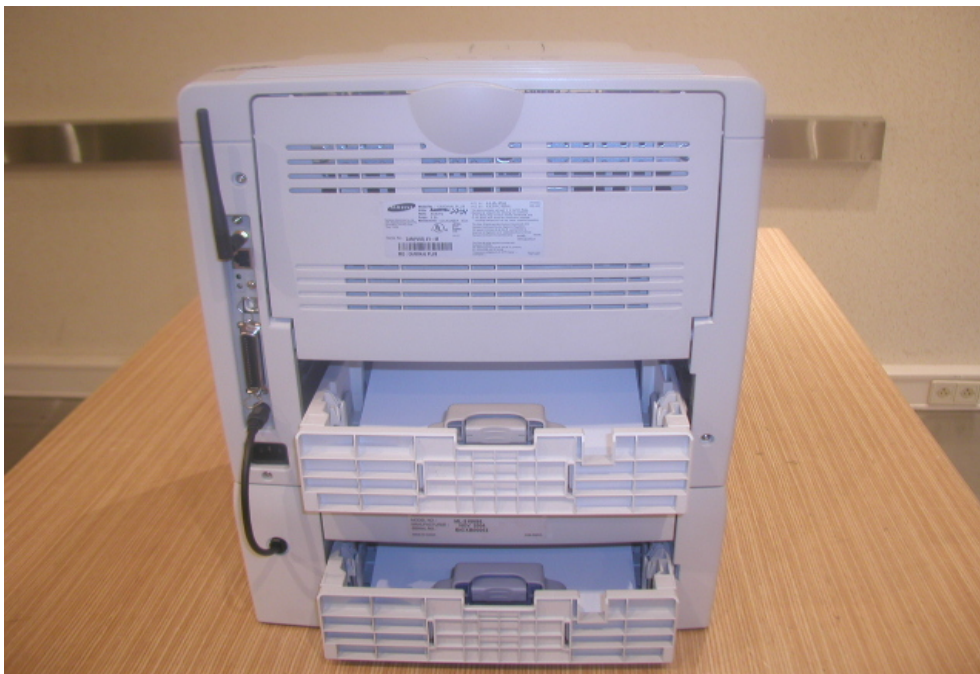


Pic. 4 Radiated Emission (Rear)

## 4.2 EUT Photography





Pic. 5 EUT (Front)



Pic. 6 EUT (Rear)



Pic. 7 EUT (Internal)

|  |   |   |
|--|---|---|
| <br>Samsung Electronics Co., Ltd.<br>259, Gongdan-Dong, Gumi-City,<br>Kyung-Buk, 730-030, Korea<br>Place : M259 | <b>Model No. : ML-2552W</b><br><b>Volts : AC100-127V</b><br><b>Hertz : 50/60Hz</b><br><b>Amps: 5.0A</b><br><b>Manufactured APRIL 2003</b> | <b>FCC ID : A3LML-2550</b> (Printer)<br><b>FCC ID : A3LSWL-2250U</b> (WLAN)<br>This device complies with part 15 of the FCC Rules.<br>Operation is subject to the following two conditions:<br>i) This device may not cause harmful interference, and<br>ii) This device must accept any interference received,<br>including interference that may cause undesired operation.   |
|  |  LISTED<br>51Y7<br>E149091<br>I.T.E.<br>"SYP-01"       | This Class B digital apparatus meets all requirements of the<br>Canadian interference-Causing Equipment Regulations.<br>Cet appareil numérique de la class B respecte toutes les<br>exigences du Règlement sur le matériel brouilleur du Canada.<br>Canadian Certification Number(RSS-210) : <b>649E-</b> (WLAN)<br><b>SWL2250U</b><br>This Class B digital apparatus complies with<br>Canadian ICES-003.<br>Cet appareil numérique de la class B est conforme<br>a la norme NMB-003 du Canada.<br>This product complies with 21 CFR Chapter 1 ,<br>subchapter J. |

Serial No.:

MADE IN KOREA  
JC88-01065A

Pic. 8 Label Rating

## Annex I

### A.1 Critical component change information

- Before

| Model Code         | Type            | Note                  |
|--------------------|-----------------|-----------------------|
| NET2270            | 16BIT,64P,30MHZ | IC-USC(U5)            |
| FS781BZB           | SOP,8P,150MIL,  | IC-CLOCK GEN(U33)     |
| CY25814SC          | SOIC,8P,150MIL  | IC-CLOCK GEN(U15,U16) |
| Crystal Oscillator | 30MHz,50ppm,    | CRYSTAL-UNIT(OSC1)    |
| Crystal Oscillator | 5.97MHz,50ppm,  | CRYSTAL-UNIT(OSC2)    |
| Crystal Oscillator | 12.5MHZ,50ppm   | CRYSTAL-UNIT(OSC3)    |
| Crystal Oscillator | 20MHZ,20PPM     | CRYSTAL-UNIT(OSC4)    |

- After

| Model Code          | Type                      | Note                   |
|---------------------|---------------------------|------------------------|
| SPGPV3              | ML-2550_VE,496PIN, ,PBGA  | IC-ASIC(U10)           |
| ISP1582BS           | 56P,12MHZ,                | IC-USC(U13)            |
| A3977SLP            | TSSOP,28P,9.6X4.5X1.2MM,- | IC-Motor Driver(U7)    |
| CY25811             | SOIC,8P,150MIL            | IC Clock gen.(U8, U11) |
| Crystall Oscillator | 12MHz, 50ppm              | Crystal-Unit(OSC1)     |
| Crystall Oscillator | 12MHz, 50ppm              | Crystal-Unit(OSC2)     |
| Crystall Oscillator | 12MHz, 50ppm              | Crystal-Unit(OSC3)     |



## A.2 Picture Information

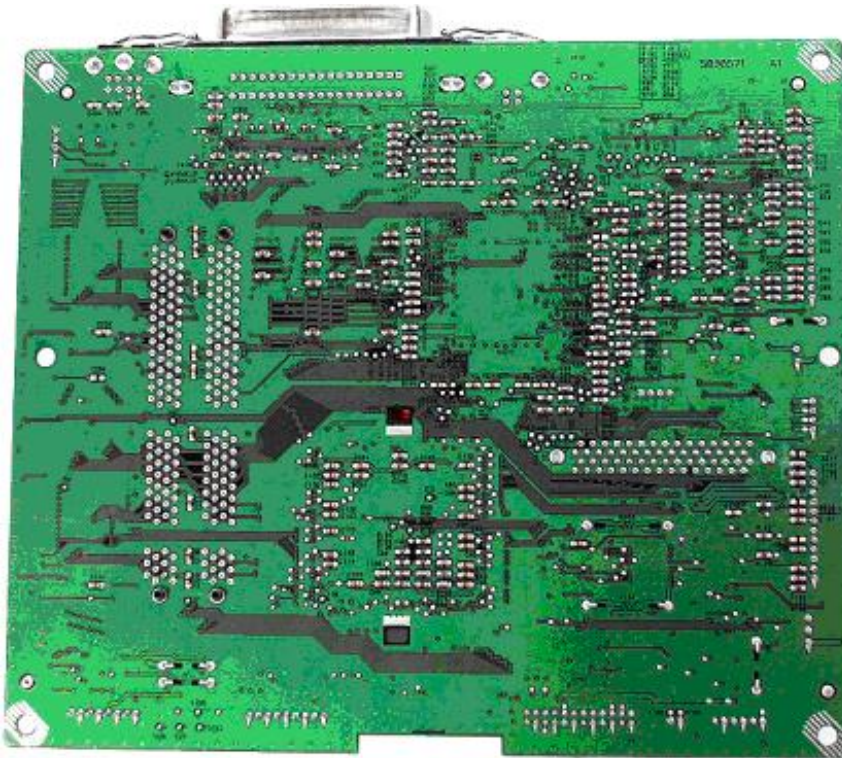


Mainboard Front (Before)

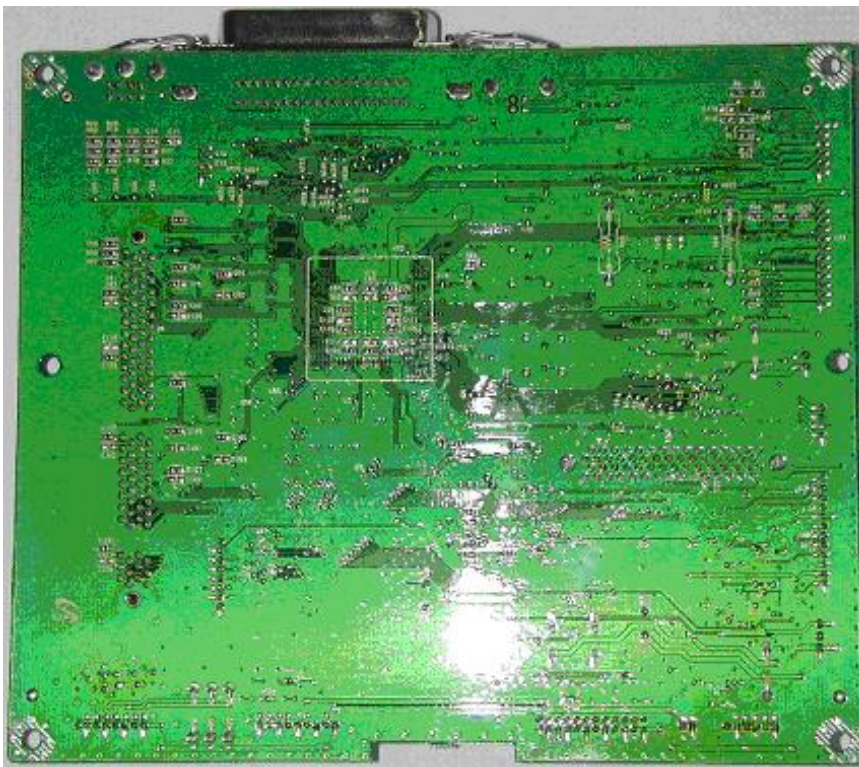


Mainboard Front (After)





Mainboard Rear (Before)



Mainboard Rear (After)



Shared NPC Front (Before)



Shared NPC Front (After)





Shared NPC Rear (Before)



Shared NPC Rear (After)





Additional embedded NPC Front



Additional embedded NPC Rear