
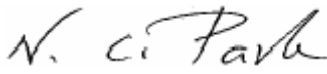
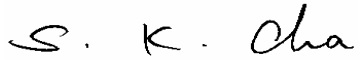


# EMC Test Report

## According to FCC Part 15 Subpart B

<b>Project No.</b>	LBE052397
<b>Equipment under Test</b>	
Applicant	Samsung Electronics Co., Ltd. 416 Maetan 3-Dong, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, Korea, 443-742
FCC ID	<b>A3LLASERMFP1600N</b>
Product Name	Laser MFP
Model Name	Dell Laser MFP 1600n
Manufacturer	1) Samsung Electronics Co., Ltd. 259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, 730-030, KOREA 2) Shandong Samsung Telecommunications Co., Ltd. #264209, Samsung Road, Weihai Hi-tech IDZ Shandong Province CHINA
<b>Date of Test</b>	Oct 4, 2005 ~ Oct 8, 2005
<b>Issued Date</b>	Oct 10, 2005

	<b>Name/Position</b>	<b>Signature</b>
<b>Tested by</b>	Kyeong Dong, Kim Test Engineer	
<b>Reviewed by</b>	No Cheon, Park Manager of EMC Lab.	
<b>Authorized by</b>	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

## **Table of Contents**

### **1. General Information**

- 1.1 Basic Information related Product
- 1.2 Detail Information related Product
- 1.3 Operating mode and condition
- 1.4 Test System Details
- 1.5 Equipment Modifications
- 1.6 Test Procedure
- 1.7 Test Configuration
- 1.8 Applied Standard
- 1.9 Test Facility

### **2. Summary of Test Results**

### **3. Description of individual tests**

- 3.1 Conducted Emission
- 3.2 Radiated Emission

### **4. Appendix**

- 4.1 Test Photography
- 4.2 EUT Photography
- 4.3 Test Pattern

### **Annex A. Changing information of EUT**

# 1. General Information

## 1.1 Basic Information related Product

Applicant	Samsung Electronics Co., Ltd.
Model name	Dell Laser MFP 1600n
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	-
Manufacturer	1) Samsung Electronics Co., Ltd. 259, Gongdan-Dong, Gumi-City, Gyeongsangbuk-Do, 730-030, KOREA 2) Shandong Samsung Telecommunications Co., Ltd. #264209, Samsung Road, Weihai Hi-tech IDZ Shandong Province CHINA
New / Alternative / Permissive change Information	This report is permissive II change report. Change Items - CPU(Chorusm) Revision (JBIG Input Module Change)

## 1.2 Detail Information related Product

Specification

Item	Specification	Remark
Power Requirement	110~127 VAC, 50/60Hz, 5.0A	-
Power Consumption	Sleep Mode : 20W, Average : 350W	-
Warm-Up Time	Less than 42 seconds	-
LCD Screen	16 words x 2 Lines	-
Toner Cartridge Life	5,000 pages(for starter 3,000 pages) at IDC 5% Coverage	-
Weight	15.6 Kg	-
Dimension	17.7" x 16.7" x 18" (450 x 423 x 456 mm)	-
Scan Method	CIS, ADF mode	-
Scan resolution	Optical 600 * 600 dpi, Enhanced 4800 * 4800 dpi	-
Scan Speed	16 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 : 22 ppm A4 : 20 ppm	-
Print Resolution	600 * 600 dpi (1200*600dpi)	-
Interface	USB2.0 1Port, Ethernet 10/100 Base Tx	-

Operating Frequency

System Clock (80MHz), Main Clock (12MHz), V Clock (12MHz), USB Clock (30MHz),  
VDO Frequency (19.5MHz), Modem Clock (28.224MHz), CCD Clock (8.0MHz)  
Network Clock (25MHz)

### 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 port. Where applicable, peripherals were attached to the I/O cables.

This EUT is supporting the USB, Network printing, Fax Tx, 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, USB printing mode was reported.

**- Power Input**

**Voltage : AC 115V**

**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

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

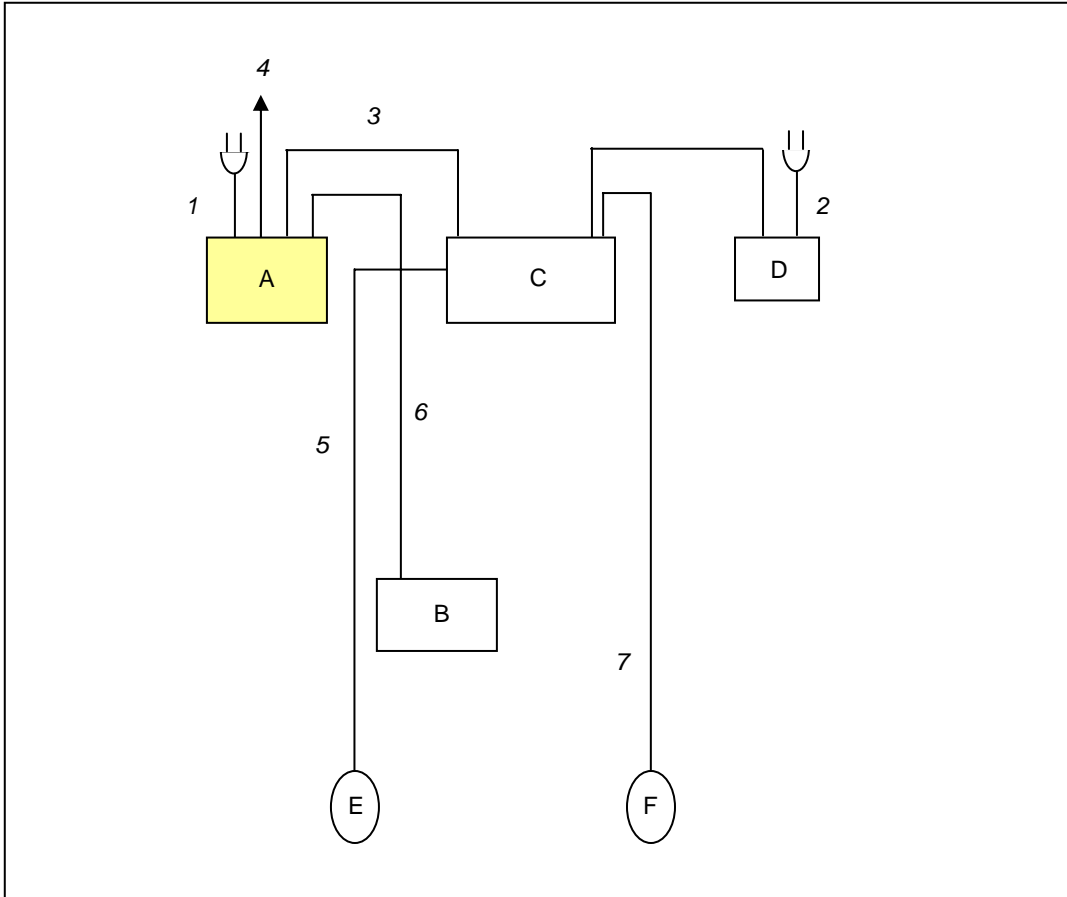
### Used EUT and Peripherals

Seq	Device	Model Name	Serial #	Maker	FCC ID/DoC
A	Laser MFP	Dell Laser MFP 1600n	-	Samsung	A3LLASERMF P1600N
B	Telephone	SP-F118	B2DFB31118	Samsung	-
C	Note PC	PP03L	1D166A02	DELL	DoC
D	AC Adapter	ADP-90FB	06G356	DELTA	For Note PC
E	Serial Mouse	Serial Mouse	0988577	Microsoft	C3KMS1
F	USB Mouse	M-UR69	LNA24917779	Logitech	DoC

### Used Cable Description

	Connect Cable	Length [m]	Shielded [Y/N]	Remark
1	AC Power	1.8	N	For EUT
2	AC Power	1.8	N	For Note PC
3	USB Cable	1.8	Y	-
4	Ethernet Cable	3.5	N	RJ45
5	Serial Mouse Cable	1.8	N	-
6	Telephone Cable	3.0	N	RJ11
7	USB Mouse Cable	1.8	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 CISPR 16-4 and Lab. 34)

**Samsung IT EMC Test Lab.**

**Conducted Emission** : ±3.1dB

**Radiated Emission** Bi-Log Antenna : ±7.3dB

## 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	Oct 08, 2005
Climate Condition	Ambient Temperature : 22.5 °C Relative Humidity : 55%
	Atmospheric Pressure 1016mbar
Test Place	Shielded 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	3810/2NM	EMCO	2251	2006-02-01	12
LISN	ESH3-Z5	R&S	100263	2006-06-06	12

<b>Measurement Results</b>	<p><b>Passed</b></p> <p>The Measured emissions of the EUT have found to be below the specified limits.</p>
----------------------------	--

## 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: "Dell 1600n\_fin QP"**

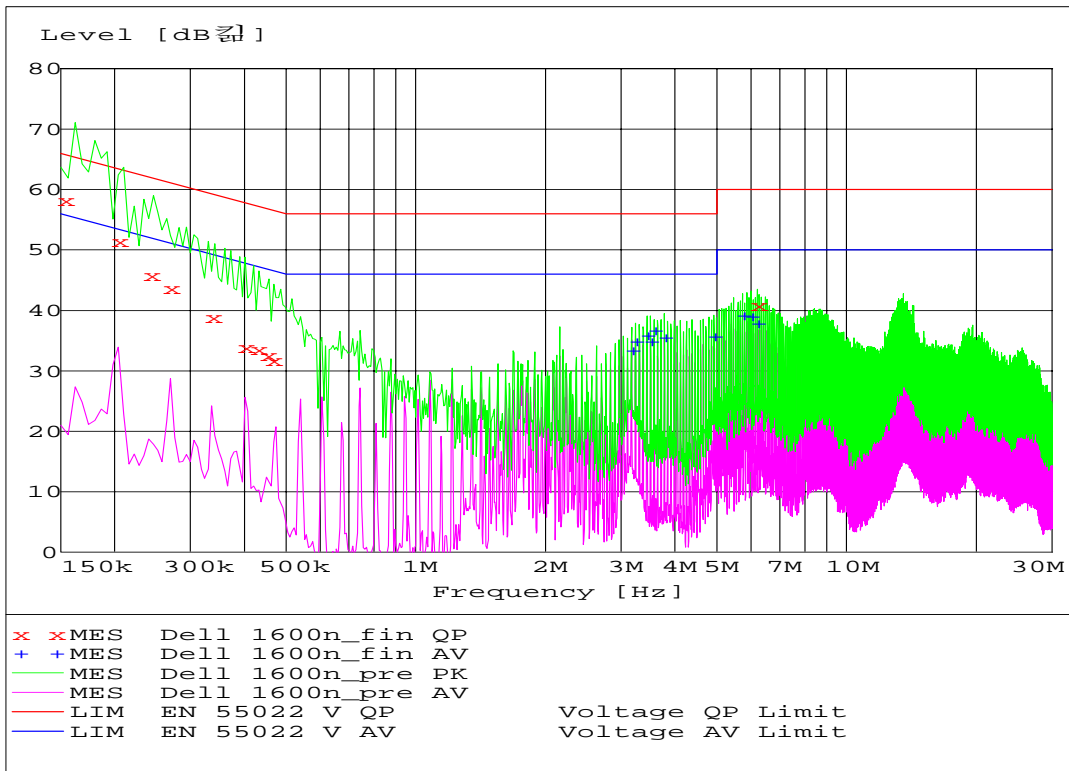
Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dB $\mu$ V	dB	dB $\mu$ V	dB		
0.153	58.2	0.2	65.8	7.7	L1	GND
0.204	51.4	0.1	63.4	12.1	N	GND
0.242	45.7	0.1	62.0	16.4	N	GND
0.269	43.7	0.1	61.1	17.4	L1	GND
0.337	38.8	0.1	59.3	20.5	N	GND
0.401	33.9	0.2	57.8	23.9	N	GND
0.429	33.6	0.2	57.3	23.6	L1	GND
0.452	32.5	0.2	56.8	24.3	N	GND
0.464	31.8	0.2	56.6	24.9	N	GND
6.208	40.8	0.4	60.0	19.2	L1	GND

**1.2 Average**

**MEASUREMENT RESULT: "Dell 1600n\_fin AV"**

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Line	PE
3.171	33.4	0.2	46.0	12.6	N	GND
3.239	34.8	0.2	46.0	11.2	L1	GND
3.440	35.9	0.2	46.0	10.1	L1	GND
3.508	34.8	0.2	46.0	11.2	N	GND
3.576	36.7	0.2	46.0	9.3	L1	GND
3.778	35.5	0.3	46.0	10.5	L1	GND
4.924	35.7	0.2	46.0	10.3	L1	GND
5.734	39.2	0.3	50.0	10.8	L1	GND
6.005	39.1	0.4	50.0	10.9	L1	GND
6.205	37.9	0.4	50.0	12.1	L1	GND

**- Graph -**



### 3.2 Radiated Emission

Test Information	
Test Engineer	Kyeong Dong, Kim
Test Date	Oct 4, 2005
Climate Condition	Ambient Temperature : 20.9℃ Relative Humidity : 53%
	Atmospheric Pressure 1015mbar
Test Place	10m 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	2006-02-07	12
BILOG Antenna	CBL6112B	Schaffner	2804	2005-11-09	12
Test Receiver	ESI26	R&S	100010	2006-09-22	12

<b>Measurement Results</b>	<p><b>Passed</b></p> <p>The measured emissions of the EUT have found to be below the specified limits.</p>
----------------------------	--

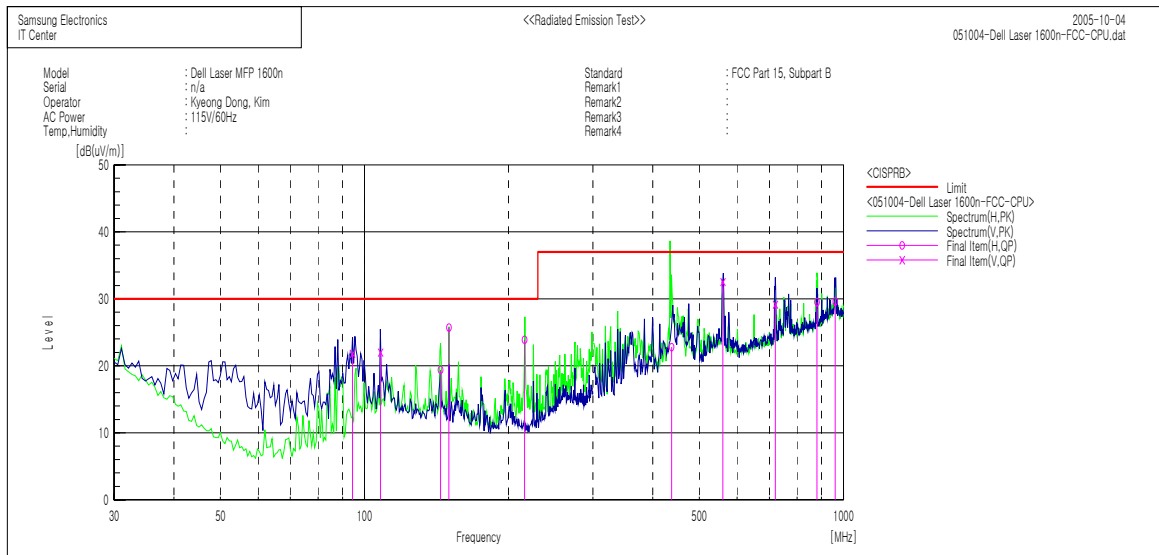
**Test Data & Graph**

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. The minimum margin to the limit is as follows:

All other emissions 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 (P)	Reading QP	c.f	Result QP	Limit	Margin QP	Height	Angle	Remark
	[MHz]	[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	94.397	V 32.1	-10.3	21.8	30.0	8.2	131.0	120.0	
2	107.983	V 30.3	-8.3	22.0	30.0	8.0	115.0	156.0	
3	144.068	H 27.9	-8.5	19.4	30.0	10.6	392.0	346.0	
4	150.020	H 34.6	-8.9	25.7	30.0	4.3	400.0	322.0	
5	215.919	H 33.7	-9.8	23.9	30.0	6.1	342.0	175.0	
6	437.692	H 23.8	-1.0	22.8	37.0	14.2	174.0	3.0	
7	560.270	V 29.4	3.1	32.5	37.0	4.5	261.0	129.0	
8	720.765	V 25.1	4.0	29.1	37.0	7.9	198.0	117.0	
9	880.460	H 23.4	6.1	29.5	37.0	7.5	245.0	243.0	
10	960.925	H 22.2	7.4	29.6	37.0	7.4	390.0	75.0	

## 4. Appendix

### 4.1 Test Photography



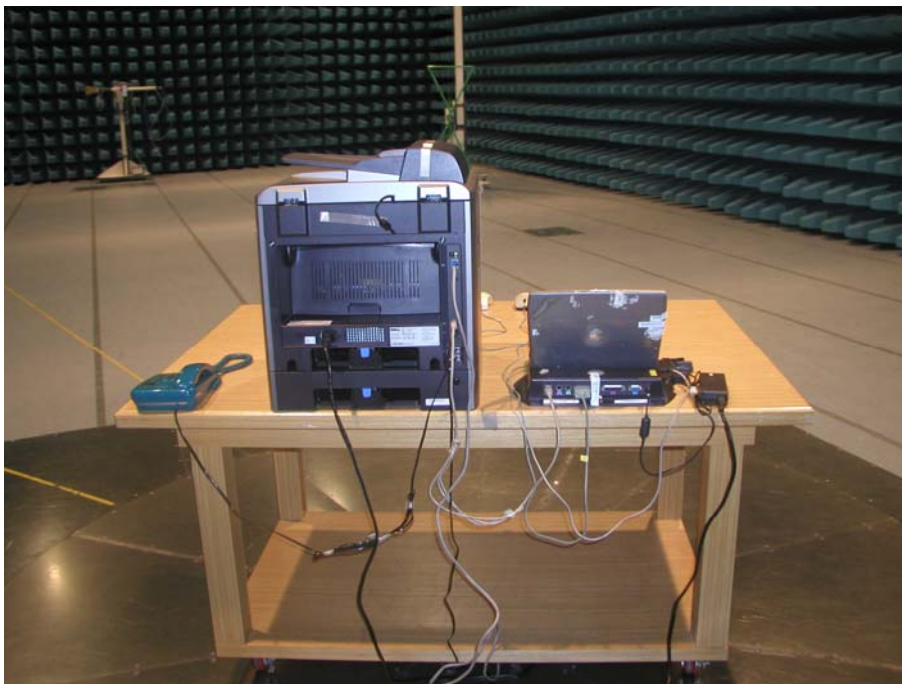
Picture 1. Conducted Emission (Front)



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 and Label Location)



Picture 7. Internal

	<b>Model No.:</b> Dell Laser MFP 1600n <b>Volts:</b> AC 110-127V <b>Hertz:</b> 50/60Hz <b>Amps:</b> 5.0A <b>Manufactured:</b> April 2004 <b>Ringer Equivalence :</b> 0.5B	<p>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.</p> <p>FCC ID: A3LLASERMFP1600N          Complies with Part 68, FCC Rules.          FCC Certification No.: US:A3LFA05BMFP1600n          This product complies with 21 CFR Chapter 1, subchapter J.          PLACE: M264</p> <p>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: 649E-MFP1600n</p>
	<p>Manufactured for Dell          Austin, Texas, USA          Made in China</p> <p>USOC Jack Type: RJ11C</p>	
		<p>(A) JC68-01313A04</p>
<p>LISTED          51Y7          E149091          I.T.E.          "HS-03"</p>		
 		<p>NÚMERO DE CERTIFICADO DE COFETEL: TTDELA04-338</p>

Picture 8. EUT (Label)

