

EMI TEST REPORT

According to FCC Part 15 Subpart B/Class B

Product : Multi Function Printer
Model No. : SF-565P

FCC ID : A3LSF565P

1. This test reports shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.
2. This test reports does not constitute an endorsement by NIST/NVLAP or U.S Government.
3. 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.
4. That data in this report are traceable to National or International Standards.

Date of test : December 12, 2003 ~ December 16, 2003

Issued Date : December 17, 2003

Tested by:


Min Gon, KIM / Test Engineer of EMC Lab.

Reviewed by:


No Cheon, PARK / Manager of EMC Lab.

Authorized by:


Kyu Baek, CHUNG / Chief of EMC Lab.

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 Code: 200623-

Table of Contents

1. General Information

- 1.1 Product Description
- 1.2 Configuration of EUT and peripherals
- 1.3 Used Cable Description
- 1.4 System Block Diagram of Test Configuration
- 1.5 Test Facility

2. System Test Configuration

- 2.1 Configuration of Radiated and Conducted Interference Measurement
- 2.2 Operation Environment
- 2.3 Test Procedure
- 2.4 Measurement Uncertainty

3. Conducted Emission Test Data

4. Radiated Emission Test Data

5. Label Configuration and Location

6. Test Equipment Used

Distribution

This test report has been made available as follows:

CS Management Center, EMC Laboratory	1 original
Printer Division	1 copy

1. General Information

Applicant : Samsung Electronics Co., Ltd.

Full Address : 416 Maetan 3 Dong, Yeongtong-Ku,
Suwon City, Kyungki Do, Korea, 442-742

Kind of Product : Multi Function Printer

FCC ID : A3LSF565P

Project Name : -

Model & Variant Names : **SF-560** (Brand : Samsung)
3810/F250/LF125m/1170L (Brand : Ricoh)

Remark)

SF-565P and 3810/F250/LF125m/1170L are supporting the FAX(TX ,RX), SCAN, COPY(ADF) and PRINTER Mode.

SF-560 is supporting the COPY(ADF), FAX(TX,RX) Mode.

Test Report Produced by : Min Gon, KIM / Test Engineer of EMC Lab.

1.1 Product Description

1) Justification

The system was configured for testing in typical fashion use. Cable 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.

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 was reported.

Further details of cabling and configuration are shown in the test system configuration.

2) Operating Frequency :

Video Clock : 14.7456 MHz
Main Clock : 10 MHz
CPU Clock : 66 MHz
SDRAM Clock : 66 MHz
CIS Clock : 500 kHz
Modem Clock : 28.224 MHz

3) Description of Testing operating mode

Operating Mode	Operating section of EUT
USB Printing	Continuously H pattern printing by Computer
Parallel Printing	Continuously H pattern printing by Computer
Fax Tx, RX	Continuously H pattern Receiving and Transmitting
Copying	Continuously H pattern Copying

EUT was tested all operating mode as above. Finally EUT was tested Copying mode as maximum emission.

4) Tested Resolution : N/A

Tested Video mode	Resolutions	Refresh rates	Colors

5) Manufacturer : Samsung Electronics Co., Ltd.

259, Gongdan-Dong, Gumi-City, Kyung-Buk, 730-030, Korea

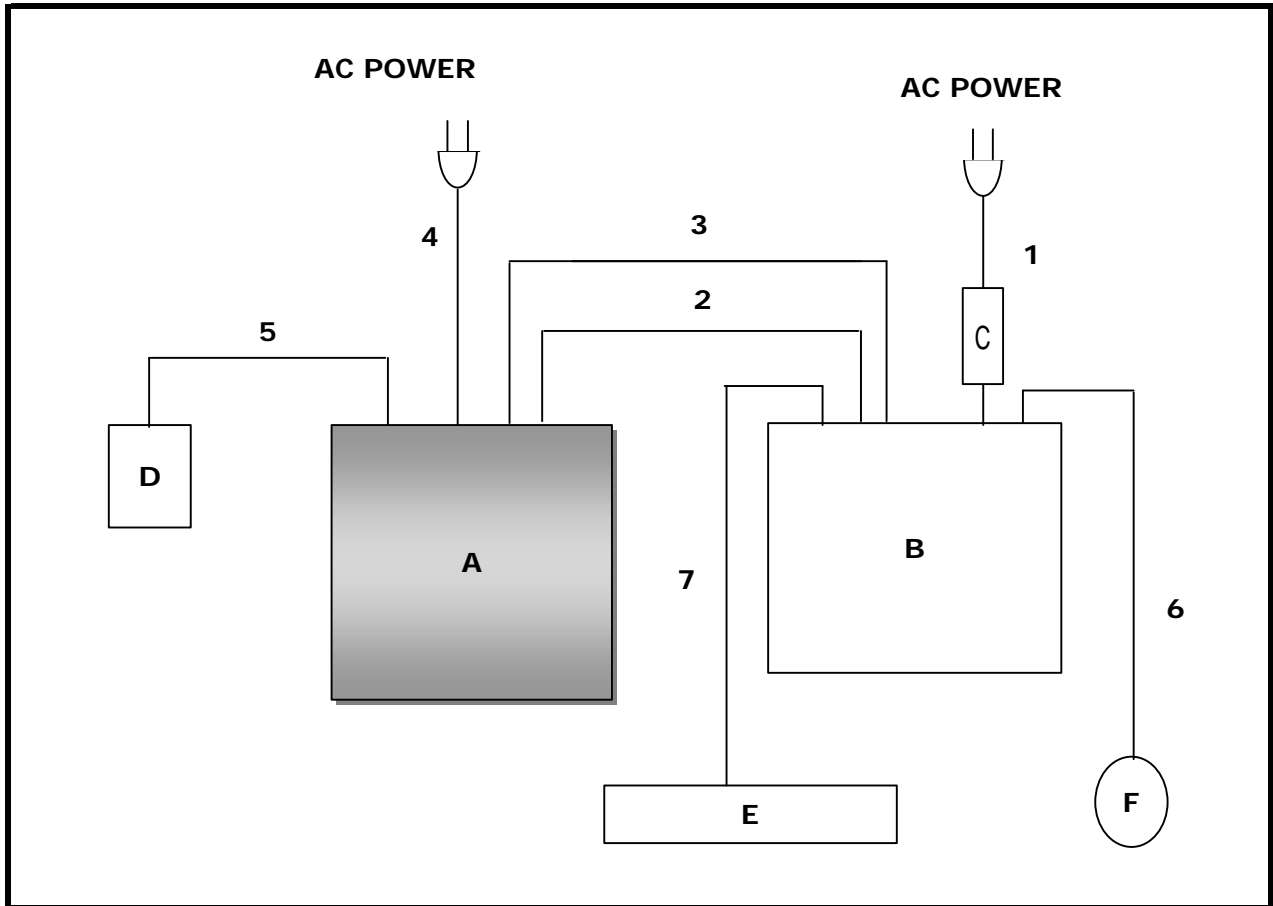
Shandong Samsung Telecommunications Co. Ltd.

Sanxing Road, Weihai Hi-Tech. IDZ Shandong Province, 264209, China

1.3 Used Cable Description

No.	Item	Length[m]	Shielded (Y/N)	Remark
1	AC Power Cable	1.7	N	For EUT
2	USB Cable	1.5	Y	-
3	Parallel Cable	1.5	Y	-
4	AC Power Cable	1.5	N	For PC
5	Tel Line	1.5	N	-
6	Mouse Cable	1.5	Y	-
7	Keyboard Cable	1.5	Y	-

1.4 System Block Diagram of Test Configuration



1.5 Test Facility

All test described in this report were performed by :
SAMSUNG ELECTRONICS CO., LTD.
EMC TESTING LABORATORY
416 Maetan 3 Dong, Yeongtong-Ku, Suwon City, Kyungki Do, Korea, 442-742
Semi Anechoic Chamber #2(Registration Number:873282) and Shielded Room.

This test facility has been filed in FCC under the criteria in ANSI C63.4-1995.

2. System Test Configuration

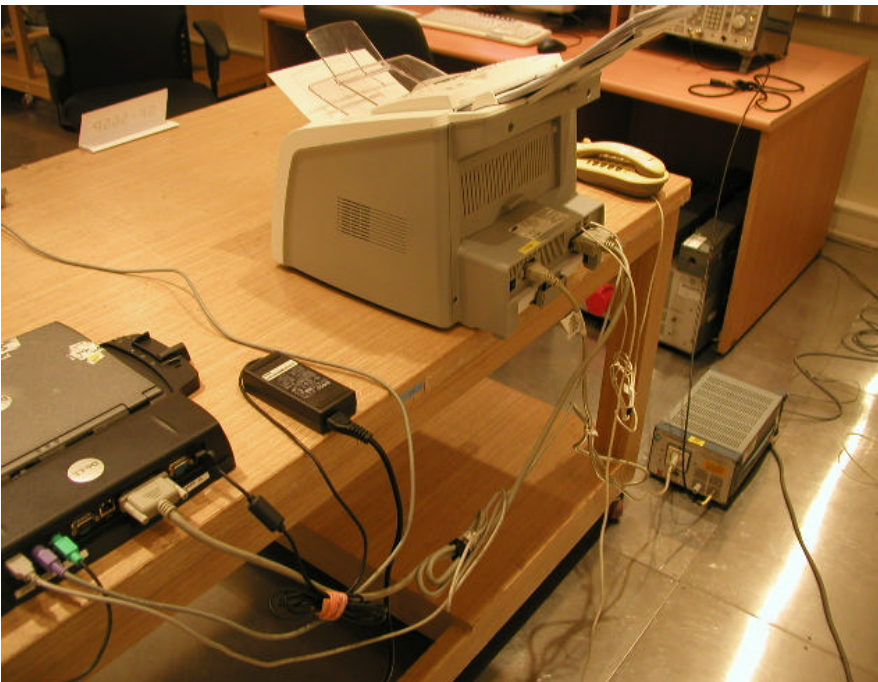
2.1 Configuration of Radiated and Conducted Interference Measurement

* Cabling was taken into consideration and test data was taken under worst case conditions.

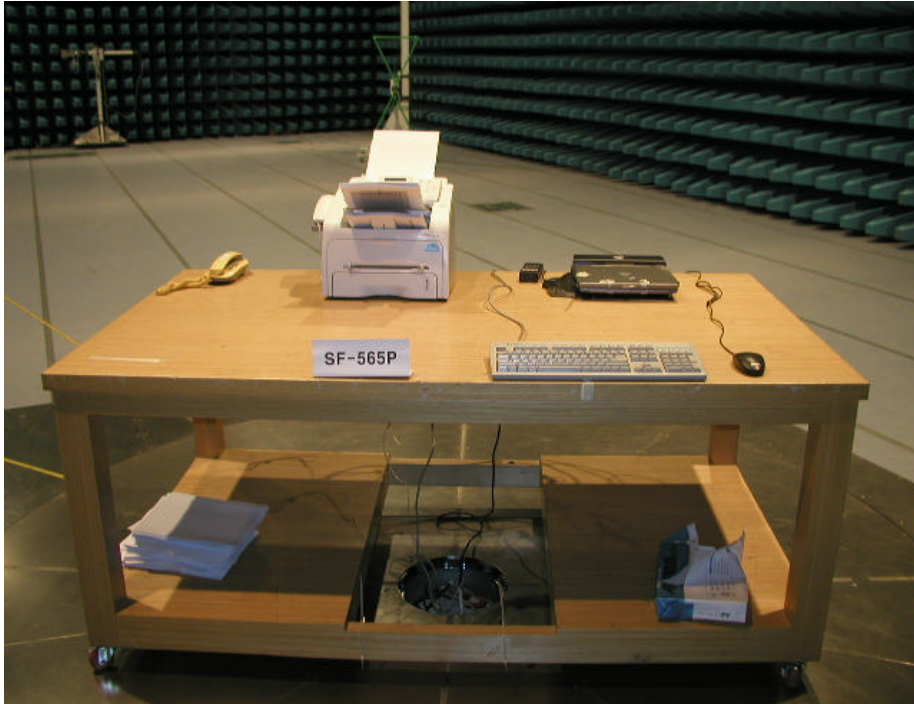
1)Conduction(Front View)



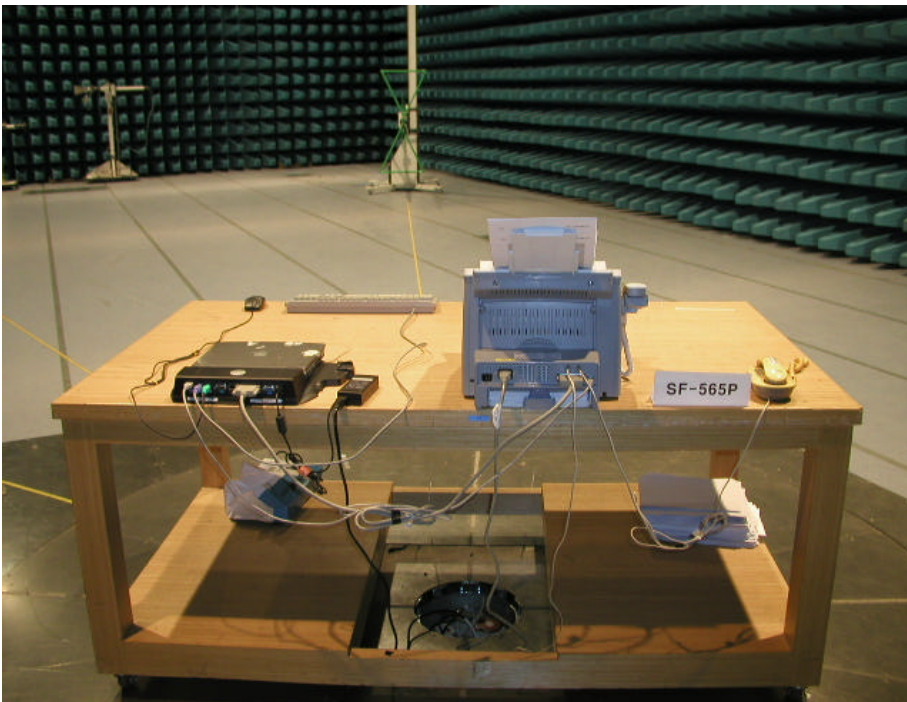
2)Conduction(Rear View)



3) Radiation(Front View)



4) Radiation(Rear View)



2.2 Operation Environment

	Conduction	Radiation
Temperature [C] :	23.5	23
Humidity [%] :	30	31
Power supply	: AC110V/60Hz	AC110V/60Hz

2.3 Test Procedure

2.3.1 Conducted Emissions

EUT was placed on a platform of 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.

The EUT was switched on and allowed to warm up to its normal operating condition.

A quick scan, from 150kHz to 30MHz, was made on the L1 & L2 line by LISN.

High peaks, relative to the limit line, over the frequency range were then selected.

The EMI TEST RECEIVER was then tuned to the selected frequencies.

CISPR quasi-peak measurements with a receiver bandwidth setting of 10kHz, were taken.

2.3.2 Radiated Emissions

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.

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.

Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment; powering the monitor from the floor mounted outlet box and the computer aux AC outlet if applicable, and changing the polarity of the antenna; whichever determined the worst-case emission.

3. Conducted Emission Test Data

O Test Mode : USB Printing

Quasi-Peak Data

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.150000	48.40	0.6	66	17.6	L1	GND
0.190000	50.20	0.6	64	13.9	L1	GND
0.340000	40.40	0.5	59	18.8	L1	GND
1.510000	35.30	0.6	56	20.7	N	GND
2.170000	35.20	0.5	56	20.8	N	GND
2.440000	34.40	0.5	56	21.6	L1	GND
2.700000	35.20	0.6	56	20.8	N	GND
2.770000	35.60	0.6	56	20.4	N	GND
2.830000	33.30	0.6	56	22.7	L1	GND
2.890000	33.70	0.6	56	22.3	L1	GND
2.900000	32.90	0.6	56	23.1	L1	GND
2.960000	32.70	0.6	56	23.3	L1	GND
3.020000	33.30	0.6	56	22.7	L1	GND
3.030000	37.60	0.6	56	18.4	N	GND
16.430000	38.00	1.6	60	22.0	L1	GND

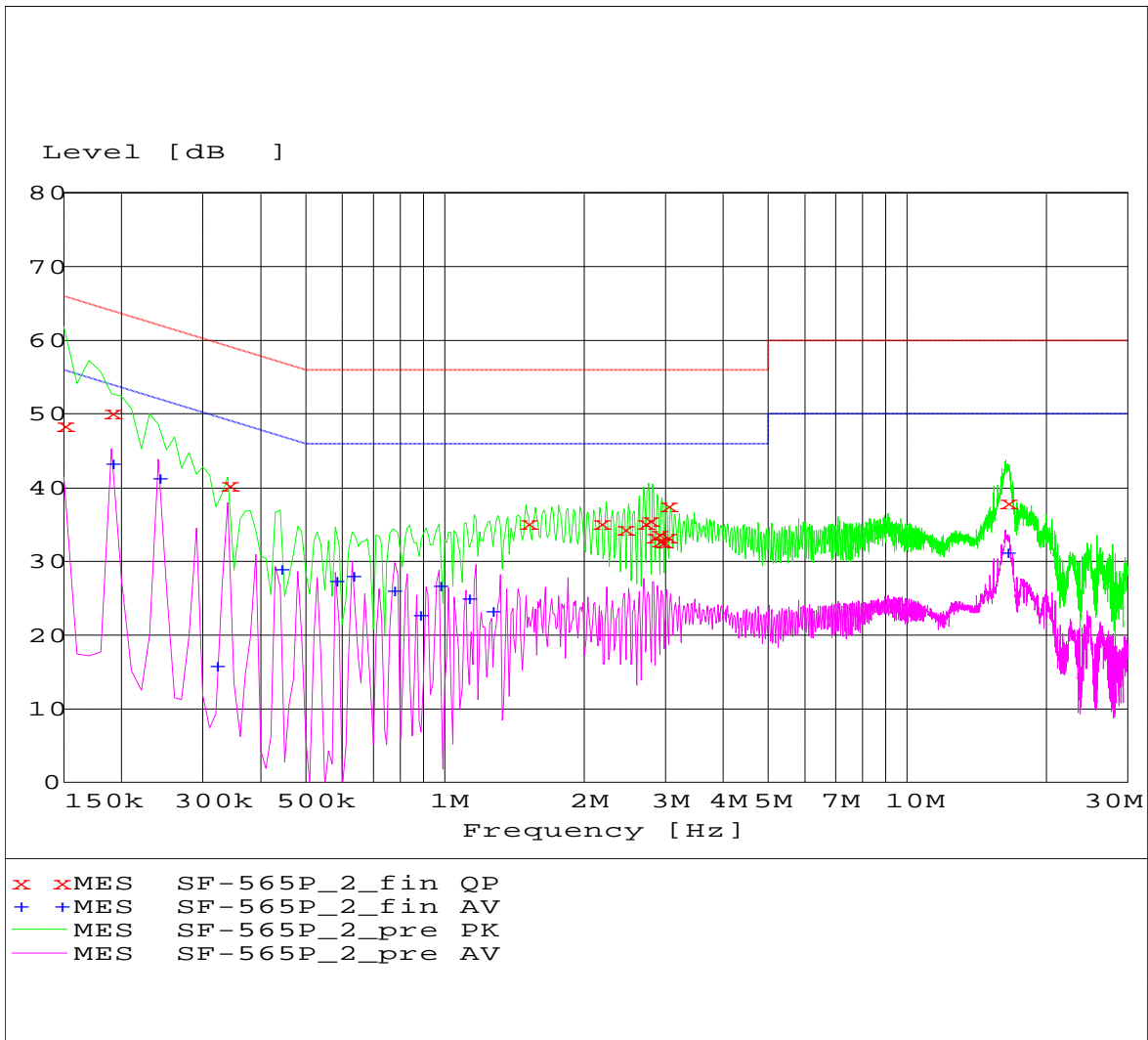
Average Data

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.190000	43.40	0.6	54	10.6	L1	GND
0.240000	41.40	0.5	52	10.7	N	GND
0.320000	15.80	0.5	50	33.9	N	GND
0.440000	29.00	0.5	47	18.1	L1	GND
0.580000	27.40	0.6	46	18.6	N	GND
0.630000	28.10	0.6	46	17.9	N	GND
0.770000	26.10	0.5	46	19.9	N	GND
0.880000	22.70	0.5	46	23.3	N	GND
0.970000	26.80	0.6	46	19.2	N	GND
1.120000	25.00	0.6	46	21.0	N	GND
1.260000	23.30	0.6	46	22.7	N	GND
16.420000	31.30	1.6	50	18.7	L1	GND

* Results = Meter Reading(QP) + Total Loss(LISN Insertion loss + Cable loss)

* Margin = Limits - Result

3-1. Conducted Emission Test Graph



4. Radiated Emission Test Data

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Height cm	Azimuth deg	Polarisation
32.400000	23.60	17.7	30.0	6.4	100.0	122.00	VERTICAL
36.480000	19.30	15.6	30.0	10.7	129.0	182.00	VERTICAL
43.600000	20.30	11.8	30.0	9.7	100.0	180.00	VERTICAL
48.560000	21.10	9.5	30.0	8.9	129.0	120.00	VERTICAL
56.640000	22.70	7.1	30.0	7.3	260.0	223.00	VERTICAL
80.480000	17.30	8.2	30.0	12.7	127.0	159.00	VERTICAL
99.680000	20.80	11.9	30.0	9.2	303.0	182.00	HORIZONTAL
132.080000	16.10	13.1	30.0	13.9	254.0	170.00	VERTICAL
166.000000	18.80	11.3	30.0	11.2	393.0	122.00	HORIZONTAL
332.240000	25.20	16.7	37.0	11.8	400.0	84.00	HORIZONTAL
398.960000	26.90	18.9	37.0	10.1	100.0	229.00	VERTICAL
581.440000	26.30	22.6	37.0	10.7	384.0	36.00	HORIZONTAL
765.920000	27.40	24.3	37.0	9.6	120.0	240.00	HORIZONTAL
965.120000	29.80	25.6	37.0	7.2	150.0	120.00	VERTICAL

* "<" Means equal or less then 5dB

* Receiving Antenna Mode : **Horizontal, Vertical**

* Results = Meter Reading + Total Loss(Antenna factor + Cable loss)

* Measurement detector function and bandwidth

Detector function : CISPR quasi-peak(Above 1000MHz: Peak)

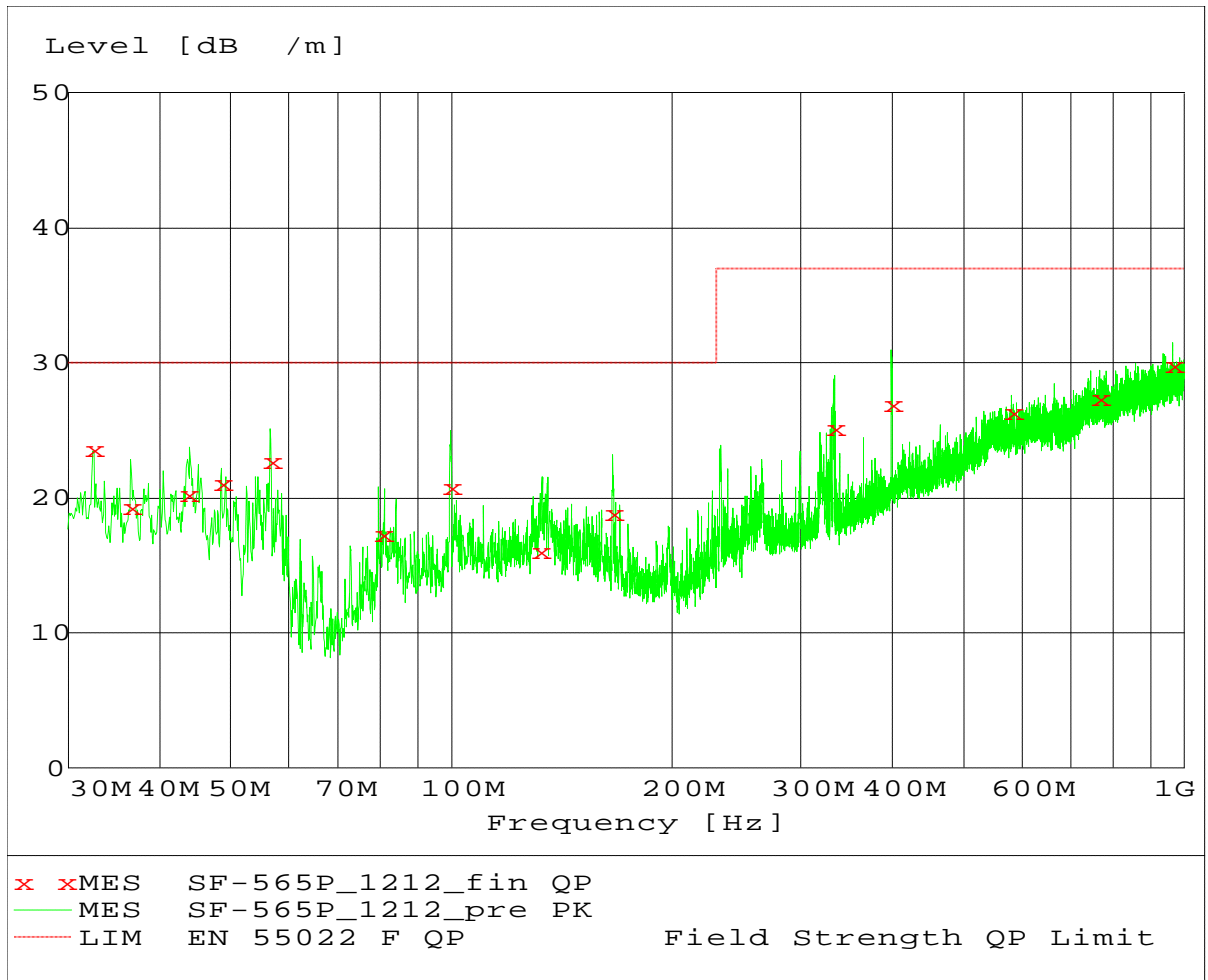
Resolution Bandwidth : 120kHz(Above 1000MHz: 1MHz)

* Test distance

- Below 1000MHz: 10m(Quasi-peak)



- Above 1000MHz: 10m(Peak)

4-2. Radiated Emission Test Graph



5. FCC Label Configuration and Location

5.1 Label Configuration

	Model No.: SF-565P Volts: AC 100-127V Hertz: 50/60Hz Amps: 4.0A Manufactured: OCTOBER 2003 Ringer Equivalence	<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: A3LSF565P Complies with Part 68, FCC Rules. FCC Registration No.:</p> <p>This product complies with 21 CFR Chapter 1, subchapter J. COMPANY NAME: Samsung Electronics Co., Ltd. ADDRESS: 258, Gongdan-Dong, Gumi-City, Kyung-Buk, 730-030, Korea Place#258</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.</p> <p>IC: 649E-SF565P</p>
USOC Jack Type: RJ11C		
Serial No.:		MADE IN KOREA JC68-01065A Rev.1.0

5.2 Location of Label



6. Test Equipment Used

Equipment	Model No.	Serial No.	Makers	Calibration Last calibration and Interval
Field strength meter	ESCS30	830986/004	R & S	03/04/03, 12Months
	Firmware versions : Main 1.08, OTP 02.01, GRA 02.03			
Field strength meter	ESI26	100019	R&S	03/07/09, 11Months
L.I.S.N	3810/2NM	EMCO	2251	03/02/07, 12Months
L.I.S.N	ESH3-Z5	831856/0006	R & S	03/02/07, 12Months
Bi-Log Antenna	CBL6112B	2805	Schaffner	03/04/02, 12Months