

EMC TEST REPORT

According to FCC Part 15B Class B

Project NO. : LBE030209

Product : Multi Function Printer

Model No. : SCX-4216F

Date of test : January 27, 2003 ~ January 29, 2003

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1. General Information

APPLICANT : SAMSUNG ELECTRONICS CO., LTD.

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REGULATION(S) : FCC Part 15B Class B

Model & Variant Names : : **SCX-4216F**
SCX-4116
SCX-4016

SERIAL NUMBER : -

KIND OF PRODUCT : Multi Function Printer

TESTED DATE : January 27, 2003 ~ January 29, 2003

TEST SITE : SAMSUNG EMC TEST LAB.
FCC Registration Number : 873282
Anechoic Chamber #2

1.1 Product Description

SCX-4216F is supporting the FAX(TX ,RX),SCAN(ADF,FLATEN),PRINTER Mode.

SCX-4116 is supporting the SCAN(ADF,FLATEN),PRINTER Mode.

SCX-4016 is supporting the SCAN(FLATEN),PRINTER Mode.

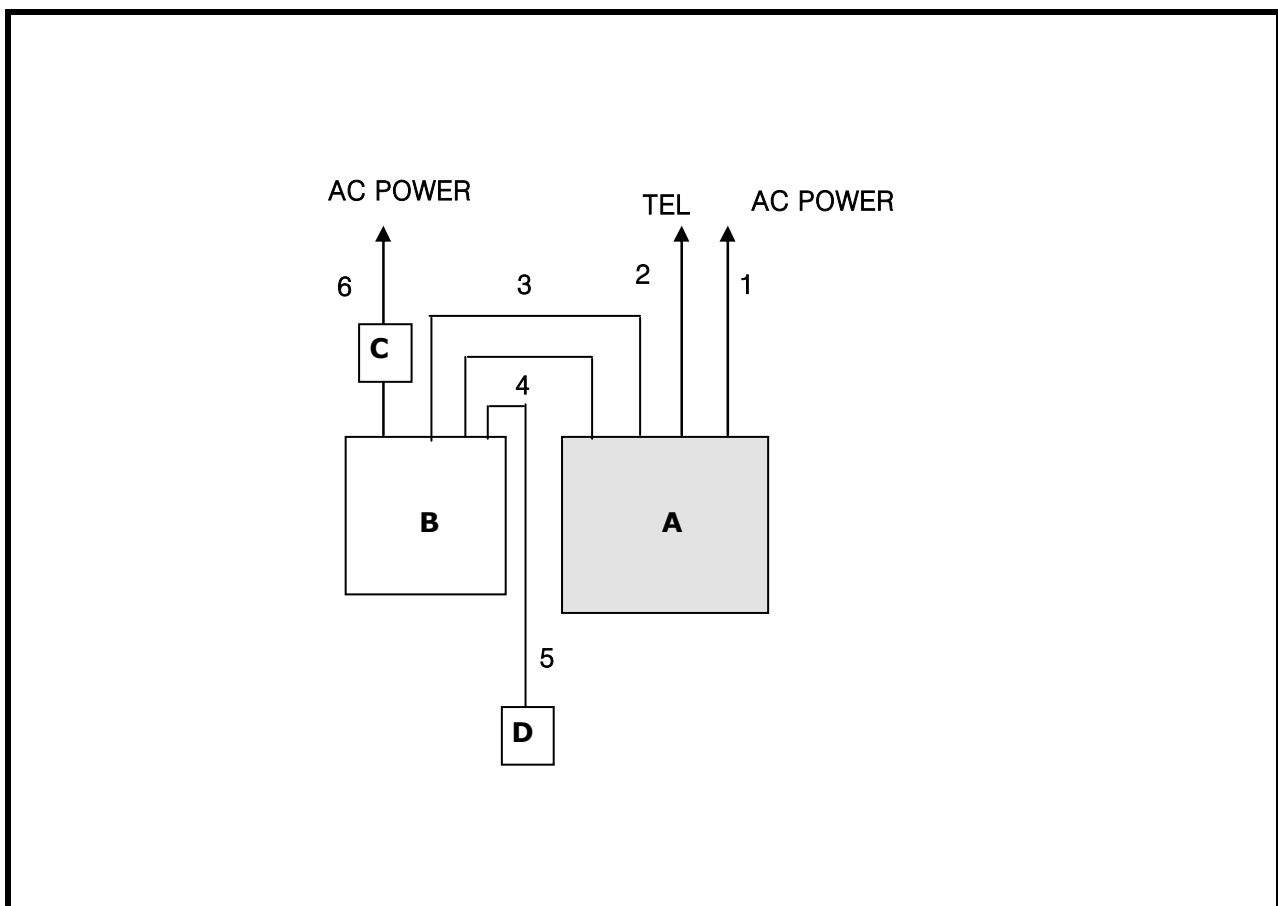
SCX-4x16 models have

System clock 10MHz, Modem clock 28.224MHz, CPU clock 66MHz,

RTC clock 32.768kHz, OPE-Micom clock 7.37MHz ,Video clock 14.7456 KHz

Video 1/4 clock 11.059 MHz ,USB clock 48MHz.

1.2 System Block Diagram of Test Configuration



2.5.2 Configuration of EUT and peripherals

Mark	Item	Model No.	Serial No.	Manufacturer	Remark
A	Plain Paper Fax	SCX-4216F	-	Samsung	EUT
B	Note PC	PP01X	CN-03J010-12961-29N	DELL	-
C	AC Adapter	ADP-90FB	TH-06G356-17971-29C-27ET	DELL	-
D	Mouse	M-UR69	LNB23424350	Logitech	-

2.5.3 Used Cable Description

No.	Item	Length[m]	Shielded(Y/N)	Remark
1	AC Power Cable	1.7	N	
2	Tel line	2.0	N	
3	USB Cable	1.5	Y	
4	Parallel Cable	1.5	Y	
5	Mouse Cable	1.5	Y	
6	AC Power Cable	2.0	Y	

2. System Test Configuration

2.1 Configuration of Radiated and Conducted Interference Measurement

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

1)Conduction(Front View)



2)Conduction(Rear View)



3) Radiation(Front View)



4) Radiation(Rear View)



2.2 Operation Enviroment

	Conduction	Radiation
Temperature [centigrade] :	24.8	21.2
Humidity [%] :	20	23
Power supply :	AC120V/60Hz	AC120V/60Hz

2.3 Justification

The system was configured in typical fashion(as a customer would normally use it) for testing.

2.4 EUT Exercise Soft ware

The EUT exercised all possible mode during radiated and conducted testing was designed to exercise the various system components in a manner similar to typical use.

2.5 Test Procedure

2.5.1 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.

2.5.2 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.

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 to obtain the maximum signal strength.

3. Conducted Emission Test Data

The initial step in collecting conducted data was to perform a quasi-peak scan over the measurement range using a receiver.

The final data represents worst-case emissions.

O Test Mode :

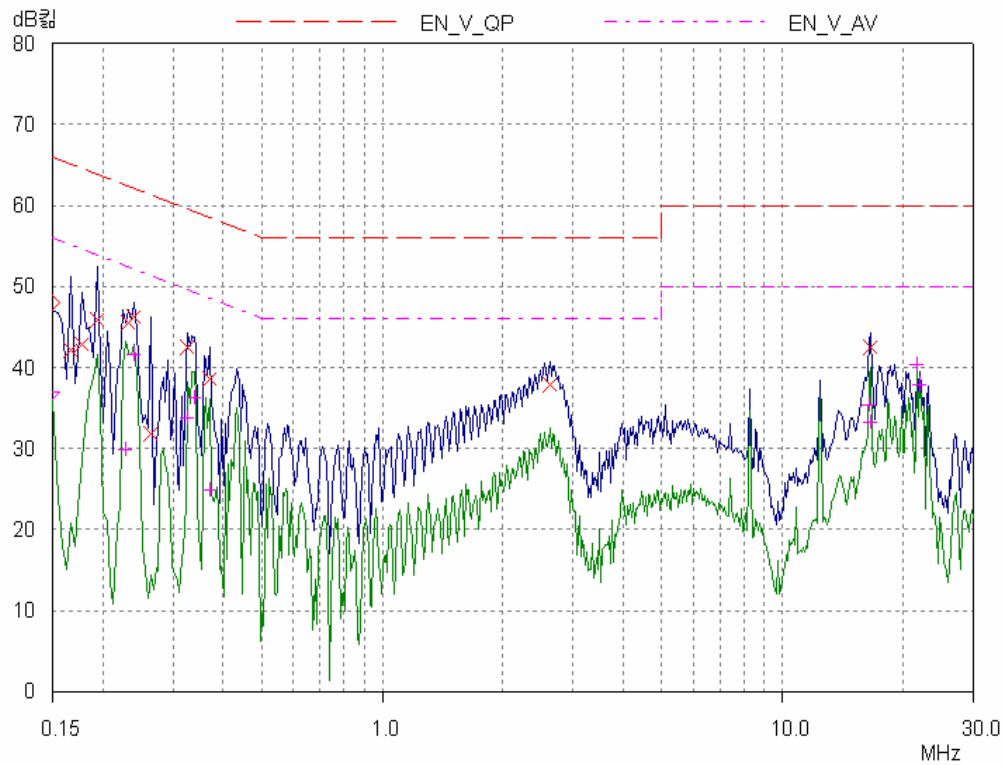
Frequency [MHz]	Meter reading (a)		Phase	Total Loss (b) [dB]	Limits		Result	
	QP	AV			QP	AV	QP	AV
	[dBuV]				[dBuV]		[dBuV]	
0.166	42.2		L	0.6	65.2	55.2	42.8	
0.177	42.9		L	0.6	64.6	54.6	43.5	
0.193	45.8		L	0.6	63.9	53.9	46.4	
0.232	45.6		L	0.6	62.4	52.4	46.2	
0.240	46.2		L	0.6	62.1	52.1	46.8	
0.263	31.8		L	0.6	61.3	51.3	32.4	
0.326	42.5		L	0.5	59.6	49.6	43.0	
0.369	38.5		N	0.5	58.5	48.5	39.1	
2.599	37.9		L	0.6	56.0	46.0	38.5	
16.498	42.4		L	1.5	60.0	50.0	43.9	

※ Quasi-peak value is less 10dB than Average limits.

* 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

The initial step in collecting radiated data was to perform a quasi-peak scan over the measurement range using a receiver.

All modes of operation were investigated and the worst-case emission are reported.

All other emission are non-significant.

The minimum margin to the limit is as follows :

O Test Mode : Random Read

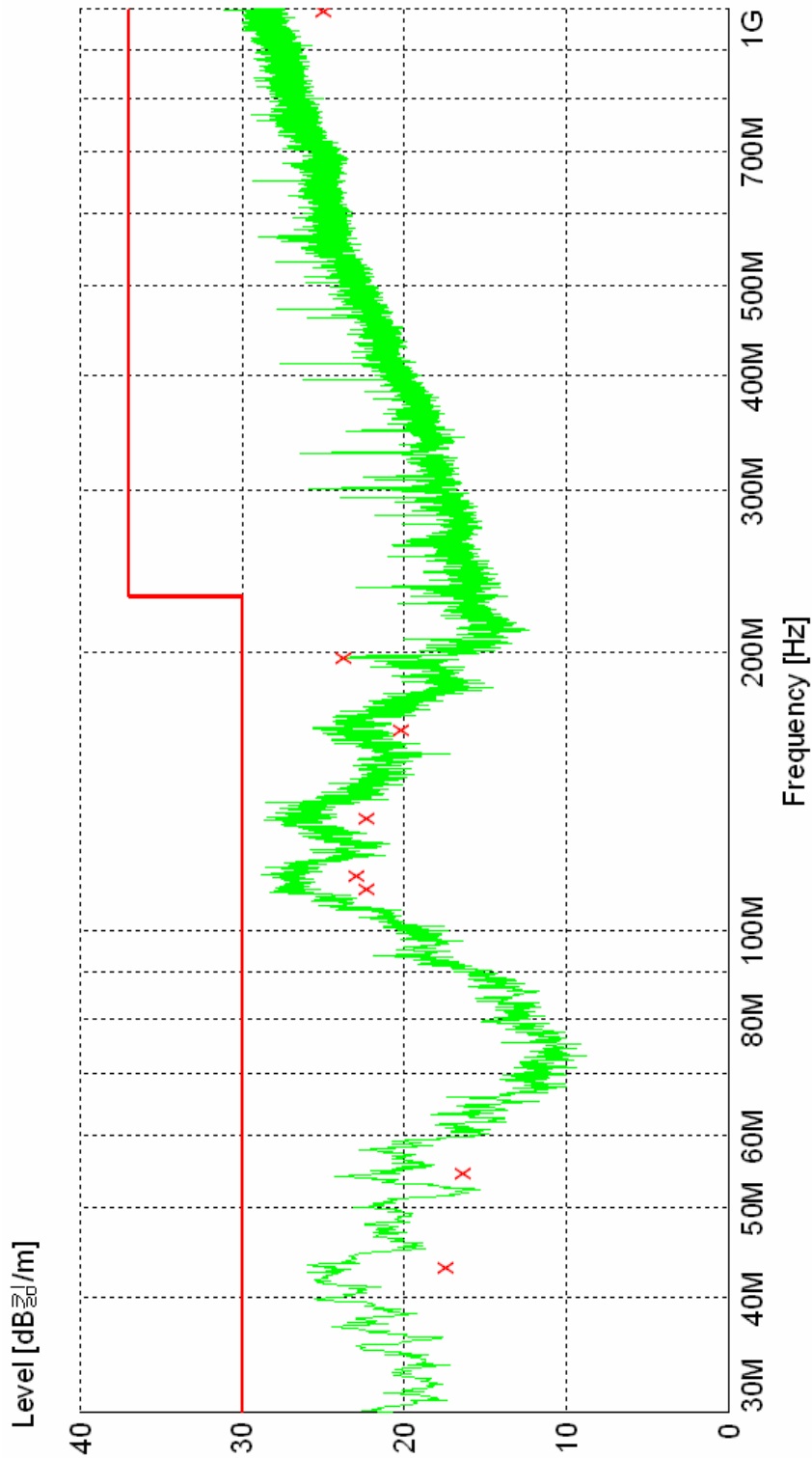
Frequency Range [MHz]	Tested Frequency [MHz]	ANT Pol.	Meter Reading [A] [dBuV/m]	Total Loss [B] [dB]	Antenna Height [Cm]	Turn table Degree [Deg]	Results [A+B] [dBuV/m]	Limits [dBuV/m]	Margin (Limit-Result) [dB]
30 - 230	43.100	V	5.6	12.0	143	40	17.6	30.0	12.4
	54.500	V	9.0	7.6	241	41	16.6	30.0	13.4
	110.700	V	9.3	13.2	100	198	22.5	30.0	7.5
	114.900	V	9.9	13.2	100	212	23.1	30.0	6.9
	132.100	V	9.3	13.2	164	145	22.5	30.0	7.5
	165.100	V	9.1	11.3	100	192	20.4	30.0	9.6
	197.900	V	13.0	10.9	100	180	23.9	30.0	6.1
230 - 1000	997.000	V	0.1	25.9	400	38	26.0	37.0	11.0

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

* Test distance : 10m

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

4-2. Radiated Emission Test Graph



5. Test Equipment Used

Equipment	Model No.	Serial No.	Makers	Calibration Last calibration and Interval
Field strength meter	ESCS30	830986/004	R & S	02/ 02/15, 12Months
	Firmware versions : Main 1.08, OTP 02.01, GRA 02.03			
Field strength meter	ESI	100010	R & S	02/ 05/04, 12Months
L.I.S.N	3810/2NM	EMCO	2251	02/05/07, 12Months
L.I.S.N	ESH3-Z5	831887/0004	R & S	02/ 08/06, 12Months
Bi-Log Antenna	CBL6112B	2804	Schaffner	02/04/23, 12Months