SAMSUNG ELECTRONICS

EMC TEST REPORT

According to FCC Part 15B Class B

Project NO. : E2-02-0077

Product : CD-R/RW DVD Drive

Model No. : SM-332 (VER:B)

Date of test : April 24, 2002 - April 29, 2002

Issued Date : May 02, 2002

Tested by: Choon Kil Kim
Choon Kil, Kim / Test Engineer

Reviewed by: Yang S. Kim
Yang Soo, KIM / Technical Manager

Authorised by: Yang S. Kim
Yang Soo. KIM / Quality Manager

SAMSUNG ELECTRONICS Co., Ltd.
Suwon EMC Test Laboratory
416 Maetan-3 Dong, Paldal-Ku, Suwon City, Kyungki-Do, Korea,442-742
Tel. : 81-31-200-2185 Fax. : 81-31-200-2189

This report shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.

Table of Contents

1. General Information
1.1 Product Description
1.2 System Block Diagram of Test Configuration

2. System Test Configuration
2.1 Configuration of Radiated and Conducted Interference Measurement
2.2 Operation Enviroment
2.3 Justification
2.4 EUT Exercise Soft ware
2.5 Test Procedure

3. Conducted Emission Test Data

4. Radiated Emission Test Data

5. Test Equipment Used

This report shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.

1. General Information

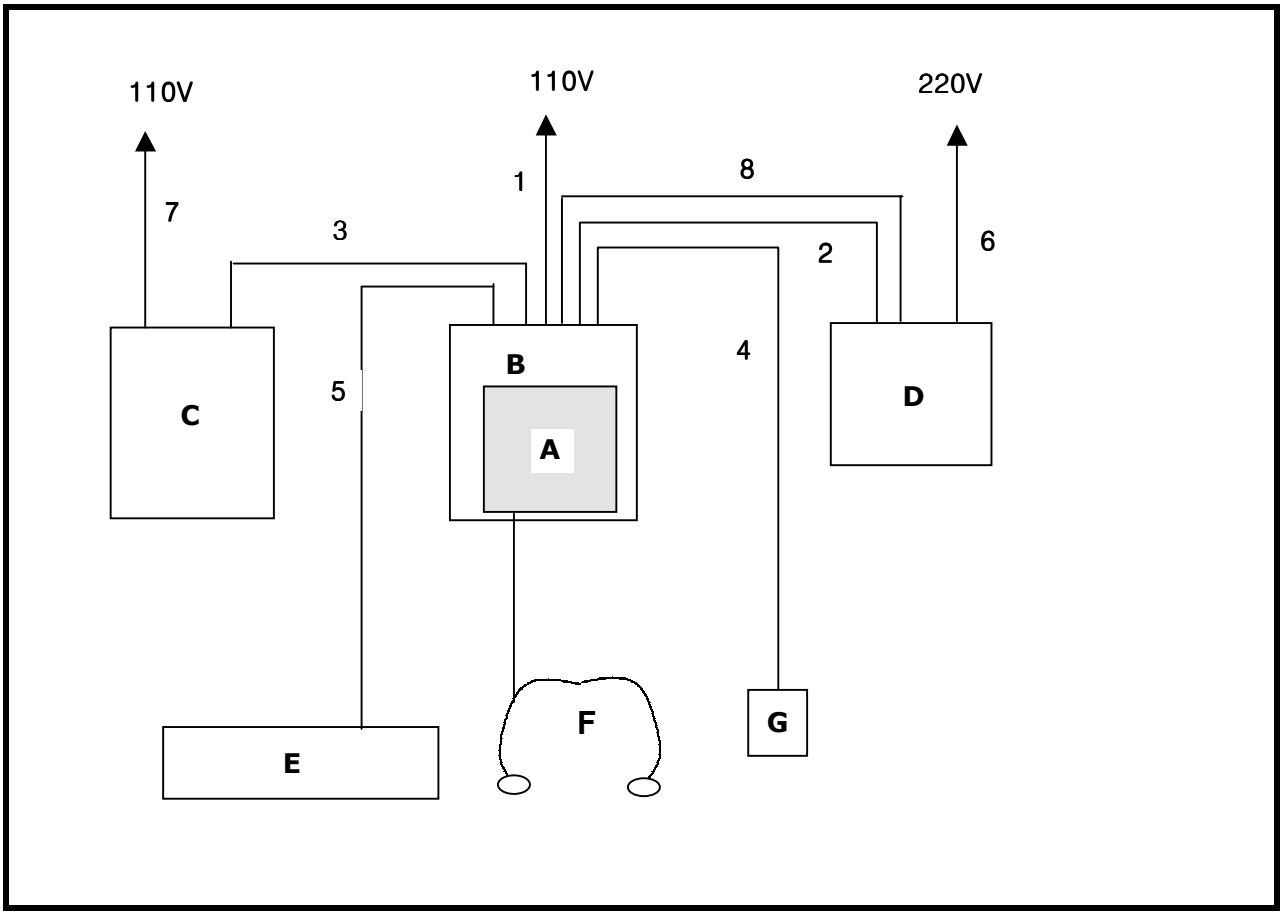
APPLICANT	:	SAMSUNG ELECTRONICS CO., LTD.
ADDRESS	:	416 Maetan 3 Dong, Paldal-Ku, Suwon City, Kyungki Do, Korea, 442-742
CONTACT ADDRESS	:	416 Maetan 3 Dong, Paldal-Ku, Suwon City, Kyungki Do, Korea, 442-742
CONTACT PERSON	:	Ki Ho,Kim
REGULATION(S)	:	FCC Part 15B Class B
MODEL NUMBER	:	SM-332 (VER:B)
SERIAL NUMBER	:	-
KIND OF PRODUCT	:	CD-R/RW DVD Drive
TESTED DATE	:	April 24, 2002 - April 29, 2002
TEST SITE	:	SAMSUNG EMC TEST LAB. FCC Registration Number : 98856 Anechoic Chamber NO 1

This report shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.

1.1 Product Description

Speed	CDR: 10X, DVD : 32X
Access Time	CD-RW(110ms), DVD(110/130ms)
Buffer	8MB
Interface	ATAPI BUS(E-IDE)
Size	148.2(W) * 42(H) * 184(D) mm

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	CD-Rom Drive	SM-332 (VER:B)	-	Samsung	EUT
B	Computer	Netvista	1S6841EA623A5618	IBM	
C	Monitor	CX151S-AZ	N192H4NT319256	Samsung	
D	Printer	DocuprintP8ex	JC68-30927F	Xerox	
E	KeyBoard	IBM	1S37L25141366363B	IBM	
F	Ear phone	-	-	SONY	
G	Mouse	M-S35	LZB05162649	Logitech	

2.5.3 Used Cable Description

No.	Item	Length[m]	Shielded(Y/N)	Remark
1	AC Power cable	1.7	N	
2	USB cable	2.0	Y	
3	Video cable	1.8	Y	
4	Mouse cable	2.0	N	
5	Keyboard Cable	1.8	N	
6	AC Power cable	1.7	N	
7	AC Power cable	1.7	N	
8	Centronics cable	2.0	Y	

This report shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.

2. System Test Configuration

2.1 Configuration of Radiated and Conducted Interference Measurement

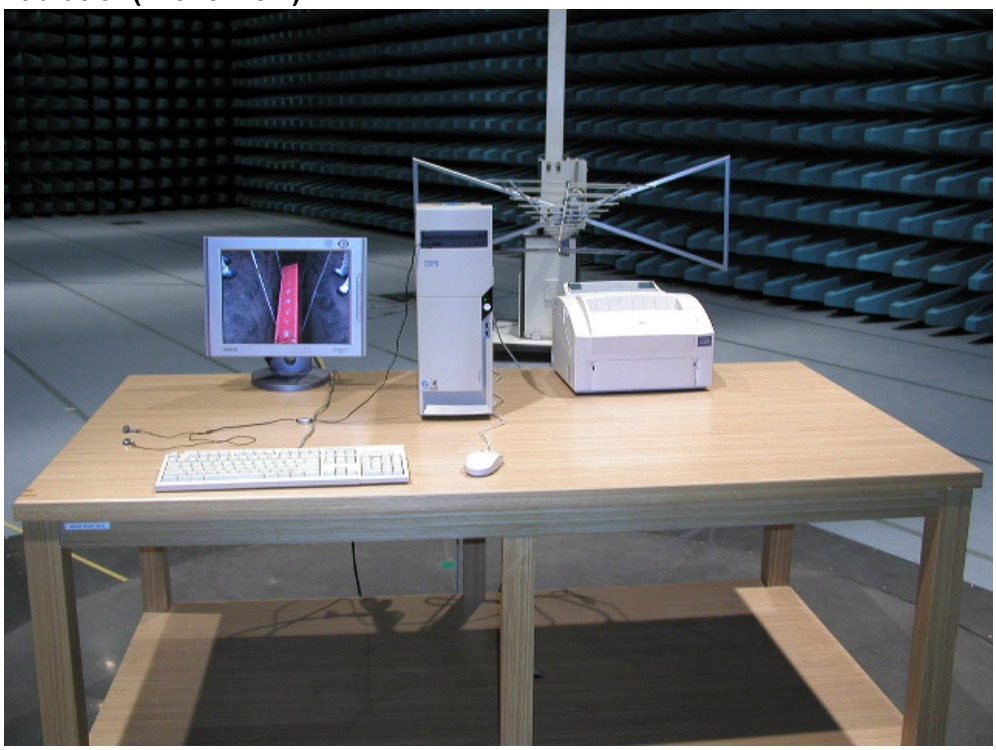
Cabling was taken into consideration and test data was taken under worse case conditions.

1)Conduction(Front View)

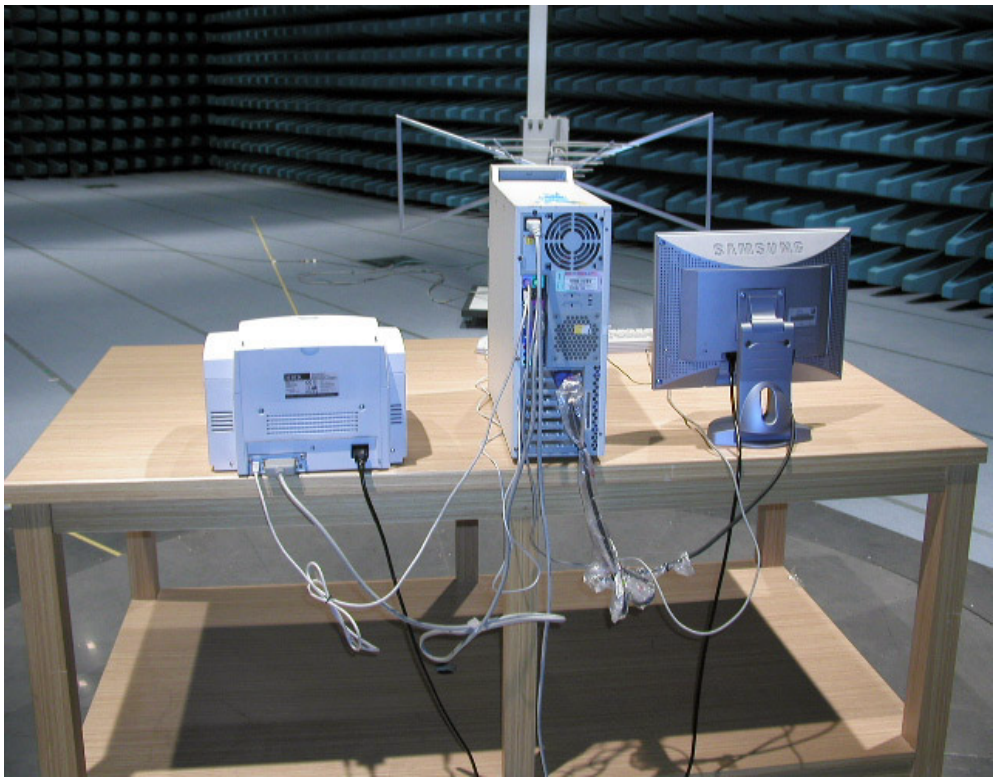
2)Conduction(Rear View)

This report shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.

3) Radiation(Front View)



4) Radiation(Rear View)



This report shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.

2.2 Operation Enviroment

	Conduction	Radiation
Temperature [centigrade] :	22	22.5
Humidity [%] :	39	41
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 exercise program used 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.

This report shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.

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.

This report shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.

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) Line(L1)	Total Loss(b) [dB]	Results (a) + (b) [dBuV]	Limits [dBuV]	Margin [dB]
0.450	32.1	0.5	32.6	**48.0**	15.4
0.891	28.7	0.5	29.2	**48.0**	18.8
17.887	27.1	1.0	28.1	**48.0**	19.9
17.926	28.0	0.8	28.8	**48.0**	19.2
18.278	27.4	0.6	28.0	**48.0**	20.0
18.469	26.5	1.5	28.0	**48.0**	20.0
19.145	27.0	1.0	28.0	**48.0**	20.0
19.196	26.8	1.1	27.9	**48.0**	20.1

* Results = Meter Reading(QP) + Total Loss(LISN Insertion loss + Cable loss)
* Margin = Limits - Result

This report shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.

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 at 3m [dBuV/m]	Margin (Limit-Result) [dB]
30 - 88	31.980	V	16.5	19.5	125	284	35.0	**40.0**	5.0
	33.660	V	15.6	18.7	131	152	34.3	**40.0**	5.7
	57.635	H	21.5	8.9	118	167	30.4	**40.0**	9.6
	69.550	H	22.4	9.9	115	124	32.3	**40.0**	7.7
88 - 216	98.742	V	19.2	10.8	106	182	30.0	**43.5**	13.5
	143.570	H	20.4	11.5	128	120	31.9	**43.5**	11.6
	176.821	H	17.6	9.3	162	150	26.9	**43.5**	16.6
	195.350	V	22.5	9.5	185	63	32.0	**43.5**	11.5
216 - 960	671.460	V	0.9	21.5	100	130	22.4	**46.4**	24.0
	799.860	H	0.5	23.8	117	175	24.7	**46.4**	21.7
	815.820	V	0.2	24.4	135	53	24.8	**46.4**	21.6
	873.300	V	0.3	24.7	100	343	27.2	**46.4**	19.2

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

** Test distance : 3m*

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

This report shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.

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	100019	R & S	01/ 05/19, 12Months
L.I.S.N	ESH2-Z5	831886/006	R & S	01/ 11/20, 12Months
L.I.S.N	ESH3-Z5	831887/0004	R & S	01/ 07/27, 12Months
Bi-Log Antenna	HL562	100005	R & S	01/08/02, 12Months
Bi-Log Antenna	CBL6112B	2767	SCHAFFNER	01/05/23, 12Months

This report shall not be reproduced except in full, without the written approval of SEC EMC Testing laboratory.