

Emission of electromagnetic disturbance

Test Report No. : ERI-FCC05-0026
Equipment : External DVD±R/RW DRIVE
Name of basic model : SE-W164
Family model : None
FCC ID : RWASE - W164
Manufacturer : Samsung Electronics Indonesia
Applicant : Toshiba Samsung Storage Technology Korea Corporation.
Tested date : 2005. 05.13- 05. 23.
Issued date : 2005. 05.23.
Test results : PASS
Test Standards : FCC Part 15 Subpart B (Class B)
 /Other Class B digital devices & peripherals

Affirmation	Measurements performed by Name : Kim, Young-Sil 	Approved by Title : Manager Name: Rim, Uk-CI 
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EMC Research Institute President



May 23, 2005

The above test certificate is the accredited test results by Korea Laboratory
 Accreditation Scheme, which signed the ILAC-MRA.

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APPENDIX (NONE)

1. CLIENT INFORMATION

The EUT has been tested by request of :

Company : Toshiba Samsung Storage Technology Korea Corporation.
Address : 416, Maetan-3dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, Korea.
Name of contact : Sang-Keun, Lee
Telephone : +82-31-200-7909
Facsimile : +82-31-200-7890

2. LABORATORY INFORMATION

The 10 m full-anechoic chamber and/or EMC facilities are used for these testing.
These facilities were accredited by KOLAS, EK, MIC of Korea and FCC of USA.

Address

EMC RESEARCH INSTITUTE.

66-6, JEIL-RI, YANGJI-MYUN, YOUNGIN-CITY, GYEONGGI-DO, KOREA

Telephone No. : +82-31-336-1186~7

Facsimile No. : +82-31-336-1184

Registered No.

KOLAS : 111

EK : J

MIC : KR0030

FCC Filing No. : 302567

3. EQUIPMENT UNDER TEST INFORMATION (EUT)

3.1 Identification of the EUT

Type of equipment : External DVD±R/RW DRIVE
Model name : SE-W164
Family name : None
Manufacturer : Samsung Electronics Indonesia
Address : Toshiba Samsung Storage Technology Korea Corporation.
Telephone : +82-31-200-7909
Facsimile : +82-31-200-7890
Country of origin : Korea
Rating :

3.2 Additional information about the EUT

Classification : Class B

The essential components for EUT working is below.

Units	Model No.	Serial No.	Manufacture
-	-	-	-

Family Models List: None

Basic Model	Variant Model	Differential point
-	-	-
-	-	-

3.3 Peripheral equipment

Equipment needed to operate the EUT correctly is following.

Description	Model No.	Serial No.	Manufacture
Note PC	CM2080	5Y17JNZZ9R892	LG
AC/DC adaptor	ADP-60DB	MJD013400B510	DELTA ELECTRONICS CO., LTD.
Printer	C6427A	CN13V1B1RY	HP
Mouse	X08-70400	3902C693	HP
AC/DC adaptor	DA-30C01	549468383	Asian Power Devices Inc.
-	-	-	-
-	-	-	-

4. TEST SPECIFICATIONS

4.1 Standards

The standards for a EUT are the following:

FCC Part 15 Subpart B (Class B) /Other Class B digital devices & peripherals

5. TEST RESULTS

The results in this report apply only to sample tested:

Standards	Test items / Frequency	Result
ANSI C63.4-1992	1. Main Terminal disturbance voltage : 150 kHz – 30 MHz	Pass
ANSI C63.4-1992	2. Radiated disturbance : 30 MHz – 5 000 MHz	Pass

*** clock : Max 800 MHz**

5.1 CONTINUOUS DISTURBANCE VOLTAGE, MAIN TERMINAL

: Frequency range 0.15 MHz to 30 MHz

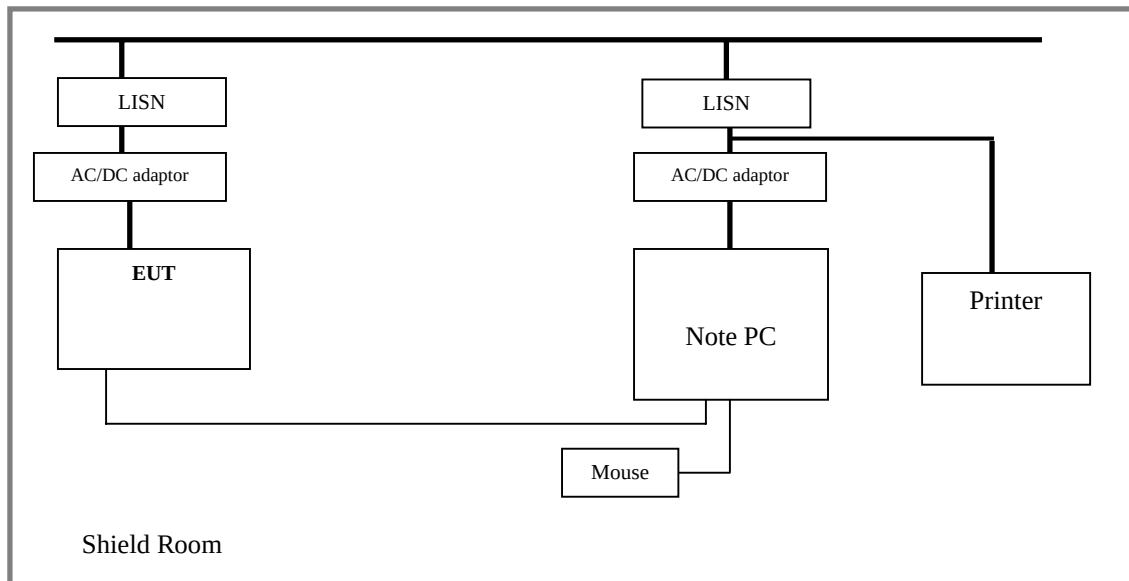
5.1.1 Operating environment

Temperature : 19.0 ± 5 °C
Relative Humidity : 39.0 ± 5 %
Atmospheric pressure : 1000 ± 5 mbar

5.1.2 Test set-up and test procedures



Continuous Disturbance Voltage, Main Terminal



The mains terminal of the EUT was measured in a shield room. The EUT was connected to an artificial mains network(AMN) placed on the floor and placed on non-metallic table 80Cm above the metallic, grounded floor. the AMN was 80Cm from the EUT and at least 80Cm from other Units and other metal planes. The measurements were performed with a quasi-peak detector and an average detector.

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Operation condition: DVD R/RW & DVD play mode

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5.1.3 Test instrument

Instrument	Model No	Makers	Serial No.	Next cal.date	Used
Test receiver	ESCS30	R&S	100022	2005. 5. 30	x
L.I.S.N.	ESH3-Z5	R&S	827246/008	2006. 2. 21.	x
	ESH3-Z5	R&S	100028	2005. 11.11.	x
Shield room	8.0 m L × 6.0 m W × 3.3 m H	-	-	-	x

5.1.4 Test results

Date of test: May 13, 2005

The overview measurements performed with a peak detector & an average detector are included in the report.

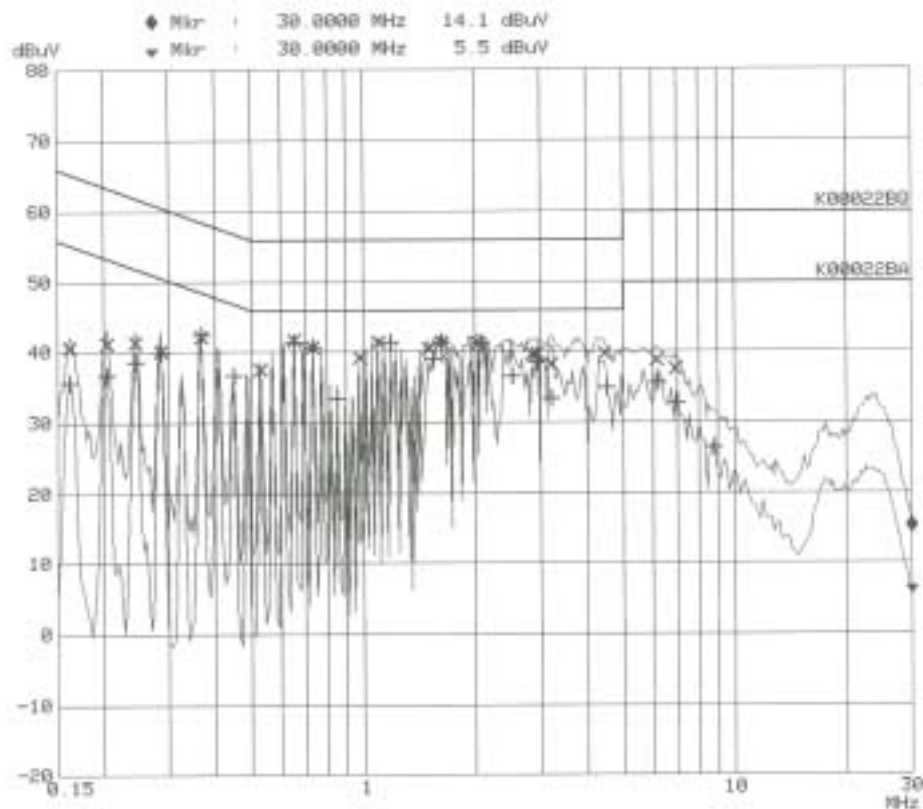
CONTINUOUS DISTURBANCE VOLTAGE External DVD R/RW drive

EUT: SE-W164
Manuf: TSST
Op Cond: Live
Operator: Kim, young-sik
Test Spec: KN22
Comment: E05-0176
Date: 13. May 05 17:11

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	3M	3k	10k	PK+AV	5ms	AUTO	LN ON	60dB
3M	30M	10k	10k	PK+AV	5ms	AUTO	LN ON	60dB

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 25dB



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Frequency MHz	QP Level dBuV	QP Limit dBuV
0.16200	40.7	65.4
0.20400	41.2	63.4
0.24300	41.3	62.0
0.28500	40.2	60.7
0.36600	42.1	58.6
0.52800	37.5	56.0
0.65100	41.6	56.0
0.73200	40.7	56.0
0.97500	39.2	56.0
1.09800	41.3	56.0
1.50300	40.4	56.0
1.62600	41.4	56.0
2.03400	41.2	56.0
2.84700	39.5	56.0
2.92500	39.7	56.0
3.21000	38.2	56.0
4.47000	39.7	56.0
6.18000	38.7	60.0
6.91000	37.5	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.16200	35.7	55.4
0.20400	36.9	53.4
0.24300	38.6	52.0
0.28500	39.9	50.7
0.36600	42.4	48.6
0.44700	36.7	46.9
0.65100	41.4	46.0
0.73200	40.7	46.0
0.85200	33.4	46.0
1.17900	41.3	46.0
1.54200	39.0	46.0
1.62600	41.4	46.0
2.07300	41.2	46.0
2.52000	36.6	46.0
2.92800	38.5	46.0
3.21000	33.4	46.0
4.51000	34.9	46.0
6.22000	35.6	50.0
6.95000	32.7	50.0
8.78000	26.5	50.0

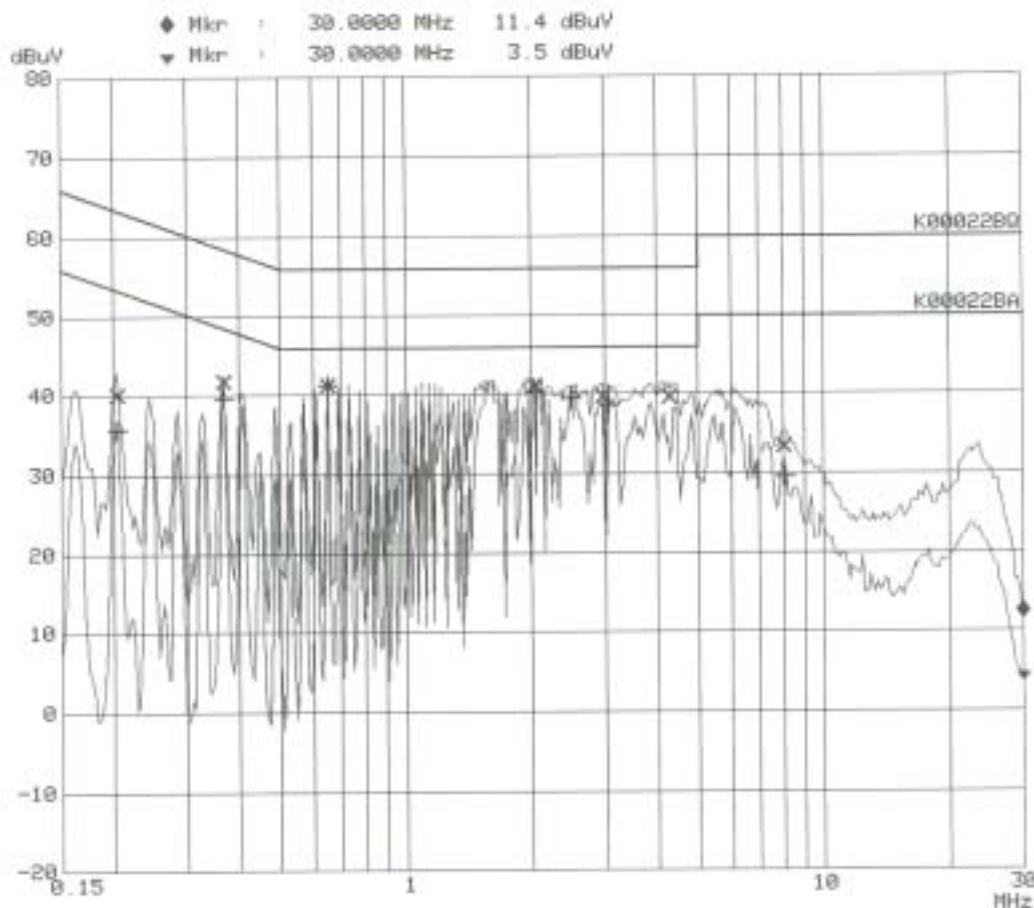
CONTINUOUS DISTURBANCE VOLTAGE External DVD R/RW drive

EUT: SE-W164
Manuf: TSST
Op Cond: Neutral
Operator: Kim, young-sik
Test Spec: KN22
Comment: E05-D176
Date: 13. May 05 17:03

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	3M	3k	10k	PK+AV	5ms	AUTO	LN ON	60dB
3M	30M	10k	10k	PK+AV	5ms	AUTO	LN ON	60dB

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 8
Acc Margin: 25dB



Frequency MHz	QP Level dBuV	QP Limit dBuV
0.20400	40.2	63.4
0.36600	41.7	58.6
0.65100	41.3	56.0
2.03400	41.2	56.0
2.97000	39.7	56.0
4.27000	39.5	56.0
8.01000	33.4	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.20400	35.7	53.4
0.36600	39.6	48.6
0.65100	41.2	46.0
2.03400	40.1	46.0
2.48100	39.5	46.0
3.05000	38.6	46.0
8.05000	29.5	50.0

Result: Pass

The measured emission levels of the EUT have found the below of the specified limit.

5.2 RADIATED DISTURBANCE : Frequency range 30 MHz to 5 000 MHz

5.2.1 Operating environment

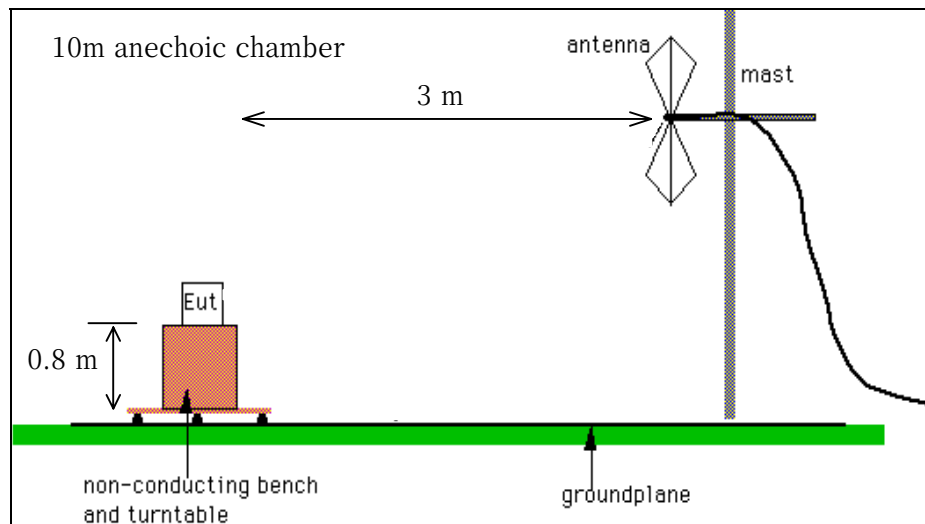
Temperature	: 19.0 ± 5 °C
Relative Humidity	: 39.0 ± 5 %
Atmospheric pressure	: 1000 ± 5 mbar

5.2.2 Test set-up

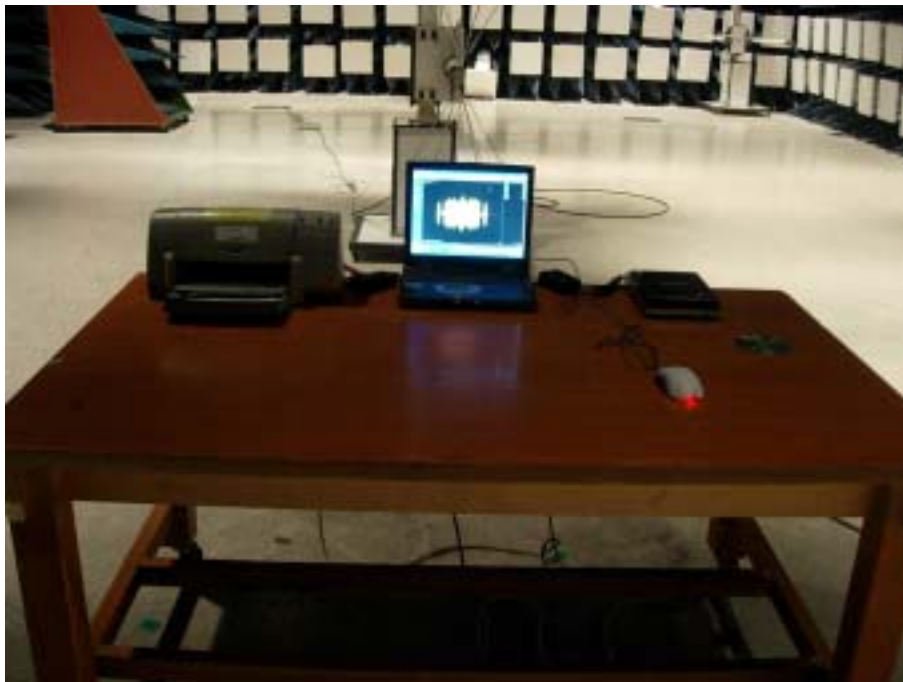
The frequency range investigated was 30 MHz to 1000 MHz.

All data results were a quasi-peak unless stated otherwise; a Biconical & a Log-periodic antenna were tuned to the frequency during Preliminary radiated measurements. The EUT, support equipment and interconnected cables were re-configured to produce the Maximum emission for the frequency and were placed on top of a 0.8 meter A High non-metallic 1 X 1.5 meter table. the EUT, the support equipment, and interconnecting cables were re-arranged and manipulated to maximize each a EME emission.

The turntable containing the system was rotated and the antenna height was varied 1 to 4 meters and stopped at the azimuth and the height producing the maximum emission. And this device (EUT) was tested in 3 orthogonal planes. The antenna measured both horizontal and vertical polarization.



<General test set-up for radiated emissions>



Radiated Disturbance(30 MHz – 1 000 MHz)



Radiated Disturbance(1 GHz – 5 GHz)

5.2.3 Test Conditions

DVD R/RW & DVD play mode

5.2.4 Test instrument

Instrument	Model No.	Serial No.	Makers	Next cal.date	Used
Test receiver	ESCS30	100021	R&S	2006. 2. 6	x
Biconical Antenna	VHA9103	91031950	Schwarzbeck	2006. 2. 4	x
Log-Periodic Antenna	UHALP9108A	0392	Schwarzbeck	2006. 2. 4	x
Antenna Mast	MA240	N/A	HD	-	x
Turn Table	DT430S	N/A	HD	-	x
Test receiver	ESCS30	100021	R&S	2006. 2. 6	x
Horn Antenna	3115	9811-5606	“	2005. 12. 20	
ERI lab	-	-	-	-	x
Test Receiver	ESMI	826210/007	R&S	2007. 01. 27.	x

5.2.5 Test results

Date of test: May 13, 2005

Tested Frequency [MHz]	ANT Pol.	Meter Reading [dBuV]	Antenna Factor [dB/m]	Cable Loss [dB]	Results [dBuV/m]	Limits [dBuV/m]
60.37	V	27.70	2.50	7.70	36.80	40.00
124.50	H	13.12	1.00	13.66	28.80	43.50
199.42	H	19.32	2.50	16.18	38.00	43.50
546.75	H	18.71	2.40	17.70	40.56	46.00
746.25	V	15.93	2.20	20.50	41.33	46.00
1024.00	H	11.81(PK)	2.20	23.44	40.85	54.00
1149.00	H	14.24(PK)	2.20	23.44	43.28	54.00

- Receiving Antenna Polarization : **Horizontal, Vertical**
- Test site : **10m anechoic chamber**

Note : ANT Polarization H : Horizontal V : Vertical

Result: Pass

The measured emissions level of the EUT have found the below of the specified limit.

6. PRODUCT PHOTOGRAPHS

6.1 Front Photograph of EUT



6.2 Rear Photograph of EUT



6.3 Inner Photograph of EUT