

APPLICATION FOR CERTIFICATION
On Behalf of
LITE-ON IT Corp.
CD-RW DRIVE
Model : AI-481648B

FCC ID: PPQRW1005

Prepared for : LITE-ON IT Corp.
6F., 16, Sec. 4, Nanking E. Rd.,
Taipei, Taiwan, R.O.C.

Prepared By : Taiwan Tokin EMC Eng. Corp.
No. 53-11, Tin-Fu Tsun, Lin-Kou,
Taipei Hsien, Taiwan, R.O.C.

Tel : (02) 2609-9301, 2609-2133

File Number : ATM-G91481R2
Report Number : TTEMC-F91088
Date of Test : May 21 ~ 22, 2002
Date of Report : Jun. 20, 2002

TABLE OF CONTENTS

<u>Description</u>	<u>Page</u>
Test Report for FCC Compliance Declaration	3
1. GENERAL INFORMATION	4
1.1. Description of Device (EUT)	4
1.2. Tested Supporting System Details	4
1.3. Description of Test Facility.....	7
1.4. Measurement Uncertainty	7
2. POWERLINE CONDUCTED TEST	8
2.1. Test Equipment	8
2.2. Block Diagram of Test Setup.....	8
2.3. Powerline Conducted Emission Limit (CLSPR 22 CLASS B).....	8
2.4. EUT's Configuration during Compliance Measurement	9
2.5. Operating Condition of EUT.....	9
2.6. Test Procedure.....	9
2.7. Test Results	10
3. RADIATED EMISSION TEST	17
3.1. Test Equipment	17
3.2. Block Diagram of Test Setup.....	17
3.3. Radiation Limit (CLSPR 22 CLASS B)	18
3.4. EUT's Configuration during Compliance Measurement	18
3.5. Operating Condition of EUT.....	18
3.6. Test Procedure.....	19
3.7. Test Results	19
3.8. Radiated Emission Measurement Results	20
4. DEVIATION TO TEST SPECIFICATIONS.....	24
5. PHOTOGRAPHS	25
5.1. Photos of Powerline Conducted Measurement	25
5.2. Photos of Radiated Measurement at Open Field Test Site (30~1000MHz).....	26
5.3. Photos of Radiated Measurement at Open Field Test Site (1~7GHz)	28

TEST REPORT CERTIFICATION

Measurement Procedure Used :

FCC RULES AND CISPR 22 (DOCKET NO. 92-152, SEP. 1993) AND
FCC / ANSI C63.4-1992 (FCC Part 15/2001 and CISPR 22/1997)

The device described above was tested by TAIWAN TOKIN EMC ENG. CORP. to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the CISPR 22 Class B limits both radiated and conducted emissions and above 1000MHz compared to the FCC Part 15 Subject B radiated limit.

The measurement results are contained in this test report and TAIWAN TOKIN EMC ENG. CORP. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Taiwan Tokin EMC Eng. corp.

Date of Test : May 21~22, 2002

Prepared by : Julie Hsu Jan 21, 2022
(Julie Hsu/Assistant Officer)

Test Engineer : Ben Cheng / 1200
(Ben Cheng / Supervisor)

Approve & Authorized Signer : Jackie Deng / Assistant General Manager

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description : CD-RW DRIVE

Model Number : AI-481648B

FCC ID : PPQRW1005

Brand Name : TDK

Applicant : LITE-ON IT Corp.
6F., 16, Sec. 4, Nanking E. Rd., Taipei, Taiwan,
R.O.C.

Manufacturer #1 : LITE-ON IT Corp.
3F., 60, Park Avenue. II, Hsinchu Science-Based
Ind. Park, Hsinchu City, Taiwan, R.O.C.

Manufacturer #2 : LITE-ON Electronic Technology (HK) Co., Ltd.
N., San Heng Rd., Heng Jiao Ind. Zone, Xi Chen
Zone, Shi Jie Town, Dong Guan City Guang
Dong Province, China

Data of Receipt of Sample : May 21, 2002

Date of Test : May 21 ~ 22, 2002

1.2. Tested Supporting System Details

1.2.1. PERSONAL COMPUTER

Model Number : HP VECTRA XE320

Serial Number : SG21102000

FCC ID : By DoC

BSMI ID : 3912A318

Brand : HP

Manufacturer : First International Computer, Inc.

CD-RW DRIVE (EUT) : **TDK, M/N AI-481648B**

Power Cord : Non-Shielded, Detachable, 1.8m

1.2.2. 15" LCD MONITOR

Model Number	:	D5063
Serial Number	:	CN206A6013
FCC ID	:	ARSLM562H
BSMI ID	:	R33037
Manufacturer	:	Top Victory Electronics (Fujian) Co., Ltd. (Brand: HP)
Data Cable (D-Sub)	:	Shielded, Detachable, 1.8m Bonded two ferrite cores
Audio Cable (*2EA)	:	Non-Shielded, Detachable, 1.2m
AC Adapter	:	Delta, M/N ADP-40TB BSMI ID 3892D142 Cord: Shielded, Undetachable, 1.8m Bonded a ferrite core
Power Cord	:	Non-Shielded, Detachable, 1.8m

1.2.3. PRINTER

Model Number	:	KX-P2135
Serial Number	:	8DMCNC02139
BSMI ID	:	3872A371
FCC ID	:	ACJ5Z6KX-P2135
Manufacturer	:	Panasonic
Data Cable	:	Non-Shielded, Detachable, 1.8m
Power Cord	:	Non-Shielded, Undetachable, 1.8m

1.2.4. KEYBOARD

Model Number	:	SK-2502C
Serial Number	:	M020235982
BSMI ID	:	3872F107
FCC ID	:	by DoC
Manufacturer	:	Siltek (Brand: HP)
Data Cable	:	Shielded, Undetachable, 1.8m

1.2.5. MODEM #1

Model Number	:	DM-1414
Serial Number	:	980034395
FCC ID	:	IFAXDM1414
Manufacturer	:	AcceX
Data Cable	:	Shielded, Detachable, 1.2m
Power Adapter	:	Amigo, M/N AM-91000A Non-Shielded, Undetachable, 1.8m

1.2.6. MODEM #2

Model Number	:	DM-1414
Serial Number	:	980034392
FCC ID	:	IFAXDM1414
Manufacturer	:	Accex
Data Cable	:	Shielded, Detachable, 1.2m
Power Adapter	:	Amigo, M/N AM-91000A Non-Shielded, Undetachable, 1.8m

1.2.7. PS2 MOUSE

Model Number	:	M-S48a
Serial Number	:	LZE20501511
FCC ID	:	JNZ201213
BSMI ID	:	4882A001
Manufacturer	:	Logitech (Brand: HP)
Data Cable	:	Non-Shielded, Undetachable, 1.8m

1.2.8. USB MOUSE #1

Model Number	:	CREUBB
Serial Number	:	N/A
FCC ID	:	NHM-CREUBE
Manufacturer	:	CRE Technology Co., Ltd.
Data Cable	:	Shielded, Undetachable, 1.8m

1.2.9. USB MOUSE #2

Model Number	:	CREUBB
Serial Number	:	N/A
FCC ID	:	NHM-CREUBE
Manufacturer	:	CRE Technology Co., Ltd.
Data Cable	:	Shielded, Undetachable, 1.8m

1.2.10. MICROPHONE

Model Number	:	HD-303
Serial Number	:	N/A
Manufacturer	:	Multimedia Microphone System
Data Cable	:	Non-Shielded, Undetachable, 2.2m

1.2.11. WALKMAN

Model Number	:	RQ-P35LT-K
Serial Number	:	HA08562
Manufacturer	:	Panasonic
Data Cable	:	Non-Shielded, Detachable, 1.8m

1.2.12. EARPHONE #1

Model Number	:	N/A
Manufacturer	:	Panasonic
Earphone Cable	:	Non-Shielded, Undetachable, 1.1m

1.2.13. EARPHONE #2 (Link to EUT)

Model Number : N/A
 Manufacturer : Panasonic
 Earphone Cable : Non-Shielded, Undetachable, 1.1m

1.2.14. HUB

Model Number : 8222-008
 Serial Number : 23-F4014
 FCC ID : by DoC
 Manufacturer : IBM
 Data Cable : Non-Shielded, Detachable, 1.5m
 Power Cord : Non-Shielded, Detachable, 1.8m

1.3. Description of Test Facility

Site Description : Dec. 02, 1999 File on
 (No. 7 Open Site) Federal Communication Commission
 Registration Number: 96132

Name of Firm : Taiwan Tokin EMC Eng. Corp.

Site Location : No. 53-11, Tin-Fu Tsun, Lin-Kou,
 Taipei Hsien, Taiwan, R.O.C.

NVLAP Lab Code : 200077-0
 (NVLAP is a NATA accredited body under Mutual Recognition Agreement)

1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Conduction Test	150KHz~30MHz	±2.66dB
Radiation Test (Distance: 10m)	30MHz~300MHz	+4.5dB / -4.5dB
	300MHz~1000MHz	+3.88dB / -3.84dB

Remark : Uncertainty = K_{μc}(y)

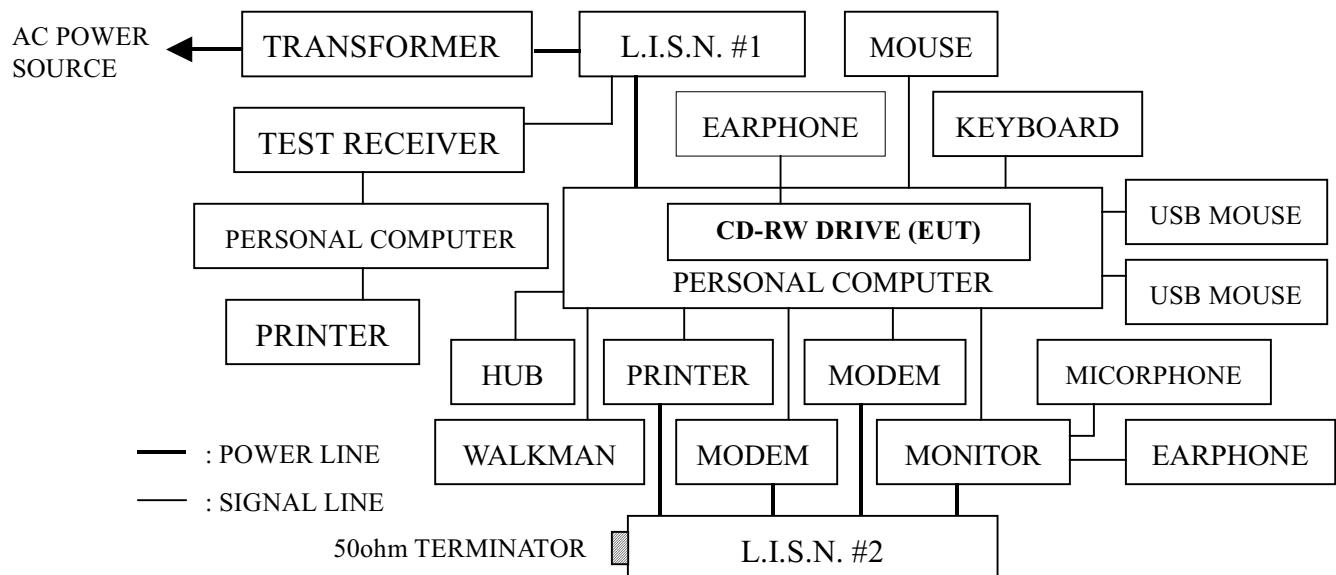
2. POWERLINE CONDUCTED TEST

2.1. Test Equipment

The following test equipments are used during the power line conducted tests :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS 30	825442/020	Jun.29, 01'	1 Year
2.	L.I.S.N. # 1	Kyoritsu	KNW-407	8-1370-10	May 28, 01'	1 Year
3.	L.I.S.N. # 2	Kyoritsu	KNW-407	8-1370-9	May 28, 01'	1 Year

2.2. Block Diagram of Test Setup



2.3. Powerline Conducted Emission Limit (CLSPR 22 CLASS B)

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level	Average Level
150KHz ~ 500KHz	66 ~ 56 dB	56 ~ 46 dB
500KHz ~ 5MHz	56 dB	46 dB
5MHz ~ 30MHz	60 dB	50 dB

* If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

2.4. EUT's Configuration during Compliance Measurement

The following equipments are installed on RF LINE VOLTAGE measurement to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

2.4.1. CD-RW DRIVE (EUT)

Model Number	:	AI-481648B
Brand Name	:	TDK
Manufacturer #1	:	LITE-ON IT Corp.
Manufacturer #2	:	LITE-ON Electronic Technology (HK) Co., Ltd.

2.4.2. Support Simulators

:

As in section 1.2.

2.5. Operating Condition of EUT

- 2.5.1. Setup the EUT and simulator as shown on 2.2.
- 2.5.2. Turned on the power of all equipments.
- 2.5.3. Data Read Mode: The personal computer sent "H" character to monitor through EUT (CD-RW DRIVE). The EUT was running self-test software "H" by MS-DOS during all testing.
- 2.5.4. Data Write Mode: The personal computer "Word, Excel, file" to EUT (CD-RW DRIVE) through "Nero 5.5.8.2." program. The EUT wrote down the Word, Excel, file during all testing.
- 2.5.5. Audio Play Mode: The EUT (CD-RW DRIVE) was played a CD-Disk and send the sound to earphone and speaker.
- 2.5.6. The other peripheral devices were drove and operated in turn during all testing.
- 2.5.7. Repeat above procedure from 2.5.3. to 2.5.6.

2.6. Test Procedure

The EUT (within PC) was connected to the power mains through a line impedance stabilization network (L.I.S.N. #1) and the other peripheral devices power cord were connected to the power mains through a line impedance stabilization network (L.I.S.N. #2) This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to FCC ANSI C63.4-1992 on conducted measurement.

The bandwidth of R&S Test Receiver ESCS 30 was set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

All the test results are listed in section 2.7.

2.7. Test Results

PASSED. Three kinds of test modes were done during conducted measurement and all the test results are listed in the following pages. (6 Page)

Test Date : Jan. 19, 2002 Temperature : 18.9°C Humidity : 66%

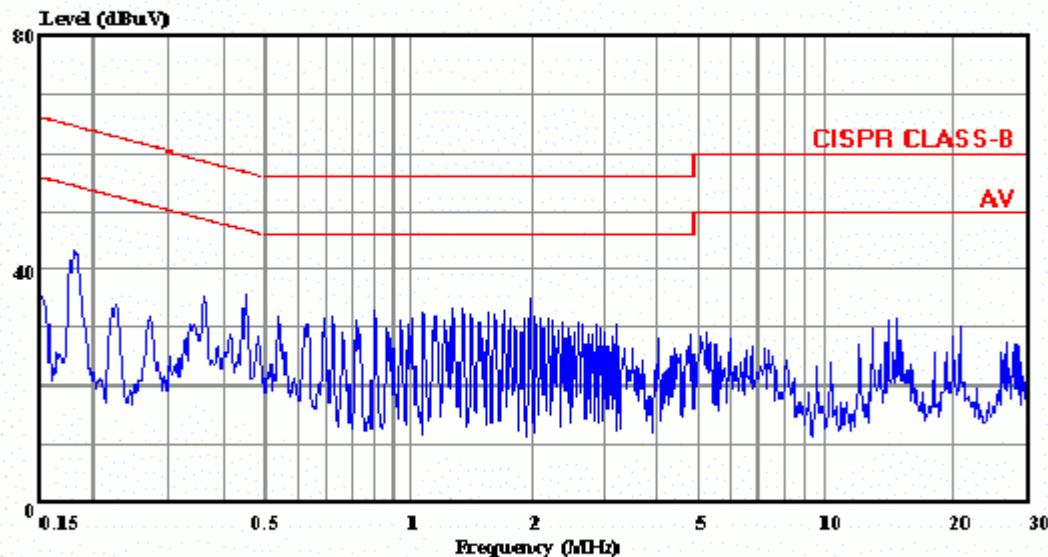
No.	Mode	Reference Data #
1.	Data Read	25 (26) 27 (28)
2.	Data Write	31 (32) 29 (30)
3.	Audio Play	33 (34) 35 (36)

TOKINTAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 25

File#: Lite-on-3.emi

Date: 2002-05-21 Time: 21:42:15



Site : No.3 Shielded room
 Condition: CISPR CLASS-B KNW-407 NEUTRAL
 EUT : CD-RW DRIVE M/N:AI-481648B
 Power : 120Vac/60Hz
 Memo : READ

TOKINTAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 26

File#: D:\Lite-on-3.emi

Date: 2002-05-21 Time: 21:43:13

Site : No.3 Shielded room
 Condition : CISPR CLASS-B KNW-407 NEUTRAL
 EUT : CD-RW DRIVE M/N:AI-481648B
 Power : 120Vac/60Hz
 Memo : READ

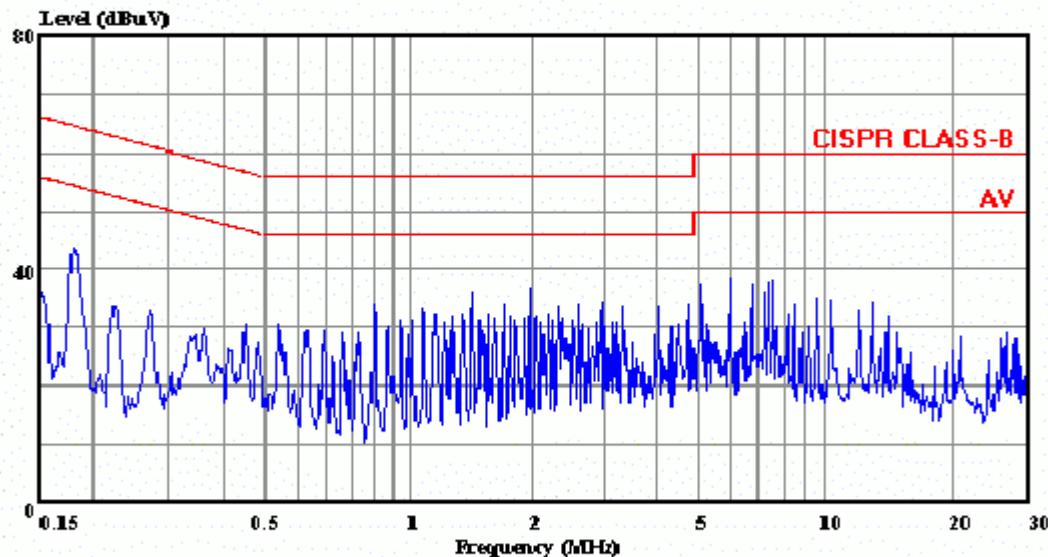
Freq	Level	Over	Limit	Read	Probe	Cable
		Line	dBuV	Level	Factor	Loss
MHz	dBuV	dB	dBuV	dBuV	dB	dB
1	0.182	39.61	-24.76	64.37	39.01	0.40
2	0.226	30.64	-31.97	62.61	30.24	0.20
3	0.273	27.96	-33.07	61.03	27.56	0.20
4	0.361	30.83	-27.86	58.69	30.43	0.20
5	2.077	31.93	-24.07	56.00	31.13	0.40
6	14.986	28.61	-31.39	60.00	27.11	0.70

TOKINTAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 27

File#: Lite-on-3.emi

Date: 2002-05-21 Time: 21:43:24



Site : No.3 Shielded room

Condition: CISPR CLASS-B KNW-407 LINE

EUT : CD-RW DRIVE M/N:AI-481648B

Power : 120Vac/60Hz

Memo : READ

TOKINTAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 28

File#: D:\Lite-on-3.emi

Date: 2002-05-21 Time: 21:44:22

Site : No.3 Shielded room

Condition : CISPR CLASS-B KNW-407 LINE

EUT : CD-RW DRIVE M/N:AI-481648B

Power : 120Vac/60Hz

Memo : READ

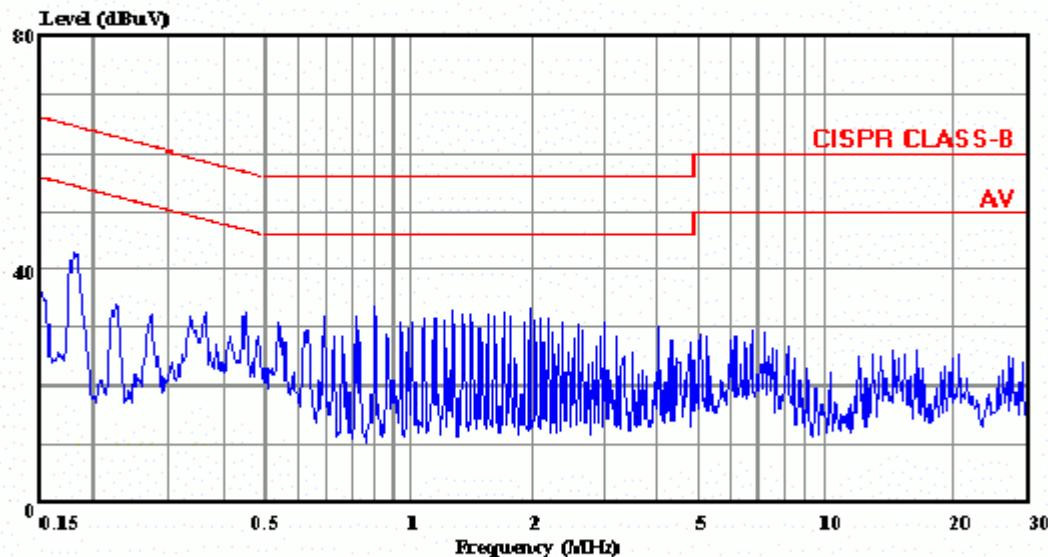
Freq	Level	Over	Limit	Read	Probe	Cable
		Line	Line	Level	Factor	Loss
MHz	dBuV	dB	dBuV	dBuV	dB	dB
1	0.182	42.58	-21.79	64.37	41.98	0.40
2	0.226	33.27	-29.34	62.61	32.87	0.20
3	0.273	32.09	-28.94	61.03	31.69	0.20
4	0.452	30.27	-26.58	56.85	29.67	0.40
5	0.899	33.84	-22.16	56.00	33.24	0.40
6	7.687	38.03	-21.97	60.00	36.93	0.50

TOKINTAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 31

File#: Lite-on-3.emi

Date: 2002-05-21 Time: 21:48:33



Site : No.3 Shielded room

Condition: CISPR CLASS-B KMW-407 NEUTRAL

EUT : CD-RW DRIVE M/N:AI-481648B

Power : 120Vac/60Hz

Memo : WRITE

TOKINTAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 32

File#: D:\Lite-on-3.emi

Date: 2002-05-21 Time: 21:49:59

Site : No.3 Shielded room

Condition : CISPR CLASS-B KMW-407 NEUTRAL

EUT : CD-RW DRIVE M/N:AI-481648B

Power : 120Vac/60Hz

Memo : WRITE

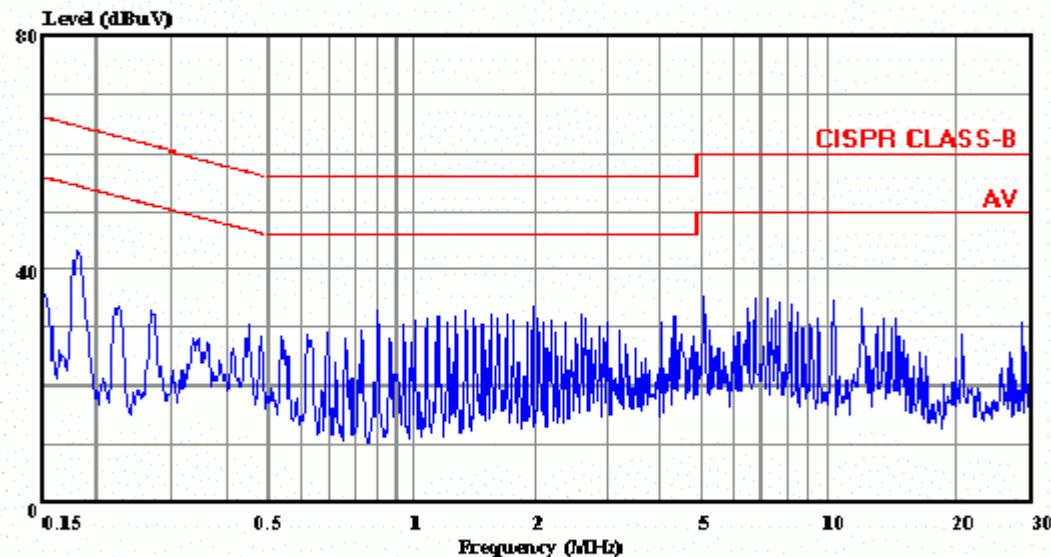
Freq	Level	Over	Limit	Read	Probe	Cable
		Line	dBuV	Level	Factor	Loss
MHz	dBuV	dB		dBuV	dB	
1	0.154	32.71	-33.07	65.78	32.11	0.40
2	0.182	39.65	-24.72	64.37	39.05	0.40
3	0.226	30.74	-31.87	62.61	30.34	0.20
4	0.452	28.68	-28.17	56.85	28.08	0.40
5	0.899	30.58	-25.42	56.00	29.98	0.40
6	6.121	25.87	-34.13	60.00	24.77	0.50
						QP
						QP
						QP
						QP
						QP
						QP

TOKINTAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 29

File#: Lite-on-3.emi

Date: 2002-05-21 Time: 21:44:39



Site : No.3 Shielded room

Condition: CISPR CLASS-B KNW-407 LINE

EUT : CD-RW DRIVE M/N:AI-481648B

Power : 120Vac/60Hz

Memo : WRITE

TOKINTAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 30

File#: D:\Lite-on-3.emi

Date: 2002-05-21 Time: 21:47:21

Site : No.3 Shielded room

Condition : CISPR CLASS-B KNW-407 LINE

EUT : CD-RW DRIVE M/N:AI-481648B

Power : 120Vac/60Hz

Memo : WRITE

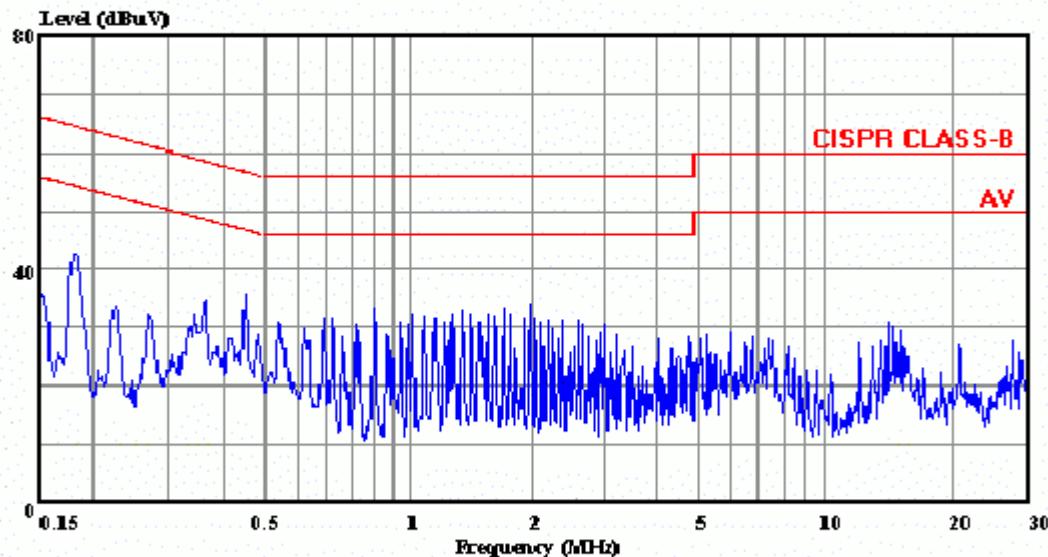
Freq	Level	Over	Limit	Read	Probe	Cable		
		MHz	dBuV	dB	dBuV	dBuV	dB	Loss
1	0.182	38.92	-25.45	64.37	38.32	0.40	0.20	QP
2	0.226	30.29	-32.32	62.61	29.89	0.20	0.20	QP
3	0.274	28.39	-32.59	60.98	27.99	0.20	0.20	QP
4	0.452	26.26	-30.59	56.85	25.66	0.40	0.20	QP
5	0.899	30.80	-25.20	56.00	30.20	0.40	0.20	QP
6	10.397	30.35	-29.65	60.00	28.85	0.80	0.70	QP

TOKINTAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 33

File#: Lite-on-3.emi

Date: 2002-05-21 Time: 21:53:57



Site : No.3 Shielded room
 Condition: CISPR CLASS-B KMW-407 NEUTRAL
 EUT : CD-RW DRIVE M/N:AI-481648B
 Power : 120Vac/60Hz
 Memo : AUDIO PLAY

TOKINTAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 34

File#: D:\Lite-on-3.emi

Date: 2002-05-21 Time: 21:54:24

Site : No.3 Shielded room
 Condition : CISPR CLASS-B KMW-407 NEUTRAL
 EUT : CD-RW DRIVE M/N:AI-481648B
 Power : 120Vac/60Hz
 Memo : AUDIO PLAY

Freq	Level	Over Limit	Read Line	Probe Factor	Cable Loss		Remark
					MHz	dBuV	
1	0.183	38.64	-25.69	64.33	38.04	0.40	0.20 QP
2	0.274	26.53	-34.45	60.98	26.13	0.20	0.20 QP
3	0.452	31.86	-24.99	56.85	31.26	0.40	0.20 QP
4	0.690	27.56	-28.44	56.00	26.96	0.40	0.20 QP
5	1.662	29.20	-26.80	56.00	28.40	0.40	0.40 QP
6	6.878	25.29	-34.71	60.00	24.19	0.50	0.60 QP



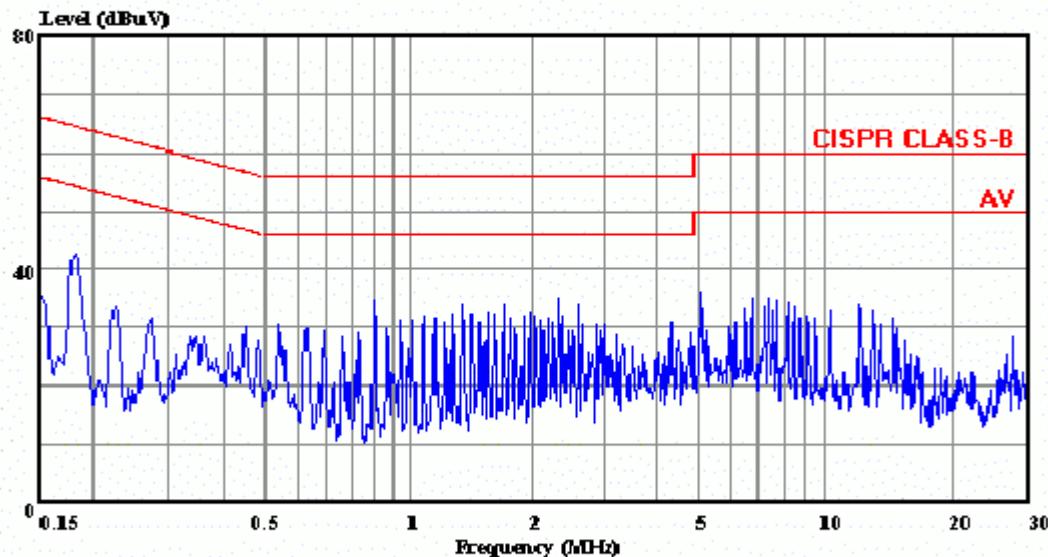
TAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司

No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 35

File#: Lite-on-3.emi

Date: 2002-05-21 Time: 21:54:37



Site : No.3 Shielded room
Condition: CISPR CLASS-B KNW-407 LINE
EUT : CD-RW DRIVE M/N:AI-481648B
Power : 120Vac/60Hz
Memo : AUDIO PLAY



TAIWAN TOKIN EMC ENG. CORP.
台灣東金科技股份有限公司

No.53-11, Tin-fu Tsun, Lin-kou Hsiang,
Taipei Country, Taiwan, R.O.C.
Tel:02-26092133 Fax:02-26099303
Email:ttemc@ttemc.com.tw

Data#: 36

File#: D:\Lite-on-3.emi

Date: 2002-05-21 Time: 21:55:42

Site : No.3 Shielded room
Condition : CISPR CLASS-B KNW-407 LINE
EUT : CD-RW DRIVE M/N:AI-481648B
Power : 120Vac/60Hz
Memo : AUDIO PLAY

Freq	Level	Over Limit	Read Line	Probe Factor	Cable Loss		Remark
					MHz	dBuV	
1	0.153	31.54	-34.28	65.82	30.94	0.40	0.20 QP
2	0.185	33.85	-30.39	64.24	33.25	0.40	0.20 QP
3	0.227	29.90	-32.67	62.57	29.50	0.20	0.20 QP
4	0.346	25.45	-33.60	59.05	25.05	0.20	0.20 QP
5	0.899	31.53	-24.47	56.00	30.93	0.40	0.20 QP
6	5.221	32.94	-27.06	60.00	31.84	0.50	0.60 QP

3. RADIATED EMISSION TEST

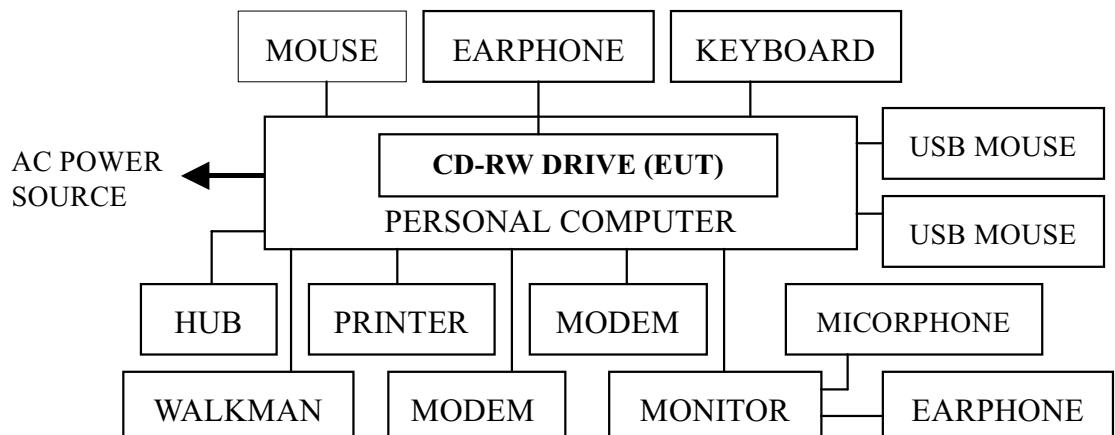
3.1. Test Equipment

The following test equipments are used during the radiated emission tests :

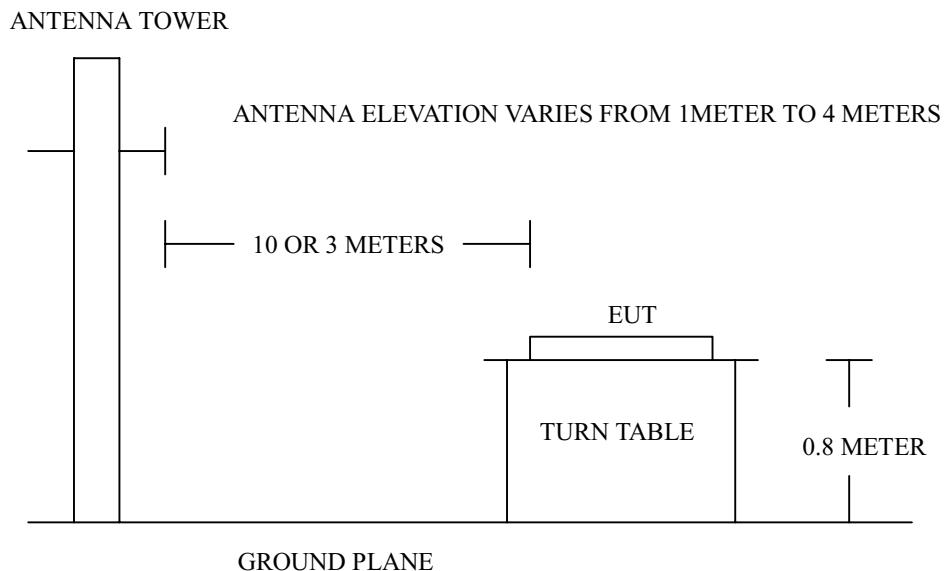
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	HP	8595E	3829A03489	Jan.24, 02'	1 Year
2.	Test Receiver	Rohde & Schwarz	ESVS10	826148/005	Jul.13, 01'	1 Year
3.	Amplifier	HP	8447D	2944A06891	N/A	N/A
4.	Broadband Antenna	Chase	VBA6106A	1258	Aug.13, 01'	1 Year
5.	Log Periodic Antenna	Chase	UPA6109	1064	Aug.13, 01'	1 Year
6.	Horn Antenna (1GHz ~ 7GHz)	EMCO	3115	9609-4927	Jul. 05, 01'	1 Year

3.2. Block Diagram of Test Setup

3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Open Field Test Site Setup Diagram (10M for 30MHz~ 1000MHz; 3M for 1GHz~7GHz)



3.3. Radiation Limit (CLSPR 22 CLASS B)

All emanations from a class B computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dB μ V/m)
30 ~ 230	10	30
230 ~ 1000	10	37
1000 ~ 7000	3	74.0 (Peak)

- Notes : (1) The tighter limit applies at the edge between two frequency bands.
 (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
 (3) There is no over 1GHz limit in CISPR 22 standard. Therefor, a FCC limit is used based on CFR 47 Part 15.35 (b) and Part 15.109 (g).

3.4. EUT's Configuration during Compliance Measurement

The configuration of EUT and its simulators are same as those used in conducted measurement. Please refer to 2.4.

3.5. Operating Condition of EUT

Same as conducted measurement which is listed in 2.5.

3.6. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. For 30MHz to 1000MHz frequency ranges, EUT was set 10 meters and for 1GHz to 7GHz frequency ranges, EUT was set at 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters for 30MHz to 1000MHz frequency range and for 1GHz to 7GHz frequency range to find out the maximum emission level. Broadband antenna such as calibrated biconical and log- periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4-1992 regulation.

The resolution bandwidth from band 30MHz ~ 1000MHz was set at 120KHz and from 1GHz ~ 7GHz was set at 1MHz.

The frequency range from 30MHz to 7GHz was checked.

Three kinds of test modes were done during 30MHz~1000MHz frequency range radiated measurement and all the test results are listed in section 3.8.1.

- (1) Data Read
- (2) Data Write
- (3) Audio Play

The test modes (3)Audio Play was done during 1GHz~7GHz frequency range radiated measurement and all the test results are listed in section 3.8.2.

3.7. Test Results

PASSED. Please refer to the following pages.

3.8. Radiated Emission Measurement Results

3.8.1. 30MHz to 1000GHz Frequency Range Measurement Results

Distance: 10Meters

All emissions not report below are too low against the prescribed limits.

Date of Test : May 21, 2002 Temperature : 23.5°C

EUT : CD-RW DRIVE Humidity : 70 %

Test Mode : Data Read

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBuV	Emission Level Horizontal dBuV/m	Limits dBuV/m	Margin dB
67.786	12.97	1.91	- 1.59	13.29	30.00	16.71
135.536	20.66	2.79	- 2.34	21.11	30.00	8.89
169.414	22.66	3.11	- 3.20	22.57	30.00	7.43
215.992	23.01	3.57	- 2.82	23.76	30.00	6.24
271.040	26.23	3.99	- 1.01	29.21	37.00	7.79
338.814	14.79	4.62	- 0.21	19.20	37.00	17.80
406.549	15.90	5.24	- 1.91	19.23	37.00	17.77
474.305	16.89	5.93	0.70	23.52	37.00	13.48
542.046	18.97	6.36	- 2.85	22.48	37.00	14.52
643.667	20.33	7.58	- 2.20	25.71	37.00	11.29

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBuV	Emission Level Vertical dBuV/m	Limits dBuV/m	Margin dB
33.899	22.98	1.32	- 4.17	20.13	30.00	9.87
67.786	14.14	1.91	- 0.76	15.29	30.00	14.71
135.536	20.45	2.79	- 2.13	21.11	30.00	8.89
169.414	22.82	3.11	- 3.36	22.57	30.00	7.43
215.992	23.43	3.57	- 3.24	23.76	30.00	6.24
271.040	24.08	3.99	1.14	29.21	37.00	7.79
338.782	16.55	4.61	0.90	22.06	37.00	14.94
406.537	16.96	5.24	- 1.81	20.39	37.00	16.61
474.289	18.05	5.93	- 1.28	22.70	37.00	14.30
542.041	19.14	6.36	- 2.72	22.78	37.00	14.22
643.670	20.52	7.58	- 2.05	26.05	37.00	10.95

Remark : All reading are Quasi-Peak values.

Date of Test : May 21, 2002 Temperature : 23.5°C

EUT : CD-RW DRIVE Humidity : 70 %

Test Mode : Data Write

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBuV	Emission Level Horizontal dBuV/m	Limits dBuV/m	Margin dB
67.785	12.97	1.91	- 1.49	13.39	30.00	16.61
135.539	20.66	2.79	- 3.31	20.14	30.00	9.86
169.414	22.66	3.11	- 3.21	22.56	30.00	7.44
* 215.991	23.01	3.57	- 1.84	24.74	30.00	5.26
271.040	26.23	3.99	- 2.09	28.13	37.00	8.87
338.801	14.79	4.62	0.94	20.35	37.00	16.65
406.551	15.90	5.24	- 1.07	20.07	37.00	16.93
474.301	16.89	5.93	1.80	24.62	37.00	12.38
542.050	18.97	6.36	- 2.41	22.92	37.00	14.08
643.674	20.33	7.58	- 2.69	25.22	37.00	11.78

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBuV	Emission Level Vertical dBuV/m	Limits dBuV/m	Margin dB
33.910	22.98	1.32	- 4.26	20.04	30.00	9.96
67.786	14.14	1.91	- 0.35	15.70	30.00	14.30
135.538	20.45	2.79	- 1.80	21.44	30.00	8.56
160.945	21.93	3.04	- 2.04	22.93	30.00	7.07
* 215.995	23.43	3.57	2.22	24.78	30.00	5.22
228.666	23.10	3.69	- 2.81	23.98	30.00	6.02
271.013	24.08	3.99	1.22	29.29	37.00	7.71
338.792	16.56	4.62	1.78	22.96	37.00	14.04
406.542	16.96	5.24	- 2.13	20.07	37.00	16.93
474.296	18.05	5.93	- 1.03	22.95	37.00	14.05
542.046	19.14	6.36	- 2.41	23.09	37.00	13.91
643.675	20.52	7.58	- 2.70	25.40	37.00	11.60

- Remark : 1. All reading are Quasi-Peak values.
2. The worst emission is detected at 215.991MHz with corrected signal level of 24.74dBuV/m (limit is 30dBuV/m) when the antenna is at horizontal polarization and is at 4m high and the turn table is at 315° .
3. The worst emission is detected at 215.995MHz with corrected signal level of 24.78dBuV/m (limit is 30dBuV/m) when the antenna is at vertical polarization and is at 1m high and the turn table is at 45° .
4. 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

Date of Test : May 21, 2002 Temperature : 23.5°C

EUT : CD-RW DRIVE Humidity : 70 %

Test Mode : Audio Play

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Horizontal dBuV	Emission Level Horizontal dBuV/m	Limits dBuV/m	Margin dB
67.780	12.96	1.91	- 4.57	10.30	30.00	19.70
135.516	20.66	2.79	- 3.85	19.60	30.00	10.40
169.396	22.66	3.11	- 3.76	22.01	30.00	7.99
215.989	23.01	3.57	- 3.32	23.26	30.00	6.74
271.055	26.23	3.99	- 0.35	29.87	37.00	7.13
338.841	14.79	4.62	- 1.20	18.21	37.00	18.79
406.585	15.90	5.24	- 1.10	20.04	37.00	16.96
474.333	16.89	5.93	0.84	23.66	37.00	13.34
542.097	18.97	6.36	- 2.68	22.65	37.00	14.35
643.703	20.33	7.58	- 2.66	25.25	37.00	11.75

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading Vertical dBuV	Emission Level Vertical dBuV/m	Limits dBuV/m	Margin dB
33.914	22.98	1.32	- 5.19	19.11	30.00	10.89
67.814	14.14	1.91	- 0.26	15.79	30.00	14.21
135.558	20.47	2.79	- 3.78	19.48	30.00	10.52
169.434	22.82	3.11	- 3.81	22.12	30.00	7.88
216.013	23.43	3.57	- 3.53	23.47	30.00	6.53
271.055	24.08	3.99	0.75	28.82	37.00	8.18
338.812	16.56	4.62	0.83	22.01	37.00	14.99
406.565	16.96	5.24	- 2.07	20.13	37.00	16.87
474.316	18.05	5.93	- 1.31	22.67	37.00	14.33
542.076	19.14	6.36	- 2.56	22.94	37.00	14.06
643.708	20.52	7.58	- 2.49	25.61	37.00	11.39

Remark : All reading are Quasi-Peak values.

3.8.2. 1GHz ~ 7GHz Frequency Range Measurement Results

Distance: 3Meters

The emissions not report below are too low against the FCC official limits.

Date of Test :	May 22, 2002	Temperature :	28.5°C
EUT :	CD-RW DRIVE	Humidity :	51 %
Test Mode :	Audio Play		

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Pre-Amp Factor dB	Meter Reading Horizontal dBµV	Emission Level Horizontal dBµV/m	(Peak) Limits dBµV/m	Margin dB
1075.400	24.83	4.24	32.49	51.65	48.23	74.00	25.77
1344.840	25.54	4.62	32.34	47.53	45.35	74.00	28.65
1614.280	26.12	5.12	32.21	44.43	43.47	74.00	30.53
1883.720	26.61	5.78	32.10	40.56	40.85	74.00	33.15
2153.160	27.49	6.15	32.11	40.12	41.65	74.00	32.35
2422.600	28.59	6.31	32.18	38.78	41.50	74.00	32.50
2692.040	29.57	6.80	32.25	38.66	42.78	74.00	31.22
2961.480	30.46	7.39	32.31	37.81	43.35	74.00	30.65
3500.360	31.61	7.80	32.33	37.15	44.23	74.00	29.77
4039.240	32.54	8.66	32.33	37.23	46.10	74.00	27.90
4578.120	33.10	9.15	32.39	37.22	47.07	74.00	26.93
5386.440	33.82	10.20	32.43	37.01	48.61	74.00	25.39
6464.020	34.55	11.45	32.56	36.74	50.17	74.00	23.83

Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Pre-Amp Factor dB	Meter Reading Vertical dBµV	Emission Level Vertical dBµV/m	(Peak) Limits dBµV/m	Margin dB
1077.700	24.84	4.25	32.49	52.04	48.64	74.00	25.36
1347.200	25.54	4.62	32.33	46.16	43.99	74.00	30.01
1616.150	26.12	5.12	32.21	44.61	43.65	74.00	30.35
1885.680	26.61	5.78	32.10	40.40	40.69	74.00	33.31
2155.080	27.49	6.15	32.11	43.60	45.13	74.00	28.87
2424.600	28.61	6.32	32.18	41.87	44.61	74.00	29.39
2694.000	29.60	6.82	32.25	40.58	44.74	74.00	29.26
2963.840	30.49	7.40	32.31	39.12	44.70	74.00	29.30
3233.280	31.09	7.64	32.32	38.45	44.86	74.00	29.14
3502.720	31.63	7.81	32.33	38.25	45.36	74.00	28.64
4580.480	33.10	9.16	32.39	37.34	47.21	74.00	26.79
5658.240	34.04	10.62	32.42	36.24	48.47	74.00	25.53
6736.000	34.68	11.48	32.64	35.86	49.38	74.00	24.62

Remark : 1. Measurement at No.7 Open Field Test Site test voltage 120V/60Hz.
 2. Emission Level = Antenna Factor + Cable Loss + Meter Reading – Pre-Amp Factor.

4. DEVIATION TO TEST SPECIFICATIONS

【NONE】