NVLAP Kashima

EMISSION TEST REPORT

Report File No. : **TR2-98243F** Issued date : June 29, 1998

Kind of Equipment : DVD-ROM DRIVE

Model : SD-M1202

Manufacturer : Toshiba Multi Media Devices Co., Ltd.

Applicant : Toshiba Corporation

Address : 1-1, Shibaura, 1-chome, Minato-ku, Tokyo
105-8001, Japan

EMC Kashima Corporation
1614, Mushihata, Omigawa-machi,
Katori-gun, Chiba-ken, 289-0341 Japan
TEL +81-478-82-0963 FAX +81-478-82-3373

CERTIFICATE

GENERAL REMARKS :

The radiated emission test was performed up to 2GHz in accordance with FCC Part15 § 15.33(b) as PICK-UP module highest frequency of the EUT was 250MHz, however, no noise appeared.

FINAL JUDGMENT :

The equipment under test, **DVD-ROM DRIVE, SD-M1202**

■ - **Fulfill(s)** the technical regulations mentioned on page 4.
□ - **Do(es) not** fulfill the technical regulations mentioned on page 4.

The test result only responds to the tested sample. The report shall not be reproduced except in full without the written approval of the laboratory. The report must not be used to claim products endorsement by NVLAP. The engineers of EMC Kashima Corporation were not involved in modification for the tested sample.

June 29, 1998
Issued date

EMC Kashima Corporation

Masaru Nakayama
President

Test engineer

Shinichi Deoka
Manager

CONTENTS

N/A : Not Applicable

TEST REGULATIONS

The tests were performed according to following regulations :

☐ - EN 50081-1 / 1992		
☐ - EN 50081-2 / 1993		
☐ - EN 55011 / 1991 / A2:1997	☐ - Group 1 ☐ - Class A	☐ - Group 2 ☐ - Class B
☐ - EN 55014-1 / 1993 / A1:1997	☐ - Household appliances and similar ☐ - Tools ☐ - Semiconductor devices	
☐ - EN 55022 / 1994 / A2:1997	☐ - Class A	☐ - Class B
☐ - EN 60601-1-2 / 1993		
☐ - EN 61000-3-2 / 1995	☐ - Class A ☐ - Class C	☐ - Class B ☐ - Class D
☐ - EN 61000-3-3 / 1995		
☐ - CISPR Pub. 11 / 1990 / A2:1996	☐ - Group 1 ☐ - Class A	☐ - Group 2 ☐ - Class B
☐ - CISPR Pub. 14-1 / 1993 / A1:1996	☐ - Household appliances and similar ☐ - Tools ☐ - Semiconductor devices	
☐ - CISPR Pub. 22 / 1993 / A2:1996	☐ - Class A	☐ - Class B
☐ - AS/NZS 3548 / 1995 / A2:1997	☐ - Class A	☐ - Class B
☐ - BS		
■ - FCC Part 15 Subpart B Test Method : ANSI C63.4-1992	☐ - Class A	■ - Class B
☐ - FCC Part 15 Subpart B according to 15.107(e), 15,109(g)		
☐ - FCC Part 18 Subpart C Test Method : FCC/OST MP-5 (1985)		
☐ - VCCI	☐ - Class A	☐ - Class B

TEST CONDITIONS

The measurement of **the conducted emissions (interference voltage)** was performed

■ - in a shielded enclosure.
□ - at a nonreflecting open site.

□ - Shielded room No. 1
■ - Shielded room No. 2
□ - Shielded room No. 4
□ - Open site No. 1
□ - Open site No. 2

Used test instruments :

Model	Name	Manufacturer	Code No.	Cal.date	Next cal.
□ - ESH2	Test Receiver	Rohde & Schwarz	RCH01	97.8	98.8
■ - ESHS10	Test Receiver	Rohde & Schwarz	RCH02	98.1	99.1
□ - ESPC	Test Receiver	Rohde & Schwarz	RCV03	97.9	98.9
□ - ESH2-Z5	LISN	Rohde & Schwarz	LSN01	98.4	99.4
□ - ESH3-Z5	LISN	Rohde & Schwarz	LSN02	98.3	99.3
□ - ESH3-Z5	LISN	Rohde & Schwarz	LSN03	98.1	99.1
■ - ESH3-Z5	LISN	Rohde & Schwarz	LSN06	98.4	99.4
■ - ESH3-Z5	LISN	Rohde & Schwarz	LSN07	98.3	99.3
□ - ESH3-Z5	LISN	Rohde & Schwarz	LSN08	97.7	98.7
□ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD01	98.6	99.6
□ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR01	98.6	99.6
□ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA01	97.12	98.12
■ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD02	98.3	99.3
■ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR02	98.3	99.3
■ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA02	98.1	99.1
□ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD03	97.9	98.9
□ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR03	97.9	98.9
□ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA03	97.9	98.9
□ - R3361B	Spectrum Analyzer	ADVANTEST	SPTG03	98.5	99.5

note : The LISN code no. LSN06 was connected to the EUT during the test.
All used test-instruments are calibrated at least once a year.

The measurement of **the radiated emissions (magnetic field)** was performed at a nonreflecting open site and test distance of:

☐ - Open site No. 1
☐ - Open site No. 2

☐ - 3 meters
☐ - 10 meters
☐ - 30 meters

Used test instruments :

Model	Name	Manufacturer	Code No.	Cal.date	Next cal.
☐ - ESH2	Test Receiver	Rohde & Schwarz	RCH01	97.8	98.8
☐ - ESHS10	Test Receiver	Rohde & Schwarz	RCH02	98.1	99.1
☐ - ESPC	Test Receiver	Rohde & Schwarz	RCV03	97.9	98.9
☐ - HFH2-Z2	Loop Antenna	Rohde & Schwarz	LPA01	98.5	99.5
☐ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD01	98.6	99.6
☐ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR01	98.6	99.6
☐ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA01	97.12	98.12
☐ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD02	98.3	99.3
☐ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR02	98.3	99.3
☐ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA02	98.1	99.1
☐ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD03	97.9	98.9
☐ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR03	97.9	98.9
☐ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA03	97.9	98.9
☐ - R3361B	Spectrum Analyzer	ADVANTEST	SPTG03	98.5	99.5
☐ - 8447D	Pre-Amplifier	Hewlett Packard	PRA01	98.5	99.5
☐ - 8447D	Pre-Amplifier	Hewlett Packard	PRA02	98.5	99.5
☐ - 8447D	Pre-Amplifier	Hewlett Packard	PRA03	98.5	99.5
☐ - SAU-3018M	Pre-Amplifier	Sogo-Denshi	PRA04	98.5	99.5

All used test-instruments are calibrated at least once a year.

The measurement of **the radiated emissions (electric field)** was performed in a horizontal and vertical polarization at a nonreflecting open site and test distance of:

☐ - Open site No. 1
■ - Open site No. 2
☐ - Open site No. 3

■ - 3 meters
☐ - 10 meters
☐ - 30 meters

Used test instruments :

Model	Name	Manufacturer	Code No.	Cal.date	Next cal.
☐ - ESV	Test Receiver	Rohde & Schwarz	RCV01	97.8	98.8
■ - ESVS10	Test Receiver	Rohde & Schwarz	RCV02	97.12	98.12
☐ - ESPC	Test Receiver	Rohde & Schwarz	RCV03	97.9	98.9
■ - BBA9106	Biconical	Schwarzbeck	BCA02	98.5	99.5
☐ - BBA9106	Biconical	Schwarzbeck	BCA03	98.5	99.5
☐ - BBA9106	Biconical	Schwarzbeck	BCA04	98.5	99.5
☐ - 3146	Logperiodic	EMCO	LGA01	98.5	99.5
■ - 3146	Logperiodic	EMCO	LGA02	98.5	99.5
■ - 3147	Logperiodic	EMCO	LGA03	98.5	99.5
☐ - 3146	Logperiodic	EMCO	LGA05	98.5	99.5
☐ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD01	98.6	99.6
☐ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR01	98.6	99.6
☐ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA01	97.12	98.12
■ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD02	98.3	99.3
■ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR02	98.3	99.3
■ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA02	98.1	99.1
☐ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD03	97.9	98.9
☐ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR03	97.9	98.9
☐ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA03	97.9	98.9
■ - R3361B	Spectrum Analyzer	ADVANTEST	SPTG03	98.5	99.5
☐ - 8447D	Pre-Amplifier	Hewlett Packard	PRA01	98.5	99.5
■ - 8447D	Pre-Amplifier	Hewlett Packard	PRA02	98.5	99.5
☐ - 8447D	Pre-Amplifier	Hewlett Packard	PRA03	98.5	99.5
■ - SAU-3018M	Pre-Amplifier	Sogo-Denshi	PRA04	98.5	99.5

All used test-instruments are calibrated at least once a year.

The measurement of **the interference power** was performed by using the absorbing clamp on the mains and interface cables at :

☐ - Open site No. 1
☐ - Open site No. 2
☐ - Shielded room No. 4

Used test instruments :

Model	Name	Manufacturer	Code No.	Cal.date	Next cal.
☐ - ESV	Test Receiver	Rohde & Schwarz	RCV01	97.8	98.8
☐ - ESVS10	Test Receiver	Rohde & Schwarz	RCV02	97.12	98.12
☐ - ESPC	Test Receiver	Rohde & Schwarz	RCV03	97.9	98.9
☐ - MDS21	Absorbing Clamp	Rohde & Schwarz	CLP01	97.8	98.8
☐ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD01	98.6	99.6
☐ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR01	98.6	99.6
☐ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA01	97.12	98.12
☐ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD02	98.3	99.3
☐ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR02	98.3	99.3
☐ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA02	98.1	99.1
☐ - 8567A(display)	Spectrum Analyzer	Hewlett Packard	SPD03	97.9	98.9
☐ - 8567A(RF unit)	Spectrum Analyzer	Hewlett Packard	SPR03	97.9	98.9
☐ - 85650A	Quasi Peak Adapter	Hewlett Packard	QPA03	97.9	98.9
☐ - R3361B	Spectrum Analyzer	ADVANTEST	SPTG03	98.5	99.5
☐ - 8447D	Pre-Amplifier	Hewlett Packard	PRA01	98.5	99.5
☐ - 8447D	Pre-Amplifier	Hewlett Packard	PRA02	98.5	99.5
☐ - 8447D	Pre-Amplifier	Hewlett Packard	PRA03	98.5	99.5
☐ - SAU-3018M	Pre-Amplifier	Sogo-Denshi	PRA04	98.5	99.5

All used test-instruments are calibrated at least once a year.

The measurements of **the harmonic currents** and **voltage fluctuations / flicker** was performed in No. 4 shielded room.

Used test instruments :

	Model	Name	Manufacturer	Code No.	Cal.date	Next cal.
☐ -	PM3000A	Power Analyzer	Voltech	UPA01	98.6	99.6
☐ -	SIB-30	Ref. Impedance	DENKENSEIKI	RIN01	97.11	98.11
☐ -	RTI-N3kVA	Supply Source	DENKENSEIKI	CVC03	97.11	98.11

All used test-instruments are calibrated at least once a year.

EQUIPMENT UNDER TEST

Description of the EUT :

The EUT is a DVD-ROM DRIVE which is used mainly for a desktop computer.

Operation - mode of the EUT :

The equipment under test was operated during the measurement under following conditions :

- ☐ - Standby
- ☐ - Test program (H - Pattern)
- ☐ - Test program (color bar)
- ☐ - Test program (customer specific)
- ■ - Continuous mode : (1) DVD-ROM Drive reads data at random.
  (2) Print data are transferred from Cpmputer to Printer.
  (3) CRT Display displays "H" characters.
  Repeats from (1) to (3)

TEST RESULT

Conducted emissions (AC line) 10/150/450 kHz - 30 MHz

The requirements are ■ - MET ☐ - NOT MET

Min. limit margin :

Quasi-peak 12.7 dB at 11.182 MHz

Average _____ dB at _____ MHz

Remark : _____

Radiated emissions (magnetic field) 10/150 kHz - 30 MHz

The requirements are ☐ - MET ☐ - NOT MET

Min. limit margin _____ dB at _____ MHz

Remark : _____

Radiated emissions (electric field) 30 MHz - 2000 MHz

The requirements are ■ - MET ☐ - NOT MET

Min. limit margin 5.5 dB at 132.62 MHz

Remark : _____

Interference power at the mains and interface cables 30 MHz - 300 MHz

The requirements are ☐ - **MET** ☐ - **NOT MET**

Min. limit margin :

Quasi-peak _____ dB at _____ MHz

Average _____ dB at _____ MHz

Remark : _____

Equivalent radiated emissions (electric field) 1 GHz - 18 GHz

The requirements are ☐ - **MET** ☐ - **NOT MET**

Min. limit margin _____ dB at _____ MHz

Remark : _____

Harmonic currents

The requirements are ☐ - **MET** ☐ - **NOT MET**

Remark : _____

Voltage fluctuations and flicker

The requirements are ☐ - **MET** ☐ - **NOT MET**

relative voltage change characteristic : d(t) = _____ ms
maximum relative voltage change : dmax = _____ %
relative steady-state voltage change : dc = _____ %
short-term flicker indicator : Pst = _____

Remark : _____

DATA OF CONDUCTION TEST

EMC Kashima Corporation
No.2 Test Site

COMPANY	: TOSHIBA CORPORATION	REPORT No.	: TR2-98243F
TRADE NAME	: TOSHIBA	REGULATION	: FCC Part 15 Subpart B
EQUIPMENT	: DVD-ROM DRIVE	CLASS	: Class B
MODEL	: SD-M1202	DATE	: 98/06/27
POWER	: DC +5V / DC +12V	FCC ID	: CJ6AT98-033
DESCRIPTION	:		
REMARKS	: AC120V/60Hz (AC:PC)	ENGINEER	: SHINICHI DEOKA

No	FREQ	N		L		LISN FACTOR	-13dB	RESULT	LIMITS	MARGIN
		QP	AV	QP	AV					
	[MHz]	[dBμV]		[dBμV]		[dB]	[dB]	[dBμV]	[dBμV]	[dB]
1	0.5611	32.5	-	32.5	-	0.3	0	32.8	48.0	15.2
2	0.6550	33.3	-	33.5	-	0.3	0	33.8	48.0	14.2
3	0.8125	34.0	-	34.0	-	0.3	0	34.3	48.0	13.7
4	1.0315	32.5	-	33.0	-	0.4	0	33.4	48.0	14.6
5	2.5688	29.0	-	29.5	-	0.5	0	30.0	48.0	18.0
6	3.1944	30.5	-	30.5	-	0.5	0	31.0	48.0	17.0
7	11.1820	34.0	-	34.3	-	1.0	0	35.3	48.0	12.7
8	15.9754	32.7	-	32.5	-	1.4	0	34.1	48.0	13.9
9	23.9630	26.0	-	26.0	-	1.7	0	27.7	48.0	20.3

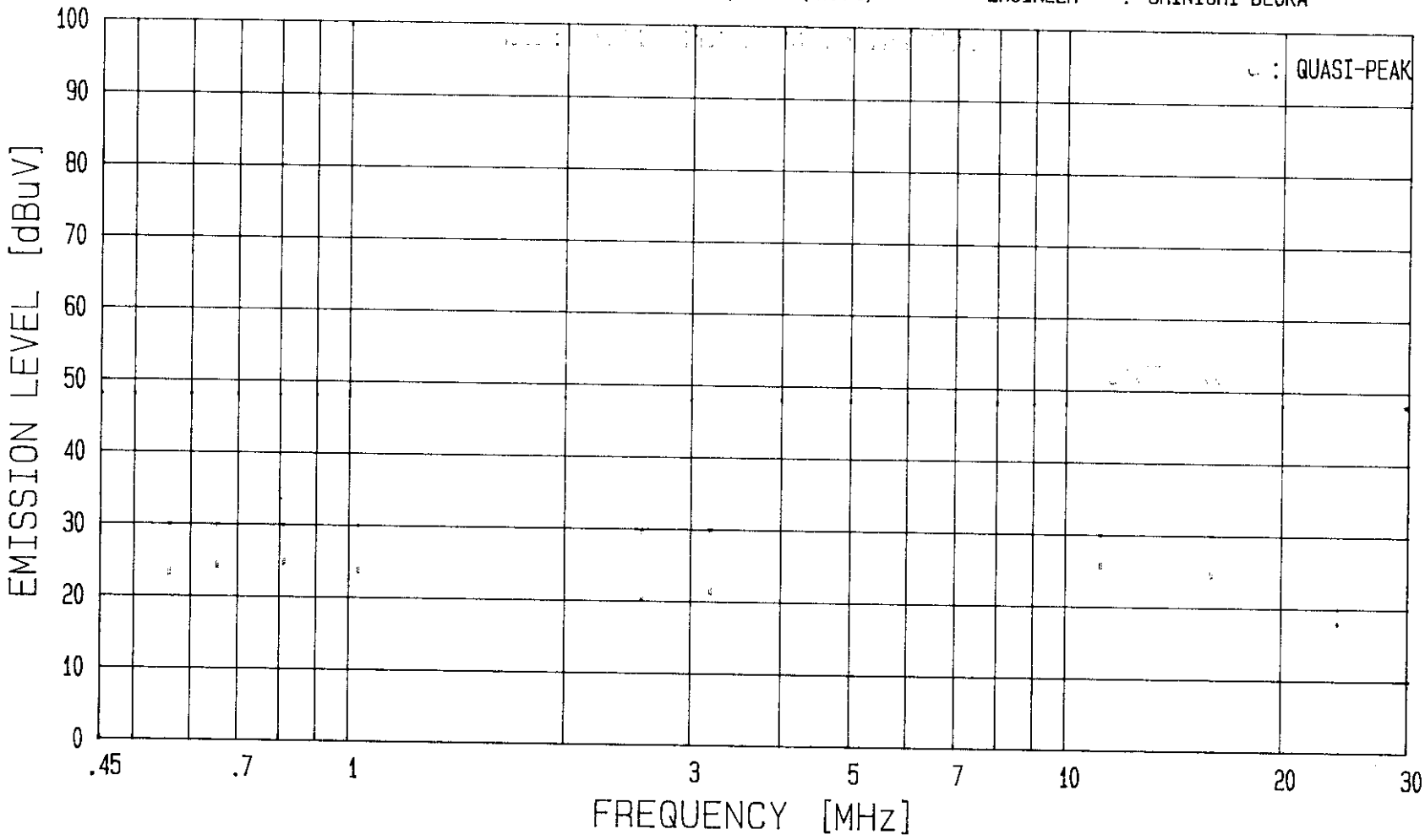
Sample Calculation : Result = Reading(Higher data of N/L) + LISN factor

CONDUCTION TEST

COMPANY : TOSHIBA CORPORATION
TRADE NAME : TOSHIBA
EQUIPMENT : DVD-ROM DRIVE
MODEL : SD-M1202
POWER : DC +5V / DC +12V
DESCRIPTION :
REMARKS : AC120V/60Hz (AC: PC)

REPORT No. : TR2-98243F
REGULATION : FCC Part 15 Subpart B
CLASS : Class B
DATE : 98/06/27
FCC ID : CJ6AT98-033

ENGINEER : SHINICHI DEOKA



DATA OF RADIATION TEST

EMC Kashima Corporation
No.2 Test Site

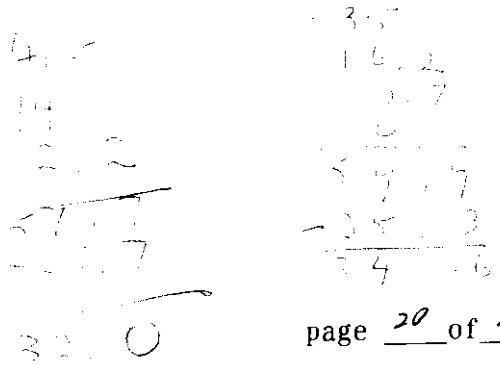
COMPANY : TOSHIBA CORPORATION
TRADE NAME : TOSHIBA
EQUIPMENT : DVD-ROM DRIVE
MODEL : SD-M1202
POWER : DC +5V / DC +12V
DESCRIPTION :
REMARKS : AC120V/60Hz (AC:PC)
TESTED DATE : 98/06/27
FCC ID : CJ6AT98-033

REPORT No. : TR2-98243F
REGULATION : FCC Part 15 Subpart B
CLASS : Class B
DISTANCE : 3 m
ATTENUATOR : 6 dB

ENGINEER : SHINICHI DEOKA

No	FREQ [MHz]	ANT TYPE	READING HOR [dBμ V] 3m	READING VER [dBμ V] 3m	ANT FACTOR [dB/m]	CABLE LOSS [dB]	AMP GAIN [dB]	RESULT HOR [dBμ V/m] 3m	RESULT VER [dBμ V/m] 3m	FCC LIMITS [dBμ V/m] 3m	MARGIN HOR [dB]	MARGIN VER [dB]
1	35.50	BC	-	36.5	16.2	1.1	26.0	-	33.8	40.0	-	6.2
2	40.50	BC	-	37.5	14.2	1.2	26.0	-	32.9	40.0	-	7.1
3	61.80	BC	42.0	44.5	6.9	1.5	26.0	30.4	32.9	40.0	9.6	7.1
4	76.10	BC	-	41.0	6.9	1.6	25.9	-	29.6	40.0	-	10.4
5	99.46	BC	39.7	38.5	10.9	1.8	25.8	32.7	31.5	43.5	10.8	12.0
6	132.62	BC	37.5	41.5	14.0	2.2	25.7	34.0	38.0	43.5	9.5	5.5
7	164.92	BC	32.0	-	15.0	2.5	25.6	29.9	-	43.5	13.6	-
8	198.93	BC	35.0	-	16.2	2.7	25.3	34.6	-	43.5	8.9	-
9	200.27	LP	32.5	-	11.5	2.8	25.3	27.4	-	43.5	16.1	-
10	202.93	LP	37.0	-	11.5	2.8	25.3	31.9	-	43.5	11.6	-
11	206.11	LP	35.0	-	11.4	2.8	25.3	29.9	-	43.5	13.6	-
12	209.56	LP	36.7	-	11.4	2.8	25.3	31.6	-	43.5	11.9	-
13	212.22	LP	34.0	-	11.3	2.9	25.3	28.9	-	43.5	14.6	-
14	298.40	LP	36.5	-	14.7	3.3	25.1	35.4	-	46.0	10.6	-
15	400.00	LP	-	32.5	15.6	4.0	25.9	-	32.2	46.0	-	13.8
16	596.81	LP	34.0	-	18.9	5.0	26.8	37.1	-	46.0	8.9	-

Sample Calculation :
Result = Reading + Ant.Factor + Cable Loss - Amp.Gain + Atten.

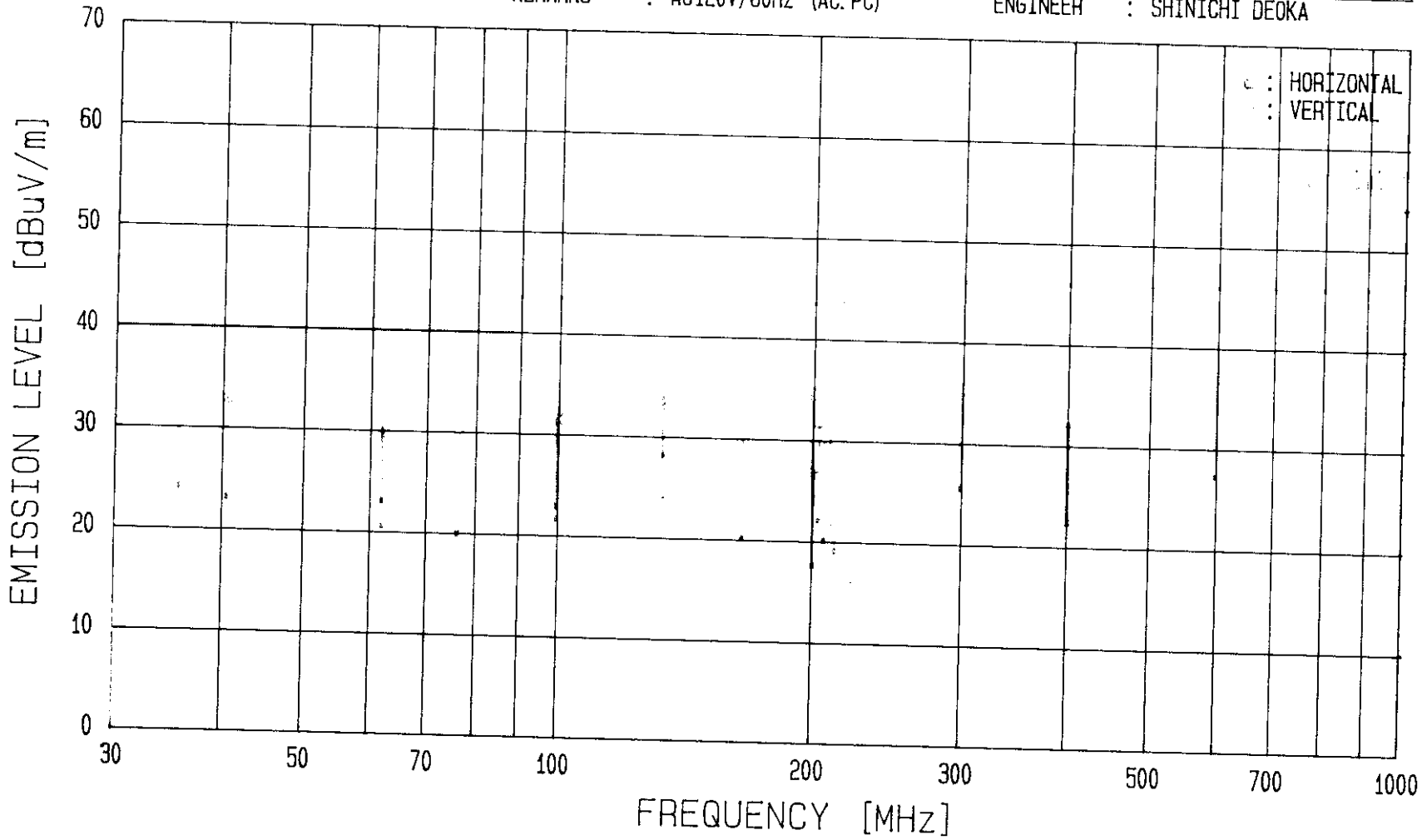


RADIATION TEST

COMPANY : TOSHIBA CORPORATION
TRADE NAME : TOSHIBA
EQUIPMENT : DVD-ROM DRIVE
MODEL : SD-M1202
POWER : DC +5V / DC +12V
DESCRIPTION :
REMARKS : AC120V/60Hz (AC: PC)

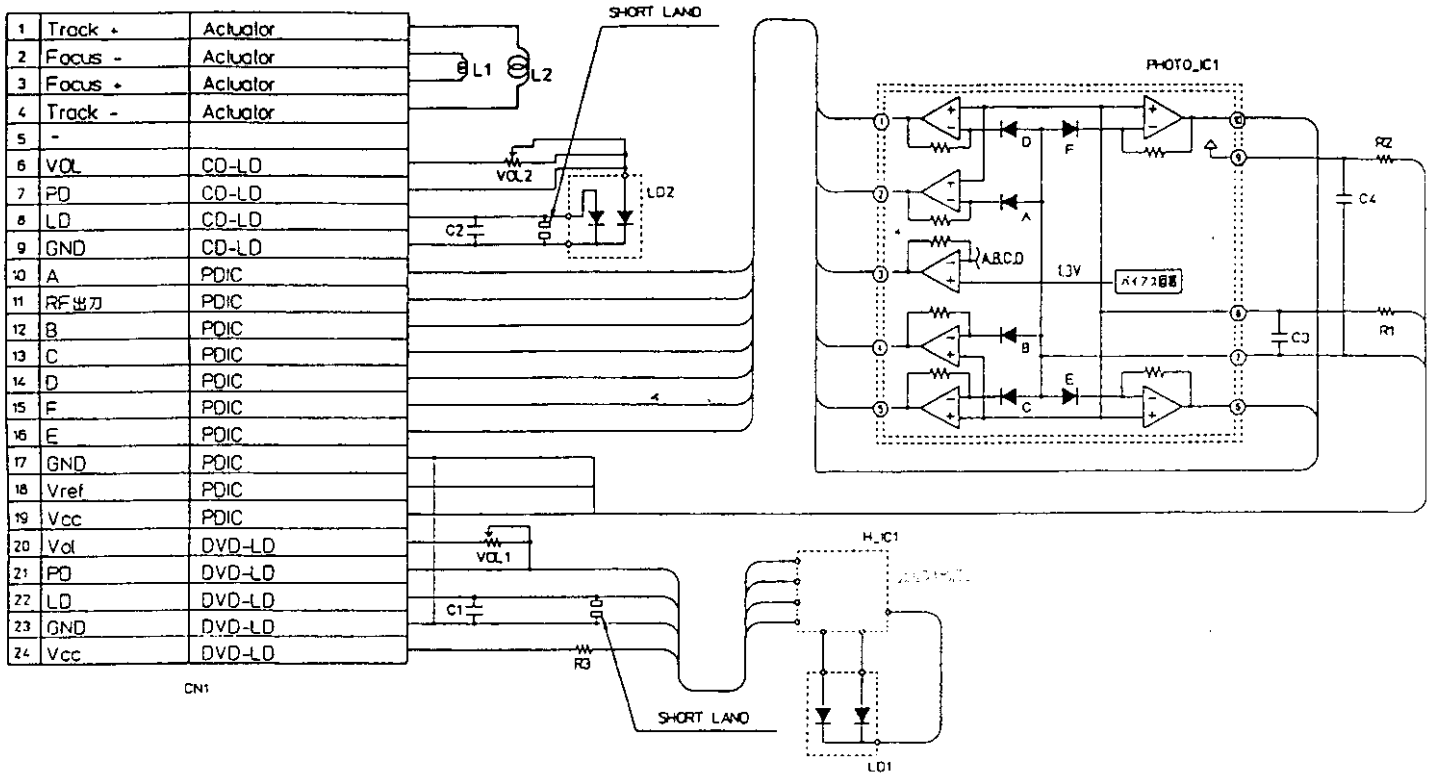
REPORT No. : TR2-98243F
REGULATION : FCC Part 15 Subpart B
CLASS : Class B
DATE : 98/06/27
FCC ID : CJ6AT98-033

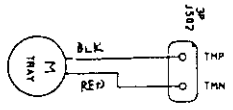
ENGINEER : SHINICHI DEOKA

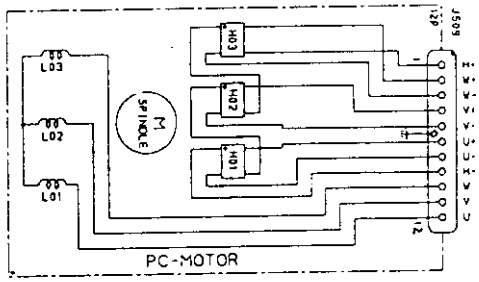


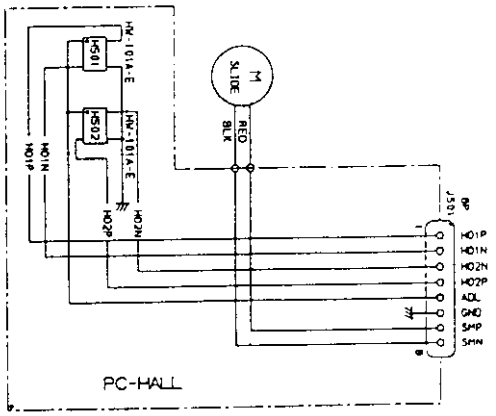
1	Track +	Actuator
2	Focus -	Actuator
3	Focus +	Actuator
4	Track -	Actuator
5	-	
6	VOL	CD-LD
7	PD	CD-LD
8	LD	CD-LD
9	GND	CD-LD
10	A	PDIC
11	RF出力	PDIC
12	B	PDIC
13	C	PDIC
14	D	PDIC
15	F	PDIC
16	E	PDIC
17	GND	PDIC
18	Vref	PDIC
19	Vcc	PDIC
20	Vol	DVD-LD
21	PD	DVD-LD
22	LD	DVD-LD
23	GND	DVD-LD
24	Vcc	DVD-LD

CN1

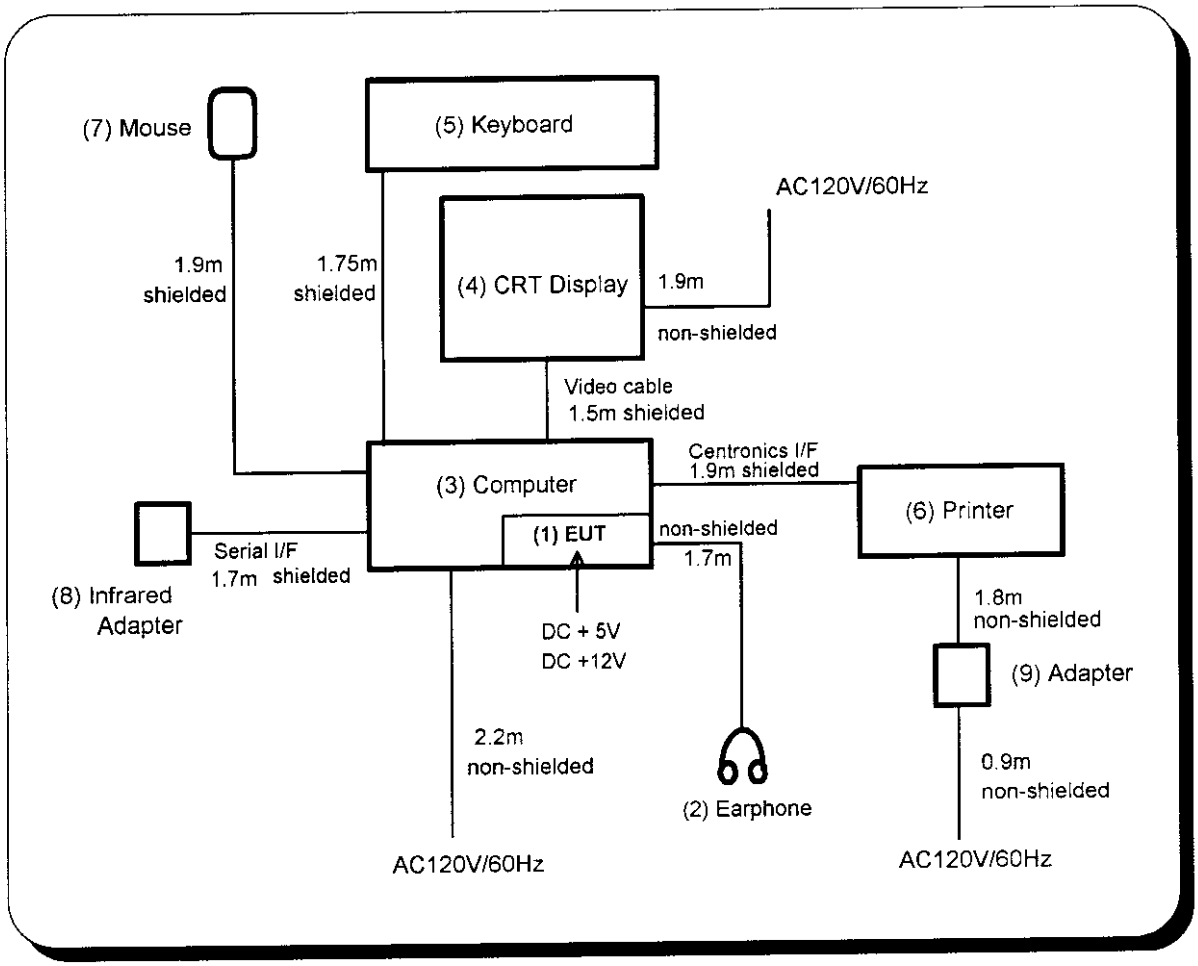








Drawn Tested System



Model	Serial	Description	Company	FCC ID
(1) SD-M1202 (EUT)	**86FXC70710**	**DVD-ROM DRIVE**	**TOSHIBA**	**CJ6AT98-033**
(2) MDR-E838	none	Earphone	SONY	N/A
(3) D3692A	SG50400169	PC	Hewlett Packard	HCJVECTRAVL5
(4) 444	540BA11AF392	CRT Display	COMPAQ	BR8SM-1557
(5) KFB1424-501	L6001563	Keyboard	Audio Technica	C9SKB1420
(6) C4608A	SG7661D0C5	Printer	Hewlett Packard	B94C2164X
(7) 90741	00313710	Mouse	Microsoft	C3KKMP3
(8) ESI-9680	9096	Infrared Adapter	Extended Systems	IBU9680
(9) C2178A	9100-5130	AC Adapter	Hewlett Packard	N/A

TEST FACILITIES

The open area site and conducted measurement facility used to collect the radiated data are located in 1614, Mushihata, Omigawa-machi, Katori-gun, Chiba-ken, 289-0341 Japan.

Accredited by the National Voluntary Laboratory Accreditation Program for FCC Part 15 and CISPR Publication 22 under Lab. Code 200070-0.

Reapproved by the Ministry of Commerce in New Zealand on August 26, 1997 by ENG 3/9 AJD in accordance with ISO/IEC Guide 25.

Renewedly recognized by TUV Product Service on August 16, 1995 by ID-No. J-001E to meet the requirements of EN45001.

No. 1 site was reregistered by FCC on September 30, 1996, No. 2 site on October 27, 1995. No. 3 open site and No. 4 shielded room were registered on October 16, 1997. The registered number is 31040/SIT 1300F2.

No. 1 and No. 2 site were reregistered by VCCI on October 1, 1997. The registered numbers are R-188 for No. 1 open site, C-187 for No. 1 shielded room, R-189 for No. 2 open site and C-188 for No. 2 shielded room. No. 3 open site was registered by VCCI on November 8, 1997 as registered number R-656, and No. 4 shielded room August 10, 1997 as C-613.

MEASUREMENT UNCERTAINTY

The treatment of the measurement uncertainty shall be based on "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results" by NIST Technical Note 1297 and "Treatment of Uncertainty in EMC Measurement" by NAMAS NIS81.

The measurement result is : y dBμV $\pm$ U dB
for a level of confidence of approximately 95%, (k=2)

ENVIRONMENTAL CONDITIONS

Temperature	26	℃
Humidity	59	%
Atmospheric pressure	1010	hPa