Matsushita-Kotobuki
Electronics Industries Ltd.
Matsuyama Division
Address: 2131-1 Minamikata, Kawauchi-cho, Onsen, Ehime 791 – 0395 Japan
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TEST REPORT

REPORT NUMBER : MKM99F-003

APPLICANT : Matsushita-Kotobuki
Electronics Industries, Ltd.

MODEL NUMBER : CR-593-B

FCC ID : IUO9TB079CRB

Regulation : FCC Part15B Class B

Conducted Emission Test
Radiated Emission Test

Matsushita-Kotobuki Electronics Ind., Ltd.
Matsuyama Division

2131-1 Minamikata, Kawauchi-cho, Onsen-gun,
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SECTION 1. TEST CERTIFICATION

APPLICANT INFORMATION

Company	:	Matsushita-Kotobuki Electronics Industries, Ltd.
Address	:	8-1, Furujin-machi, Takamatsu-city, Kagawa-ken, 760-0025 Japan

GRANTEE INFORMATION

Company	:	Matsushita-Kotobuki Electronics Industries, Ltd.
Division / Section	:	Matsuyama Division Legal Affairs Sec.
Address	:	2131-1 Minamikata, Kawauchi-cho, Onsen-gun, Ehime-ken, 791-0395 Japan
Telephone number	:	+81 89 966 2111
Fax number	:	+81 89 966 5733
Contact person	:	Kenji Matsugi

DESCRIPTION OF TEST ITEM

Kind of equipment	:	CD-ROM Drive
Trademark	:	Matsushita-Kotobuki
FCC ID	:	IUO9TB079CRB
Model number	:	CR-593-B
Serial number	:	9528XXX00012

TEST PERFORMED

FCC Registration No.	:	90793
Test started	:	June 22, 1999
Test completed	:	June 22, 1999
Purpose of test	:	FCC Docket 87-389
Regulation	:	FCC Part 15B Class B Unintentional Radiators
Test setup	:	ANSI C63.4 -1992

Report file number : MKM99F-003

Report issue date : June 22, 1999

Test engineer : Shinji Yamauchi

Report approved by : Shigeru Suzuki
[Manager]

This equipment complies with above standard or regulation under the test condition or test configuration shown on this test report.

SECTION 2. EQUIPMENT UNDER TEST

The equipment under test (EUT) consists of the following equipment.
Indication in the following left side column corresponds to section 5.

Symbol	Item	Model No.	Serial No.	FCC ID	Manufacturer
A)	CD-ROM Drive	CR-593-B	9528XXX00012	IUO9TB079CRB	Matsushita-Kotobuki Electronics Ind., Ltd.

Power ratings of EUT : +5V DC, 1.2A / +12V DC, 1.4A

2.1 Port(s) / Connector(s) :

IDE Bus Connector(40pin), Head Phone Jack(Stereo Mini Plug),
Audio Out Connector(4pin), Digital Audio Out Connector(2pin), DC IN Connector(4pin)

2.2 Oscillator(s) / Crystal(s) :

Oscillator	Operating Frequency	Board name	Remarks
33.86 MHz	33.86 MHz	Main PCB	ECC & ATAPI I/F IC, LC895299
33.86 MHz	16.93 MHz	Main PCB	CPU, MN101CF29D

SECTION 3. SUPPORT EQUIPMENT USED

The EUT has been supported by the following equipment during these tests. Indication in the following left side column corresponds to section 5.

Symbol	Item	Model No.	Serial No.	FCC ID	Manufacturer
B)	Interface Card	LMEP0345A	None	IUO9TB035CRI	Matsushita-Kotobuki
C)	Host Computer	4865	4115HAM60075	CNT75M8403F1	COMPAQ
D)	Head Phone	RP-HT28	None	N.A.	Panasonic
E)	Stereo Radio Cassette Recorder	RX-F5	None	ACJ9TBRX-F5	Panasonic
F)	Keyboard	Enhanced II Keyboard	9101421CB515	CNT47K109232	COMPAQ
G)	Color Display	XC-1429C	009133290	BGB9J5XC-1429C	MITSUBISHI
H)	Printer	3630A	3219A17397	BSD8533630A	HEWLETT PACKARD
I)	Modem	C202A	010489	BKM552C202A	EPSON

SECTION 4. CABLE(S) USED

The following cable(s) was used for testing. Indication number in the following left side column corresponds to section 5.

Number	Name	Length	Shield	From	To
1)	40Pin Flat cable	0.4 m	None	CD-ROM Drive Plastic connector	Host Computer
2)	Audio cable	0.4 m	None	CD-ROM Drive Plastic connector	Interface Card
3)	Digital Audio cable	0.4 m	None	CD-ROM Drive Plastic connector	Interface Card
4)	DC Power cable	0.4 m	None	CD-ROM Drive	Host Computer
5)	Head Phone cable	1.5 m	None	CD-ROM Drive Plastic connector	Head Phone
6)	Audio cable	1.0 m	None	Interface Card	Stereo Radio Cassette Recorder
7)	Audio cable	1.0 m	None	Interface Card	Stereo Radio Cassette Recorder
8)	Keyboard I/F cable	1.4 m	Yes	Host Computer Metal connector	Keyboard
9)	Video Signal cable	1.5 m	Yes	Host Computer Metal connector	Color Display

None :

All cables are not attached ferrite core.

The following cable(s) was used for testing. Indication number in the following left side column corresponds to section 5.

Number	Name	Length	Shield	From	To
10)	Parallel I/F cable	1.5 m	Yes	Host Computer Metal connector	Printer
11)	RS-232C I/F cable	1.2 m	Yes	Host Computer Metal connector	Modem
12)	Power cord for Host Computer	2.0 m	Yes	Host Computer	Power Source
13)	Power cord for Stereo Radio Cassette Recorder	1.9 m	None	Stereo Radio Cassette Recorder	Power Source
14)	Power cord for Color Display	1.6 m	None	Color Display	Power Source
15)	Power cord for Printer	2.0 m	None	Printer	AC Adapter
16)	Power cord for Printer	2.0 m	None	AC Adapter	Power Source
17)	Power cord for Modem	1.9 m	None	Modem	Power Source

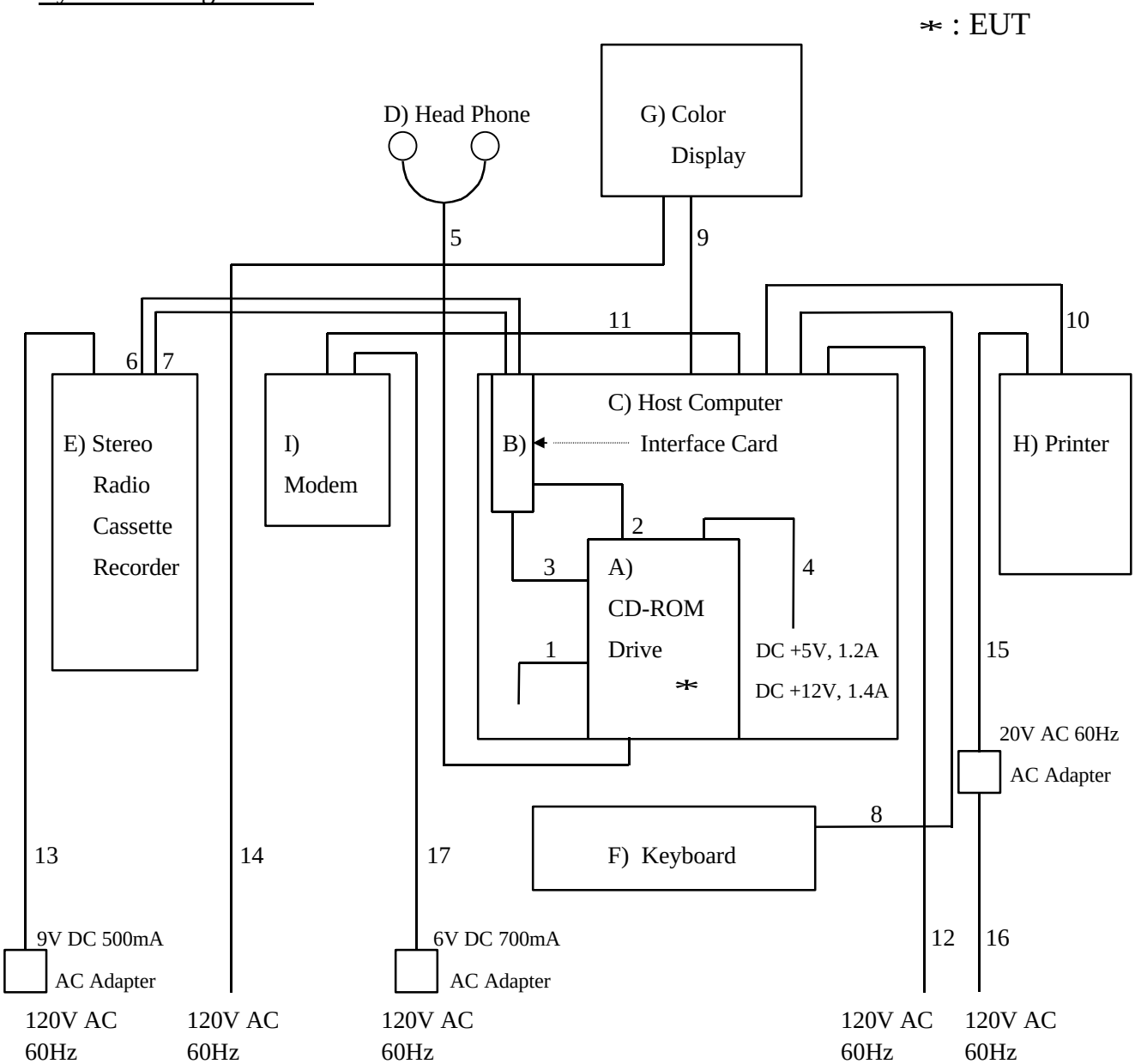
None :

All cables are not attached ferrite core.

SECTION 5. CONSTRUCTION OF EQUIPMENT

The construction of EUT during testing is as follows.

System configuration



Symbol or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 2 to 4.

SECTION 6. OPERATING CONDITIONS

The EUT has been operated under the following conditions during the tests.

6.1 Operating condition

The tests have been carried out under Read mode.

6.2 Operation flow

Performed following operations continuously.

1. The EUT operates the normal speed.
2. The EUT play-backs the audio data.
3. The EUT reads 'H' characters' data.
4. The Color Display displays 'H' characters.
5. The Printer prints 'H' characters' data.
6. The Modem sends 'H' characters' data.
7. The EUT changes the disc rotating speed to the 40 times.
8. The EUT play-backs the audio data.
9. The EUT reads 'H' characters' data.
10. The Color Display displays 'H' characters.
11. The Printer prints 'H' characters.
12. The Modem sends 'H' characters' data.

SECTION 7. TEST PROCEDURE(S)

Tests have been carried out with the test procedure(s) drawn up by our laboratory which is in accordance with the following test procedure(s).

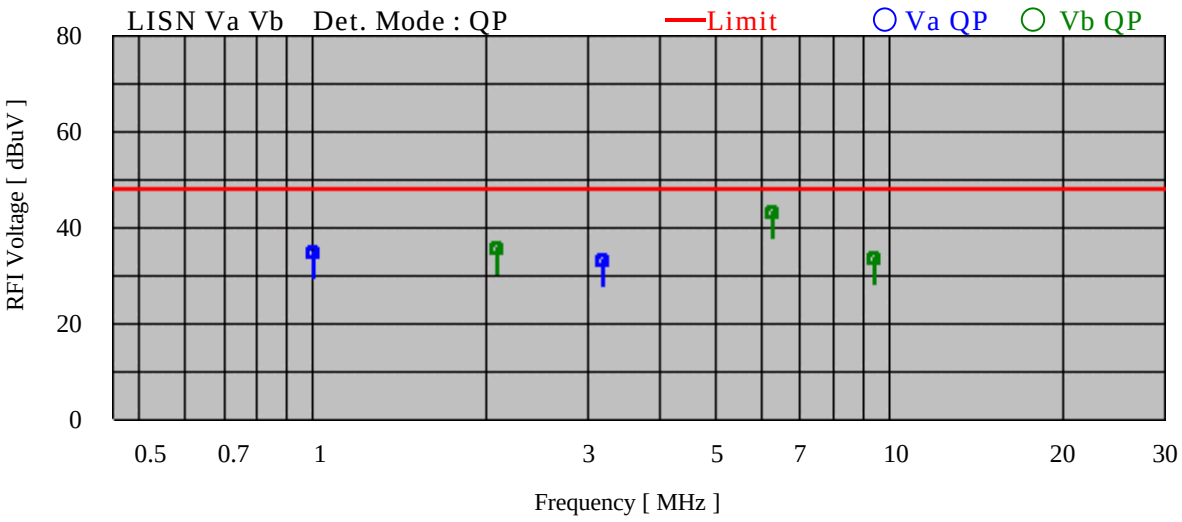
Test item	Test procedure used	Scanned Frequency Range
Conducted Emission	ANSI C63.4-1992	0.45 - 30 MHz
Radiated Emission	ANSI C63.4-1992	30 - 1000 MHz

SECTION 8. EVALUATION OF TEST RESULTS

8.1 Conducted Emission Test

Product Name	:	CD-ROM Drive
Model No.	:	CR-593-B
Serial No.	:	9528XXX00012
Power Supply	:	120V / 60Hz
Test Mode	:	Read mode
Temp / Humi / Pres	:	23℃ / 61% / 995hPa
Operator	:	S. Yamauchi

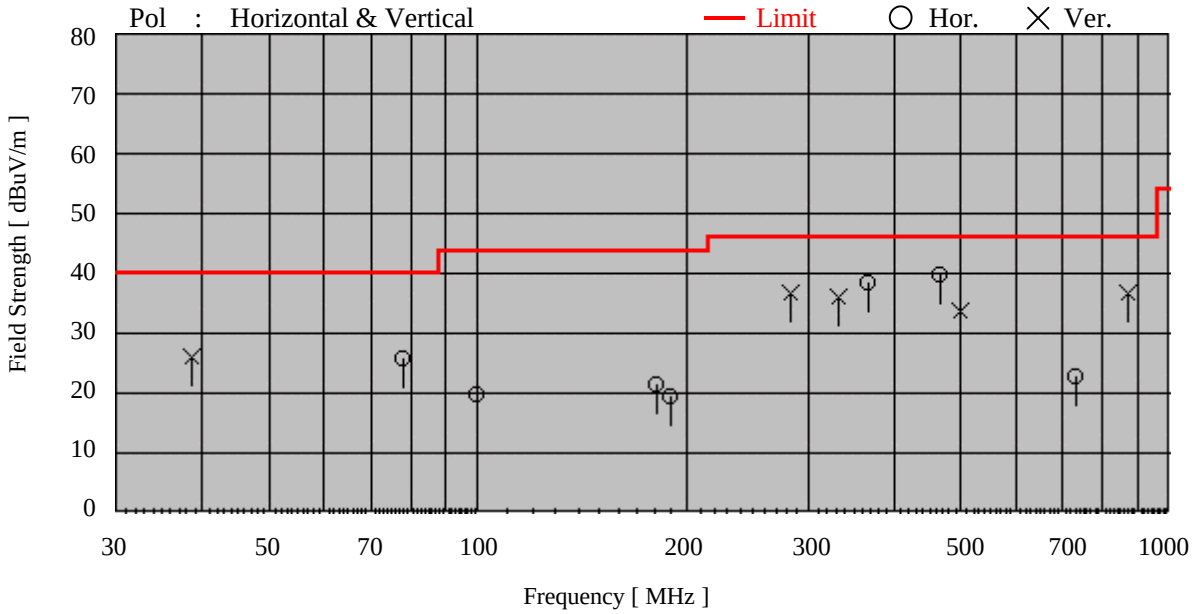
No	Freq.	Reading Level		Factor	Emission Level		Limit	Margin
		Va	Vb		Va	Vb		
	[MHz]	[dBuV]		[dB]	[dBuV]		[dBuV]	[dB]
1	1.007	34.6	----	0.1	34.7	----	48.0	13.3
2	2.101	----	35.3	0.2	----	35.5	48.0	12.5
3	3.193	32.7	----	0.2	32.9	----	48.0	15.1
4	6.293	----	42.5	0.3	----	42.8	48.0	5.2
5	6.294	42.8	----	0.3	43.1	----	48.0	4.9
6	9.440	----	32.9	0.4	----	33.3	48.0	14.7



8.2 Radiated Emission Test

Product Name	:	CD-ROM Drive
Model No.	:	CR-593-B
Serial No.	:	9528XXX00012
Power Supply	:	120V / 60Hz
Test Mode	:	Read mode
Temp / Humi / Pres	:	23℃ / 61% / 995hPa
Operator	:	S. Yamauchi

No	Freq.	Reading Level Hor.	Reading Level Ver.	Factor	Emission Level Hor.	Emission Level Ver.	Limit	Margin
	[MHz]	[dBuV]		[dB]	[dBuV/m]		[dBuV/m]	[dB]
1	38.726	----	8.7	17.3	----	26.0	40.0	14.0
2	78.012	17.3	----	8.4	25.7	----	40.0	14.3
3	99.990	7.5	----	12.3	19.8	----	43.5	23.7
4	182.204	2.9	----	18.4	21.3	----	43.5	22.2
5	189.797	0.7	----	18.5	19.2	----	43.5	24.3
6	283.209	----	15.1	21.5	----	36.6	46.0	9.4
7	333.338	----	16.4	19.5	----	35.9	46.0	10.1
8	366.675	18.8	----	19.5	38.3	----	46.0	7.7
9	466.664	18.6	----	21.2	39.8	----	46.0	6.2
10	499.980	----	12.5	21.3	----	33.8	46.0	12.2
11	732.217	-3.8	----	26.5	22.7	----	46.0	23.3
12	868.938	----	9.1	27.4	----	36.5	46.0	9.5



8.3 Conclusion

This test report clearly shows that the EUT is in compliance with the FCC Part 15B, Class B specification.

The minimum margins to the limits are as follows:

Conduction measurement	4.9 dB	at	6.294 MHz
Radiation measurement	6.2 dB	at	466.664 MHz

8.4 Sample Calculations

8.4.1 Conducted Emission

			Example @ 6.294 MHz
Emission Level	=	Meter Reading	42.8 dBuV
	+	A.M.N. Factor	+ 0.3 dB
			= 43.1 dBuV
Margin	=	Limit	48.0 dBuV
	-	Emission Level	- 43.1 dBuV
			= 4.9 dB

A.M.N. : Artificial Mains Network = Line Impedance Stabilization Network (LISN)

8.4.2 Radiated Emission

			Example @ 466.664 MHz
Emission Level	=	Meter Reading	18.6 dBuV
	+	Factor	+ 21.2 dB
(Factor	=	Antenna Factor + Cable Loss)	
			= 39.8 dBuV/m
Margin	=	Limit	46.0 dBuV/m
	-	Emission Level	- 39.8 dBuV/m
			= 6.2 dB

SECTION 9. PHOTOGRAPHS OF TEST SET-UP

Test setup in accordance with ANSI C63.4-1992

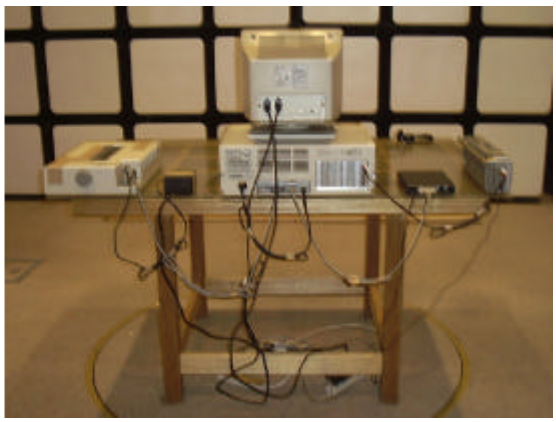
9.1 Conducted Emission Test

Front View

Rear view

9.2 Radiated Emission Test

Front View



Rear view

Note : Maintaining 10cm spacing between all the equipment cabinets.

SECTION 10. INSTRUMENTS USED FOR TEST

Instrument	Model No.	Serial No.	Manufacturer	Last cal.	Period
EMI Test Receiver	85462A	3520A00241	Hewlett Packard	11/98	1 Year
RF Filter Section	85460A	3448A00210	Hewlett Packard	11/98	1 Year
Biconical Antenna	BBA9106	None	Schwarzbeck	11/98	1 Year
Logperiodic Antenna	UHALP9107	1622	Schwarzbeck	11/98	1 Year
Double Ridged Antenna	3115	9702-5139	EMCO	7/98	1 Year
Artificial Mains Network(AMN) = Line Impedance Stabilization Network(LISN)	ESH3-Z5	840062/024	Schwarzbeck	6/98	1 Year
Artificial Mains Network(AMN) = Line Impedance Stabilization Network(LISN)	ESH3-Z5	840062/028	Schwarzbeck	7/98	1 Year

SECTION 11. PRECISION

Tolerances of the measuring instruments are shown on below.

1. Antenna factor ± 2.0 dB
2. Cable loss ± 1.0 dB
3. EMI test receiver ± 2.0 dB
4. Artificial Mains Network(AMN) impedance ± 20%
   = Line Impedance Stabilization Network(LISN)
5. Site Attenuation ± 4.0 dB

Repeatability and reproducibility about maximum emission setup are not specified herein.

SECTION 12. VALIDITY TEST REPORT

12.1 The test result of this report is effective for equipment under test itself and under the test configuration described on the report.

12.2 This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.

12.3 Copying of this report without permission is prohibited.