

**MATSUSHITA-KOTOBUKI  
ELECTRONICS INDUSTRIES LTD.**

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Date: July 22, 1998

Report of Measurements (Part I)

REQUIRED IN ( ) SUBPART B (TV INTERFACE DEVICE)  
( X ) SUBPART B (DIGITAL DEVICE)

EXHIBIT # : 3-1  
FCC ID : GSS99003  
OUR REF. : MKS98-F009  
MODEL NO. : VPRJ21452  
Sheet 1 of 9 Sheets

Name of Manufacturer: Matsushita-Kotobuki Electronics Industries Ltd.

Address of Manufacturer: 247 Fukutake, Saijo, Ehime, Japan.

Device Under Measurement

FCC ID : GSS99003  
Model No. : VPRJ21452  
Trade Name : ViewSonic  
Applicant : ViewSonic Corporation

This device is a representative model of SP-25S chassis group.

Certification

On the basis of the measurement data contained in Part II, all devices bearing the aforementioned FCC ID (model No., chassis No., and trade names) are stated by the undersigned to be capable of complying with the applicable sections of Part 15 of the FCC rules governing restricted radiation devices at the time of manufacture and may be expected to continue to comply under normal conditions and with usual maintenance. The undersigned also states that the device measured was an engineering prototype, pre-production, or production unit. If changes are applied to future units and such changes adversely alter spurious radiation, an amended report of measurements will be supplied to the FCC.



K. Ishikawa  
Sr. Engineer

**MATSUSHITA – KOTOBUKI  
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Part 15 Subpart B. (Digital Device) – Part II

Sheet 2 of 9 Sheets

1) 15.107 Power Line Conducted Voltage

Freq. (MHz)	Limits (dBuV)	Interference (dBuV)	
		1-end & Grounded	The other- End & Gro.
0.58	48.0	27.7	27.3
0.82	48.0	26.6	26.3
0.91	48.0	28.3	27.9
1.13	48.0	35.6	35.4
7.01	48.0	33.1	32.7
29.90	48.0	23.4	23.1

(Refer to Sheet 3, 5, 7 of 9 Sheets)

2) 15.109 Radiated Emission

Freq. (MHz)	Limits (dBuV/m)	Emission (dBuV/m)	
		Horiz.	Vert.
40.00	40.0	21.4	26.1
46.20	40.0	24.1	34.2
80.00	40.0	27.6	33.4
119.96	43.5	27.4	36.9
160.01	43.5	31.5	32.1
216.00	43.5	33.4	33.6

(Refer to Sheet 4, 6, 8, 9 of 9 Sheets)

MEASUREMENT SITE : MKS SITE


MEASUREMENT PROCEDURE : ANSI C63.4-1992

Note:

(1) Detailed report: Refer to attached sheets.

I HEREBY STATE THAT: The measurements shown in Part II of this form were made in accordance with The procedures indicated and the energy emitted by this equipment was found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements and vouch for the Qualifications of all persons taking them.

I FURTHER STATE THAT: On the basis of the measurements made, the device tested is capable of operation in compliance with the requirements of Part 15 of the FCC Rules under normal use and maintenance.

  
T. Watanabe  
Engineer

## 1) 15.107 Power Line Conducted Voltage

Freq. (MHz)	Meter Reading (dBuV)		LISN Factor (dB)	Matching Pad Loss (dB)	Interference (dBuV)	
	1-end & Grounded	The other- End & Gro.			1-end & Grounded	The other- End & Gro
0.58	21.4	21.0	0.1	6.2	27.7	27.3
0.82	20.3	20.0	0.1	6.2	26.6	26.3
0.91	22.0	21.6	0.1	6.2	28.3	27.9
1.13	29.3	29.1	0.1	6.2	35.6	35.4
7.01	26.5	26.1	0.4	6.2	33.1	32.7
29.90	16.2	15.9	1.0	6.2	23.4	23.1

Note:

## 1. Sample calculation at

$$\text{1-end \& Gro., 0.58 MHz ; } \underline{21.4 + 0.1 + 6.2 = 27.7 \text{ (dBuV)}}$$

## 2. Measuring Instruments:

- a) Field strength meter – Kyoritsu Electric Work Co., Ltd.  
 Model : KNM-402C  
 (1) Detector function : CISPR Q-PEAK  
 (2) IF band width : 9 kHz  
 (3) Input impedance : 75 ohms
- b) Line impedance stabilized network (LISN)  
 – Kyoritsu Electric Work Co., Ltd.  
 Model : KNW-406, KNW-407  
 50 ohms / 50 uh network
- c) Matching pad – Kyoritsu Electric Work Co., Ltd.  
 Model : KPD-401

## 3. The spectrum was checked from 0.45 MHz to 30 MHz and the six highest emissions relative to the appropriate limit were measured and reported.

## 2) 15.109 Radiated Emission

Freq. (MHz)	Meter Reading Open Volt. (dBuV)		Correction Factor (dB) Open Vol.	Emission at 3 meters (dBuV)	
	Horiz.	Vert.		Horiz.	Vert.
40.00	5.4	10.1	16.0	21.4	26.1
46.20	9.6	19.7	14.5	24.1	34.2
80.00	18.9	24.7	8.7	27.6	33.4
119.96	12.4	21.9	15.0	27.4	36.9
160.01	13.4	14.0	18.1	31.5	32.1
216.00	13.4	13.6	20.0	33.4	33.6

Note:

## 1. Sample calculation at

$$\text{Horiz., 40.00 MHz ; } 5.4 + 16.0 = 21.4 \text{ (dBuV/m)}$$

## 2. Measuring Instruments:

- a) Field strength meter – Rohde & Schwarz  
(for 30 MHz to 1 GHz) Model : ESVP
- (1) Frequency range : 20 MHz to 1300 MHz
  - (2) RF Input : 50 ohms
  - (3) IF band width : 7.5 kHz / 12 kHz/  
120 kHz / 1 MHz
  - (4) Detector function: Average/  
CISPR Q-PERK/PERK
- c) Receiving antenna – Schwarzbeck
- Model : VHA9103 30 – 300 MHz
  - Model : UHALP9107 300 – 1000 MHz
- The Electro-Mechanics Company
- Model : 3115 1 – 18 GHz

## 3. The Spectrum was checked from 30 MHz to 1000 MHz and the six highest emissions relative to the appropriate limit were measured and reported.

KNW-406 LISN

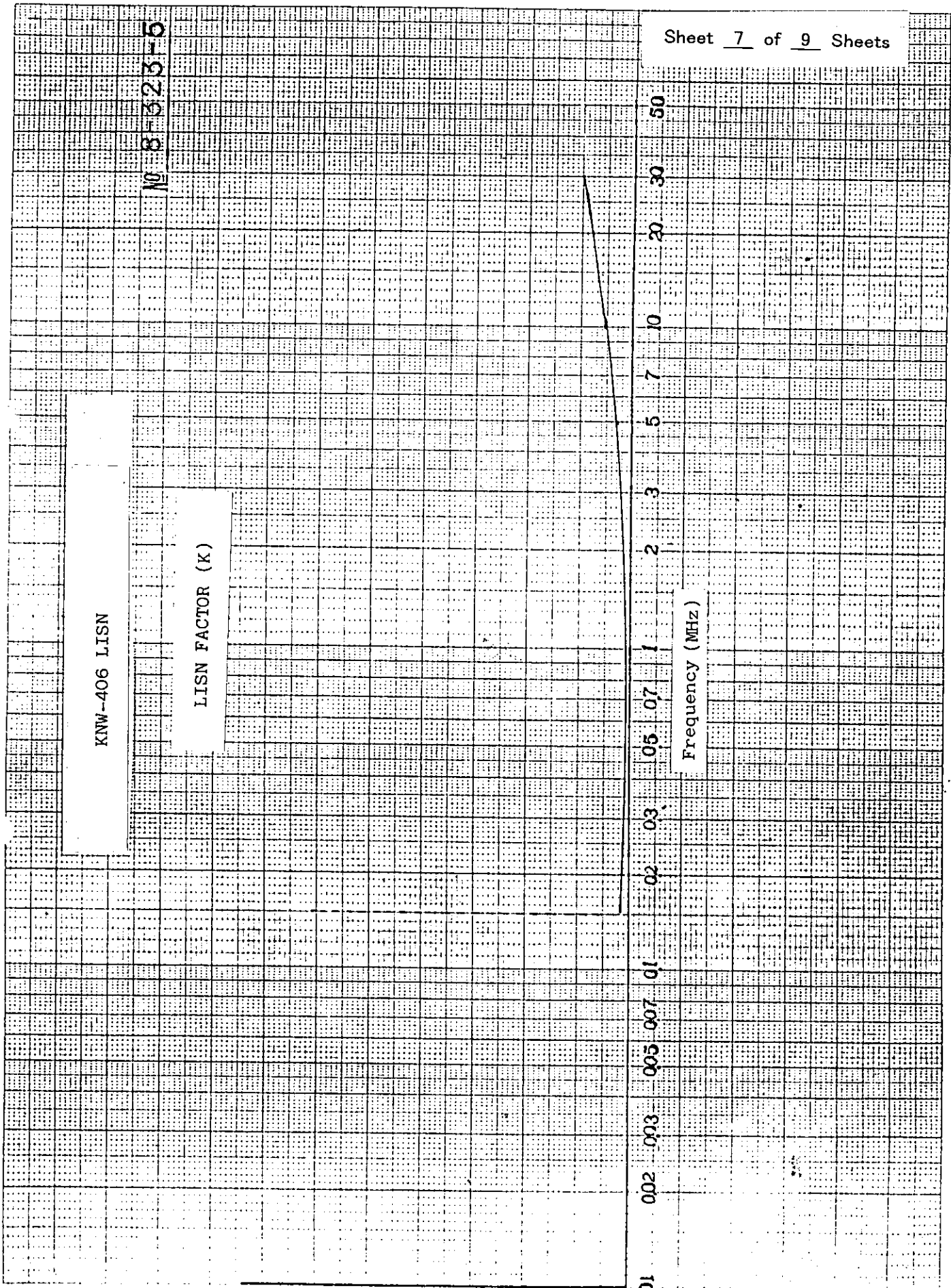
LISN FACTOR (K)

10 8 323-5

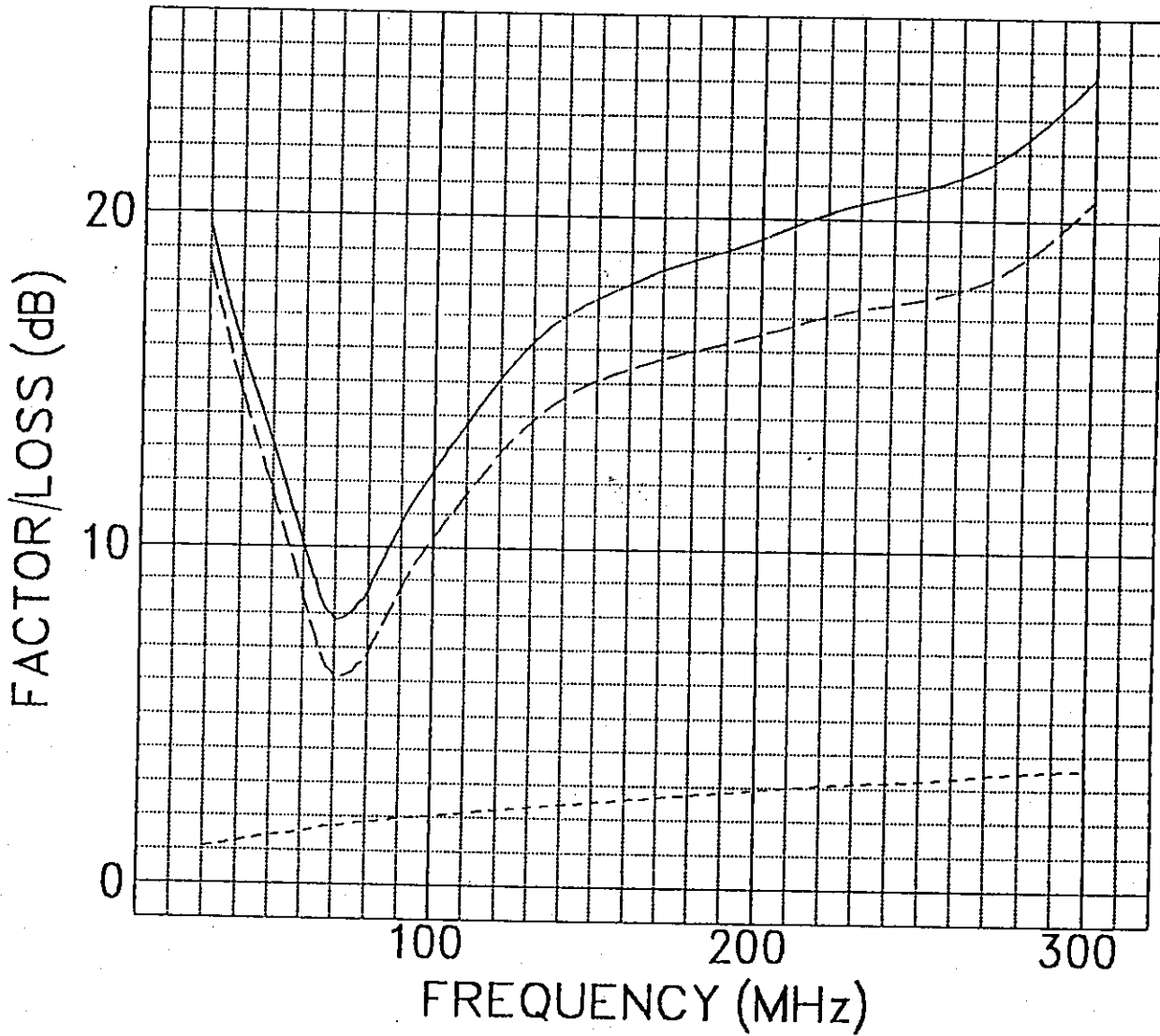
Frequency (MHz)

0.01 0.02 0.03 0.05 0.07 0.1 0.2 0.3 0.5 0.7 1 2 3 5 7 10 20 30 50

0 1 2 3 4 5 6



# CORRECTION FACTOR OF BBA9106



$E = V + K$

E : Field Strength

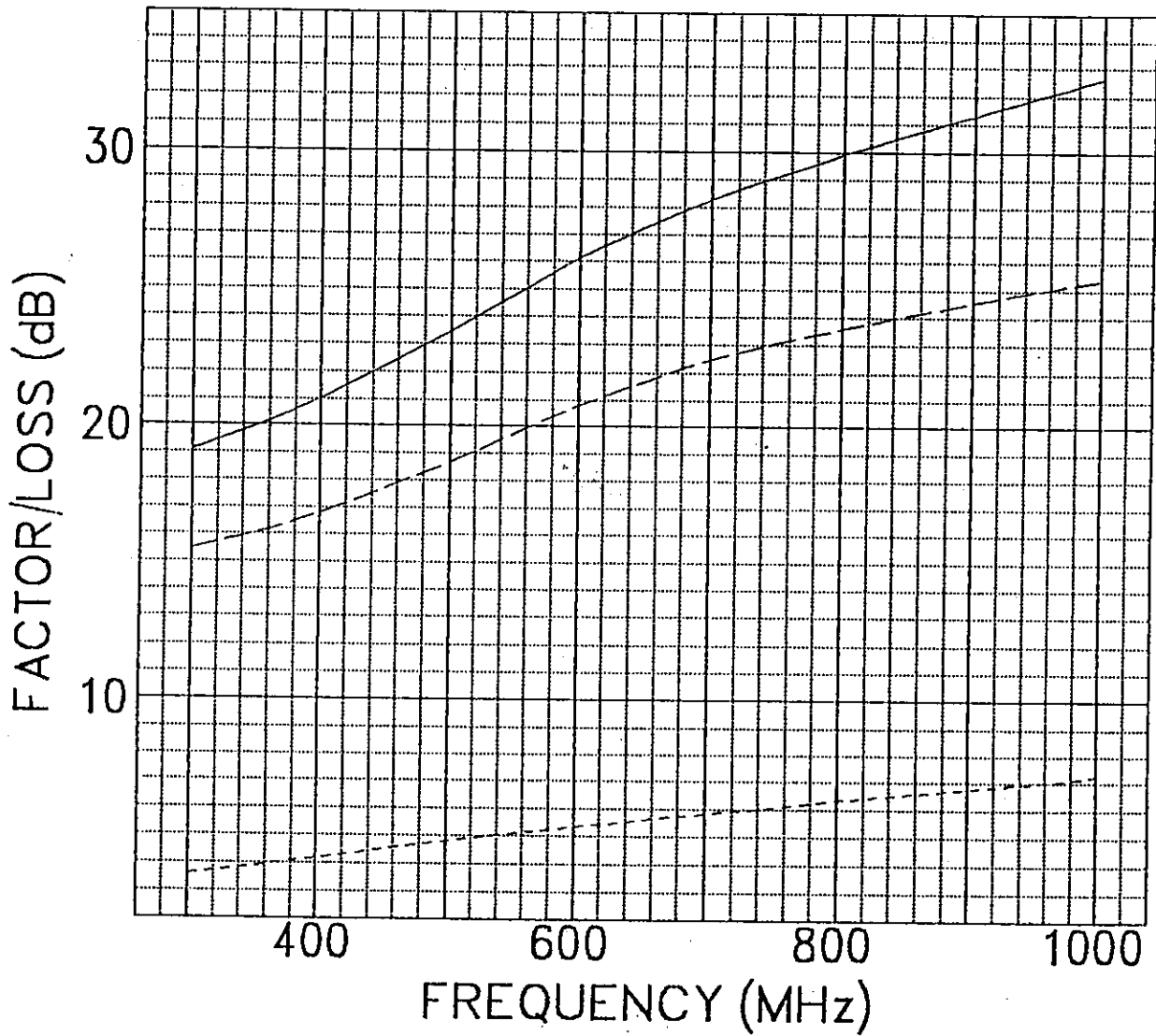
V : Correction Factor (dB)

———— : Correction Factor

----- : Antenna Factor

..... : Cable Loss

# CORRECTION FACTOR OF UHALP9107



$$E = V + K$$

E : Field Strength

V : Correction Factor (dB)

———— : Correction Factor

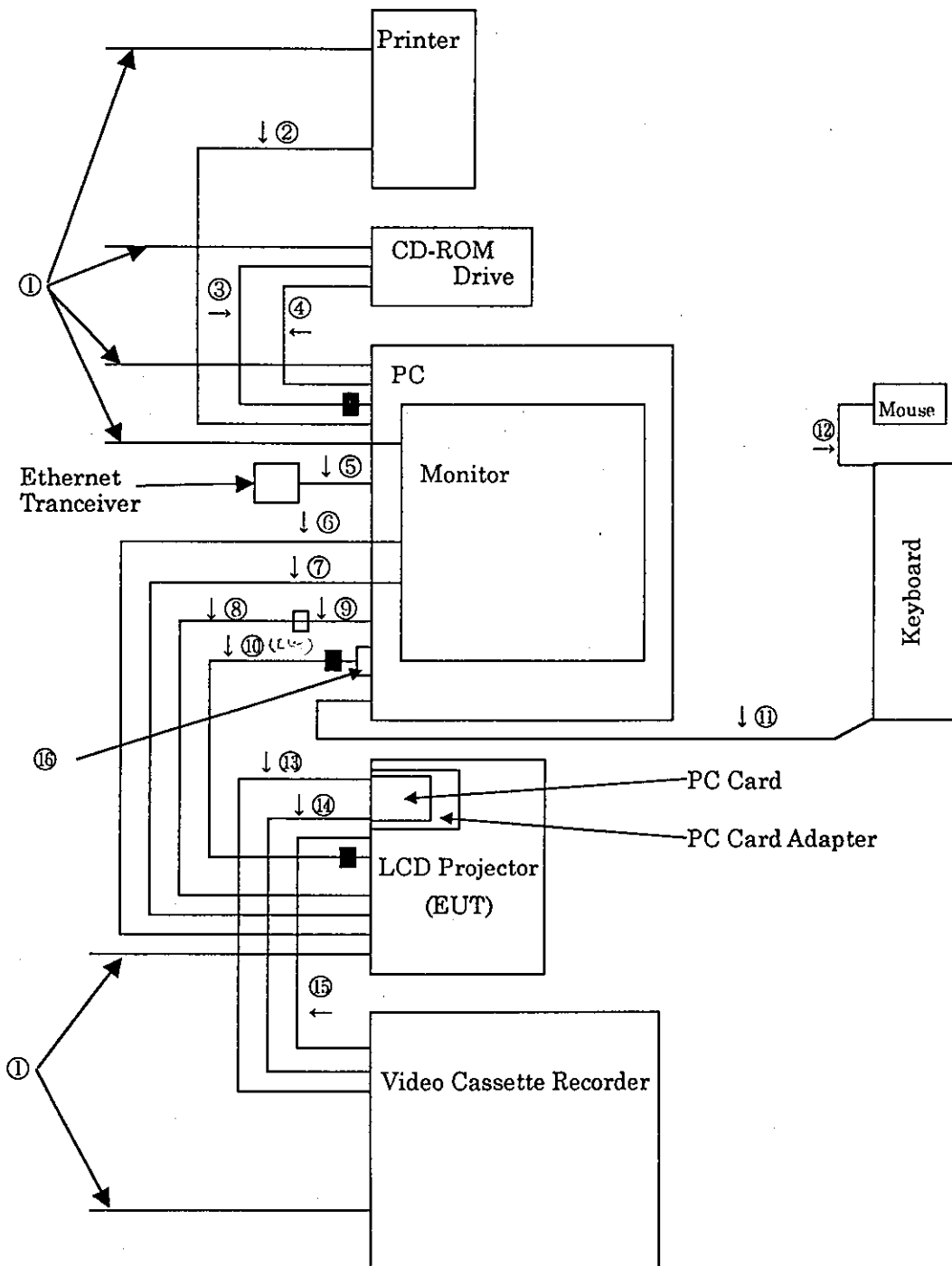
----- : Antenna Factor

..... : Cable Loss

Block Diagram of System for Measurements

EXHIBIT # : 3-2  
FCC ID : GSS99003  
OUR REF. : MKS98-F009  
MODEL NO. : VPRJ21452

Page 1/3





Type of Interface Cable

1. Power Cord
2. Printer Cable (2.0 m) : Shielded Cable ; Circular Cable
3. SCSI Cable (0.5 m) : Shielded Cable with a Ferrite Core ; Circular Cable
4. Audio Cable (1.9 m) : Shielded Cable
5. Tranceiver Cable (0.5 m) : Shielded Cable  
(Permanently attached to the Ethernet Tranceiver)
6. Audio Cable (2.0 m) : Shielded Cable
7. Monitor Cable (2.0 m) : Shielded Cable
8. RS-232C Cable (2.0 m) : Shielded Cable
9. RS-232C Mac Adaptor (0.2m) : Shielded Cable
10. VGA Cable (2.0 m) : Shielded Cable with Two Ferrite Cores (PROVIDED WITH EMT)
11. Keyboard Cable (0.9m) : Shielded Curl Cable  
(Permanently attached to the Keyboard)
12. Mouse Cable (0.8 m) : Shielded Cable  
(Permanently attached to the Mouse)
13. S-Video Cable (1.4 m) : Shielded Cable
14. Video Cable (1.4 m) : Shielded Cable
15. Audio Cable (1.4 m) : Shielded Cable
16. Mac Adaptor

Description

Computer (Certified Device)	Model No. : M9040 Trade Name : Apple FCC ID : BCGM9040	
Keyboard (Certified Device)	Model No. : M0487 Trade Name : Apple FCC ID : BCGM0487	
Mouse (Certified Device)	Model No. : M2706 Trade Name : Apple FCC ID : BCGM2706	
Printer (Certified Device)	Model No. : M2003 Trade Name : Apple FCC ID : BCGM2003	
Monitor (Certified Device)	Model No. : M2978 Trade Name : Apple FCC ID : BEJCA500	
Video Cassette Recorder (Certified Device)	Model No. : PV-S7680 Trade Name : Panasonic FCC ID : ACJ927104AHS	
CD-ROM Drive (Certified Device)	Model No. : M2918 Trade Name : Apple FCC ID : BCGM2918	
PC Card	Model No. : LSFA0005 Trade Name : Panasonic	} FLASH CARD
PC Card Adapter	Model No. : KXL-D55 Trade Name : Panasonic FCC ID : ACJ526KXL-602A	} PCMCIA ADAPTER
Ethernet Transceiver (Certified Device)	Model No. : M0437 Trade Name : Apple	
LCD Projector (Application Device)	Model No. : VPRJ21452 Trade Name : ViewSonic FCC ID : GSS99003	

EXHIBIT #

AUG 03 1998

EXHIBIT # : 4-1

FCC ID : GSS99003

OUR REF. : MKS98-F009

MODEL NO. : VPRJ21452

Page 1/2

Technical Specification

Power Supply	: Voltage	: AC 100 - 240 V, 50 / 60 Hz
	: Power Consumption	: 2.6-1.2 A
Video Input Signal	: NTSC Composite Video, 1 Vp-p, 75 ohms	
S-Video Input Signal	: Y (luminance signal), 1 Vp-p, 75 ohms	
	: C (chrominance signal), 0.286 Vp-p, 75 ohms	
RGB Input Signal	: RGB Analog (0.7 Vp-p, 1.0 Vp-p with sync on green, 75 ohms) Unlimited numbers of colors	
Video Signal	: RGB Analog (0.7 Vp-p, 1.0 Vp-p with sync on green, 75 ohms) Unlimited numbers of colors	
Sync Signal	: H/V separate, H/V composite, or Sync-on-Green	
H-Frequency	: 24.83 - 60.24 kHz (TTL Level)	
V-Frequency	: 56.25 - 85.1 Hz (TTL Level)	
Terminals	: S-Video Input	: Mini DIN 4-pin × 1
	: NTSC Video Input	: RCA pin × 1
	: Audio / Video Input	: RCA pin × 2 ( L + R )
	: Serial Port (RS-232C)	: Mini DIN 8-pin × 1
	: RGB Display Input	: D-Sub mini 15-pin × 1
	: RGB Audio Input	: M3 stereo mini pin × 1
	: RGB Display Output	: D-Sub mini 15-pin × 1
	: Audio Output	: M3 stereo mini pin × 1
	: PC Card Slot	: PCMCIA Type II × 1
Operating Temperature	: 41 ° F - 104 ° F ( 5 ° C - 40 ° C )	
Operating Humidity	: 10 % - 80 %	



List of Frequency

The CLOCK of LCD Projector

CIRCUIT Name	CLOCK
BALLAST	4.00 MHz
SYSTEM CONTROL	14.32 MHz
VIDEO SIGNAL	503 kHz
	3.58 MHz
PLL	14.30 MHz
LCD DRIVE TIMING CONTROL	36.00 MHz
PC CARD CONTROL	12.50 MHz

The CLOCK of PLL1/2 BLOCK

VIDEO SIGNAL		CLOCK (MHz)
VIDEO MODE	PAL	15.16
	SECAM	15.16
	PAL-N	15.16
	PAL-M	15.64
	NTSC	15.64
	NTSC4.43	15.64
RGB MODE	VGA @60Hz	25.18
	VGA @72Hz	31.50
	VGA @75Hz	31.50
	VGA @85Hz	36.00
	MAC 13"	30.24
	SVGA @56Hz	36.00
	SVGA @60Hz	40.00
	SVGA @72Hz	50.00
	SVGA @75Hz	49.50
	SVGA @85Hz	56.25
	MAC 16"	57.28
	XGA @60Hz	65.00
	XGA @70Hz	75.00
	XGA @75Hz	78.75
MAC 19"	80.00	
PC CARD MODE	—	38.00
NO SIGNAL	—	38.00

Device Operation Description

## Performance Explanation of LCD Projector

This projector is equipped with the function to project video images onto a large screen Using monitor signal from PCs or video signal from VCRs, etc.

And the audio signal from PC or VCR is output by projector's internal speaker.

The following describes how the video signal is processed.

1. Video signal which is input to S-VIDEO input terminal or VIDEO input terminal is supplied to Digital block after Video signal processing. In the digital block, in order to perform INTERLACE → Non-INTERLACE conversion, the signals are digitally processed and converted to RGB signal which is the same format as PC monitor signals. Then Synchronizing signals which are separated by video signal processing circuit is supplied to LCD drive timing control circuit and system control circuit.
2. One of the RGB signals mentioned above, or the monitor signal which is supplied to monitor input terminal from a PC, is selected and processed and then supplied to digital block as RGB signal. After that the signal is supplied to block gamma correction. Synchronizing signal, which is produced by the Synchronizing signal processing is added to LCD drive timing control circuit and system control circuit.
3. Synchronizing signal, which is supplied to each circuit, is used to process synchronization of system control and LCD drive.
4. PLL oscillation clock of LCD drive timing control circuit and OSD clock which is supplied to signal process circuit are adjusted to the proper frequency for each PC by the system control circuit which distinguishes the input Synchronizing signal.
5. In the PC Card block, JPEG data of ATA Flash Card is read out, JPEG Expansion is done, then it is converted to RGB data. And Storing it in the frame memory of Digital Block makes it a still (frozen) image.