

DISPLAY MONITOR DIVISION
AVC COMPANY
MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.

1997.12.15

REV-000

ENGINEERING SPECIFICATIONS (TENTATIVE)

TX-D5L31F (HL3F 15") DIGITAL MULTI-SCAN CHASSIS

<FEATURES>	(1) STEREO SPEAKERS FOR HIGH QUALITY STEREO SOUND (2) USB function in the pedestal : Upstream 1, Downstream 4 (3) 1024 x 768 RESOLUTION MAX. WITH EQUIVALENT OF 16.2 MILLION COLORS (4) MULTI-SCANNING FROM 30kHz TO 61kHz (5) HIGH CONTRAST WITH 200:1, HIGH BRIGHTNESS WITH 250 cd/m ² (6) WIDE VIEWING ANGLE (R/L : $\pm 70^\circ$, UP : 40° , DOWN : 60°) (7) FAST RESPONSE (30ms) SUITABLE FOR MOTION PICTURES (8) ON-SCREEN DISPLAY CONTROL (5 LANGUAGES) (9) FULL-SCREEN DISPLAY BETWEEN VGA AND XGA (10) CLEAR CHARACTERS AND GRAPHICS BY ORIGINAL PIXEL TRANSFORMATION (11) BACK LIGHT WITH A LIFE SPAN OF 50,000 HOURS (TYP.) (12) UPGRADED AUTO SIZE FUNCTION
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[1] PANEL :	TYPE COLOR FILTER SURFACE OPTICAL RESPONSE CONTRAST RATIO	15.0" TFT Active Matrix, Pixel Pitch 0.297mm RGB Vertical Stripe Anti-Glare Hard Coat 30ms (typ.) 200 : 1 (typ.)
[2] INPUT SIGNAL :	VIDEO SYNC PRESET MODES AUDIO	RGB Analog (75 Ω , 0.7/1.0Vp-p) H/V Separate (TTL) fH = (24) 30~61kHz, fV = 50~77Hz 1024 x 768 (Non-I/L), etc. / Factory : 16 USER : 6 TBD Vrms (max.) (TBD k Ω typ.)
[3] CONNECTOR :	VIDEO IN AUDIO IN HEADPHONE OUT USB POWER (USB) POWER (Monitor)	15Pin mini D-Sub (IBM PS/2 Compatible) 3.5mm Mini Jack (stereo) 3.5mm Mini Jack (stereo) Upstream : 1, Downstream : 4 Jack x 2 3-Pin Plug (CEE22)
		_____ <Rear> _____ _____ <Front> _____ <Pedestal> _____ <Rear, Ped.> _____ <Rear>
[4] POWER :	VOLTAGE CONSUMPTION POWER SAVE	90~132, 198~264Vac (Auto-switching) 65W (typ.) VESA STANDARD (DPMS)
[5] CONTROLS :	SIDE FRONT OSD	Power On/Off Audio Volume (Up and Down), Audio Mute Contrast, Brightness, Back Light, H/V Size, H/V Position, Color, Video Level, Recall, Disp Frequency, Language, H.Finetune, V.Finetune, Auto Size, OSD position
[6] MAX. BRIGHTNESS :		250 cd/m ² (typ.) at White Flat Field
[7] DISPLAY AREA :		304(H) x 228(V) mm (typ.)
[8] OPERATING CONDITION :	TEMPERATURE HUMIDITY	0~35°C 5~90% (Non-condensation)
[9] DIMENSIONS :		385(W) x 391(H) x 200(D) mm
[10] WEIGHT :		6.7kg (typ.) (Net)
[11] SAFETY/REGULATIONS :		UL, CSA, TUV/GS, NORDIC, FCC-B, IC-B, CISPR-B, MPR II, TCO'92/'95, CE
[12] AUDIO :		1W x 2 Speakers
[12] USB :		Upstream : 1, Downstream : 4

6.3 STANDARD TIMING

Following 15 modes are reserved in the memory as standard timings at the factory. But the best adjustment conditions are different due to the characteristics of each video board in your Computer. Please re-adjust for your Computer.

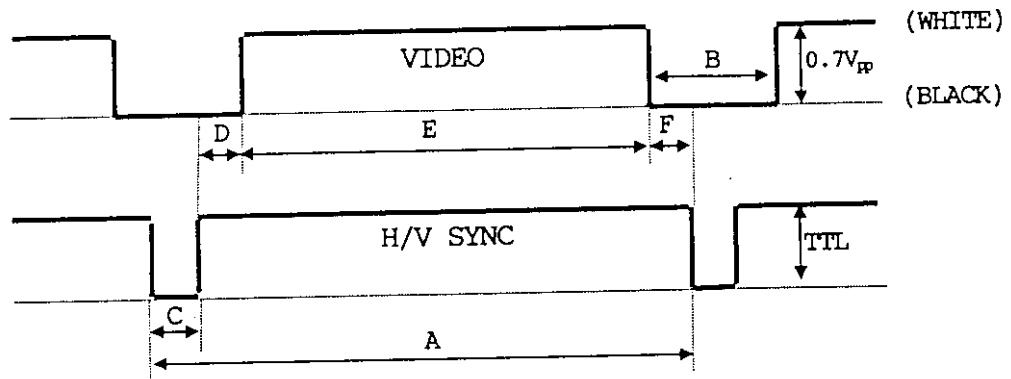
Fig-1 shows a definition of timing and signal level.

Electrical performance is specified based on 1024x768 mode unless otherwise mentioned.

Fig-1:TIMING CHART

< HORIZONTAL / VERTICAL >

A: Period
B: Blanking
C: Sync Width
D: Back Porch
E: Active
F: Front Porch



RESERVATION TIMING

		MODE 1	MODE 2	MODE 3	MODE 4
		VGA480(Industry STD) 640×480 @60Hz	VGA400(Industry STD) 640×400 @70Hz	YESA Standard 640×480 @72Hz	MAC 13 640×480 @67Hz
DOT CLOCK		25.1745MHz	25.1745MHz	31.500MHz	30.2410MHz
HORIZONTAL	FH	31.4681kHz	37.861kHz	35.0012kHz	31.4681kHz
	A-Period	31.778 us(800 dots)	26.413 us(832 dots)	28.570 us(864 dots)	31.778 us(800 dots)
	B-Blanking	6.355 us(160 dots)	6.096 us(192 dots)	7.407 us(224 dots)	6.355 us(160 dots)
	C-Sync width	3.813 us(96 dots)	1.270 us(40 dots)	2.083 us(63 dots)	3.813 us(96 dots)
	D-Back porch	1.907 us(48 dots)	4.063 us(128 dots)	3.241 us(98 dots)	1.907 us(48 dots)
	E-Active	25.423 us(640 dots)	20.317 us(640 dots)	21.163 us(640 dots)	25.423 us(640 dots)
	F-Front porch	0.636 us(16 dots)	0.762 us(24 dots)	2.083 us(63 dots)	0.636 us(16 dots)
VERTICAL	FV	59.9393Hz	72.8088Hz	66.6689Hz	70.0849Hz
	A-Period	16.684 ms(525 lines)	13.735 ms(520 lines)	15.000 ms(525 lines)	14.268 ms(449 lines)
	B-Blanking	1.430 ms(45 lines)	1.057 ms(40 lines)	1.286 ms(45 lines)	1.557 ms(49 lines)
	C-Sync width	0.064 ms(2 lines)	0.079 ms(3 lines)	0.086 ms(3 lines)	0.064 ms(2 lines)
	D-Back porch	1.049 ms(33 lines)	0.740 ms(28 lines)	1.114 ms(39 lines)	1.112 ms(35 lines)
	E-Active	15.254 ms(480 lines)	12.678 ms(480 lines)	13.714 ms(480 lines)	12.711 ms(400 lines)
	F-Front porch	0.318 ms(10 lines)	0.238 ms(9 lines)	0.086 ms(3 lines)	0.381 ms(12 lines)
Sync polarity (H/V)		Negative / Negative	Negative / Positive	Negative / Negative	Negative / Negative

Note: The aspect ratio of MODE 2 is not 4:3, but display image of these timings is expanded into the full size (Aspect Ratio 4:3).

RESERVATION TIMING

		MODE 5	MODE 6	MODE 7	MODE 8
		VESA Standard 640×480 @75Hz	VESA Standard 800×600 @56Hz	VESA Proposal (SYGA) 800×600 @60Hz	VESA Proposal 800×600 @75Hz
DOT CLOCK		31.5000MHz	36.000MHz	40.0000MHz	49.5000MHz
H O R I Z	fH	37.500kHz	37.8788kHz	46.875kHz	35.1562kHz
	A-Period	26.667 us(840 dots)	26.400 us(1056 dots)	21.333 us(1056 dots)	28.444 us(1024 dots)
	B-Blanking	6.350 us(200 dots)	6.400 us(256 dots)	5.171 us(256 dots)	6.222 us(224 dots)
	C-Sync width	2.032 us(64 dots)	3.200 us(128 dots)	1.616 us(80 dots)	2.000 us(72 dots)
	D-Back porch	3.810 us(120 dots)	2.200 us(88 dots)	3.232 us(160 dots)	3.556 us(128 dots)
	E-Active	20.317 us(640 dots)	20.000 us(800 dots)	16.162 us(800 dots)	22.222 us(800 dots)
	F-Front porch	0.508 us(16 dots)	1.000 us(40 dots)	0.323 us(16 dots)	0.667 us(24 dots)
V E R T	fV	75.000Hz	60.3165Hz	75.0000Hz	56.250Hz
	A-Period	13.333 ms(500 lines)	16.579 ms(628 lines)	13.333 ms(625 lines)	17.778 ms(625 lines)
	B-Blanking	0.533 ms(20 lines)	0.739 ms(28 lines)	0.533 ms(25 lines)	0.711 ms(25 lines)
	C-Sync width	0.080 ms(3 lines)	0.106 ms(4 lines)	0.064 ms(3 lines)	0.057 ms(2 lines)
	D-Back porch	0.427 ms(16 lines)	0.607 ms(23 lines)	0.448 ms(21 lines)	0.626 ms(22 lines)
	E-Active	12.800 ms(480 lines)	15.840 ms(600 lines)	12.800 ms(600 lines)	17.067 ms(600 lines)
	F-Front porch	0.027 ms(1 lines)	0.026 ms(1 lines)	0.021 ms(1 lines)	0.028 ms(1 lines)
Sync polarity (H/V)		Negative / Negative	Positive / Positive	Positive / Positive	Positive / Positive

		MODE 9	MODE 10	MODE 11	MODE 12
		VESA Proposal 800×600 @72Hz	MAC16 832×624 @75Hz	VESA Standard 1024×768 @60Hz	VESA Standard 1024×768 @70Hz
DOT CLOCK		50.0000MHz	57.2832MHz	65.0000MHz	75.0000MHz
H O R I Z	fH	48.0769kHz	48.3631kHz	56.4759kHz	49.7250kHz
	A-Period	20.800 us(1040 dots)	20.677 us(1344 dots)	17.707 us(1328 dots)	20.111 us(1152 dots)
	B-Blanking	4.800 us(240 dots)	4.923 us(320 dots)	4.054 us(304 dots)	5.587 us(320 dots)
	C-Sync width	2.400 us(120 dots)	2.092 us(136 dots)	1.813 us(136 dots)	1.117 us(64 dots)
	D-Back porch	1.280 us(64 dots)	2.462 us(160 dots)	1.920 us(144 dots)	3.910 us(224 dots)
	E-Active	16.000 us(800 dots)	15.754 us(1024 dots)	13.653 us(1024 dots)	14.524 us(832 dots)
	F-Front porch	1.120 us(56 dots)	0.369 us(24 dots)	0.320 us(24 dots)	0.559 us(32 dots)
V E R T	fV	72.1876Hz	60.0038Hz	70.0694Hz	74.5502Hz
	A-Period	13.853 ms(666 lines)	16.666 ms(806 lines)	14.272 ms(806 lines)	13.414 ms(667 lines)
	B-Blanking	1.373 ms(66 lines)	0.786 ms(38 lines)	0.673 ms(38 lines)	0.865 ms(43 lines)
	C-Sync width	0.125 ms(6 lines)	0.124 ms(6 lines)	0.106 ms(6 lines)	0.060 ms(3 lines)
	D-Back porch	0.478 ms(23 lines)	0.600 ms(29 lines)	0.513 ms(29 lines)	0.784 ms(39 lines)
	E-Active	12.480 ms(600 lines)	15.880 ms(768 lines)	13.599 ms(768 lines)	12.549 ms(624 lines)
	F-Front porch	0.770 ms(37 lines)	0.062 ms(3 lines)	0.053 ms(3 lines)	0.020 ms(1 lines)
Sync polarity (H/V)		Positive / Positive	Negative / Negative	Negative / Negative	Negative / Negative

RESERVATION TIMING

		MODE 13	MODE 14	MODE 15
		1024×768 @72Hz	VESA Standard 1024×768 @75Hz	MAC 19 1024×768 @75Hz
DOT CLOCK		75.0000MHz	78.7500MHz	80.0000MHz
H O R I Z	fH	57.8703kHz	60.241kHz	60.0229kHz
	A-Period	17.280 us(1296 dots)	16.600 us(1328 dots)	16.660 us(1312 dots)
	B-Blanking	3.627 us(272 dots)	3.800 us(304 dots)	3.657 us(288 dots)
	C-Sync width	1.920 us(144 dots)	1.200 us(96 dots)	1.219 us(96 dots)
	D-Back porch	1.387 us(104 dots)	2.200 us(176 dots)	2.235 us(176 dots)
	E-Active	13.653 us(1024 dots)	12.800 us(1024 dots)	13.003 us(1024 dots)
	F-Front porch	0.320 us(24 dots)	0.400 us(32 dots)	0.203 us(16 dots)
V E R T	fV	71.7978Hz	74.927Hz	75.0286Hz
	A-Period	13.928 ms(806 lines)	13.346 ms(804 lines)	13.328 ms(800 lines)
	B-Blanking	0.657 ms(38 lines)	0.597 ms(36 lines)	0.533 ms(32 lines)
	C-Sync width	0.104 ms(6 lines)	0.049 ms(3 lines)	0.050 ms(3 lines)
	D-Back porch	0.501 ms(29 lines)	0.498 ms(30 lines)	0.466 ms(28 lines)
	E-Active	13.271 ms(768 lines)	12.749 ms(768 lines)	12.795 ms(768 lines)
	F-Front porch	0.052 ms(3 lines)	0.049 ms(3 lines)	0.017 ms(1 lines)
Sync polarity (H/V)		Negative / Negative	Positive / Positive	Negative / Negative

FACTORY CONTROL NO. : FVD-98-F011

FCC ID : ACJ93312135

Supplementary Information

1. These models : TX-D5L31NMF and TX-D5L31F are 15" Color LCD display monitors which are designed to be used as the video terminal for a personal computer, and has no TV tuner.
2. The statement required in the section 15.19 is marked in the nameplate.
3. The warning statement required in the section 15.21, 15.27 and 15.105(b) indicated in the draft operating instruction manual enclosed in the same carton.

Please refer to the draft of the attached operating instruction manual.
4. TX-D5L31NMF employs the detachable signal connecting cable for D-sub with two ferrite cores, the detachable power supply cord without ferrite core, the detachable USB cable and the detachable audio cable.
5. Differences between Model Nos. TX-D5L31NMF and TX-D5L31F are only brand name.