

SHARP CORPORATION

SPECIFICATIONS FOR

LCD DISPLAY

MODEL 64L-U7E

LCD Visual Sys. 2nd Eng. Dept.

部 長	主 査	係 長	担 当
			

Modification History

Feb. 10 ,1997

SHARP CORPORATION
SPECIFICATION FOR LCD DISPLAY MONITOR

GENERAL SPECIFICATION

MODEL : 64L-U7E

1. Input signal	NTSC Video signal Analog RGB signal (Horizontal scan rate 15.734 kHz)
2. Power voltage	DC 10.5 V ~ 12.0 V
3. Power consumption	7 W at DC 12.0V
4. Viewing area Dimension	Diagonal 161.2 mm 6.4 “ Width 130.6 mm Height 94.5 mm
5. Appropriate Viewing angle	6 O'clock
6. Dimensions (Approx.)	168 (W) x 123 (H) x 31 (D) mm
7. Weight (Approx.)	400 g
8. LCD Display Panel	TFT Active Matrix 449,280 Dots (1,920 H x 234 V) Stripe arrangement
9. Back light	Cold Cathode Fluorescent Tube W-Shaped Lamp Direct Lighting System
10. Semiconductors (except LCD panel)	ICs 13 pcs. Transistors 17 pcs. Diodes 18 pcs.
11. Standards	
Safety standards	UL 1492 under consideration
EMI standards	Fcc under consideration

12.External terminal

Connector	A1	H-SYNC OUTPUT (Internal horizontal sync. signal)
	A2	V-SYNC OUTPUT (Internal Vertical sync. signal)
	A3	+5V OUTPUT
	A4	TEST1
	A5	TEST2
	A6	Color adjustment signal
	A7	Brightness adjustment signal
	A8	Tint adjustment signal
	A9	Dimming adjustment signal
	A10	GND
	A11	Video Input (NTSC Composite video signal)
	A12	GND
	A13	Red Signal Input (Analog RGB signal)
	A14	GND
	A15	Green Signal Input (Analog RGB signal)
	A16	GND
	A17	Blue Signal Input (Analog RGB signal)
	A18	GND
	A19	Ys Input (Note1)
	A20	Super Impose (Note2)
	A21	N.C.
	A22	C-Sync Input (Analog RGB signal)
	A23	GND
	A24	GND (for Signal Circuit)
	A25	+12 V Input (for Signal Circuit)
	A26	+12 V Input (for Inverter)
	A27	+12 V Input (for Inverter)
	A28	GND (for Inverter)

Connector manufacture Molex

Connector name 52271-2817
1.0 mm pitch 28 poles
Contact side Lower

(Note1)	Video Mode	RGB Mode
(A19)	GND	High Level
(Note2)	Normal	Superimpose Mode
(A20)	Open	GND

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ENGINEERING SPECIFICATION

MODEL : 64L-U7E

1. General	Nominal	Limit
1) Power Voltage	DC 12.0 V	10.5 V to 12.0 V
2) Operating temperature Range (without cabinet of customer)	25°C	-10°C to 60°C
3) Storage temperature Range		-20°C to 80°C
4) Power Consumption(DC 12.0 V Nominal)		<u>7.0 W ± 20 %</u>
2. Video output characteristics		
1) Video output(at tint, color and brightness control center position with standard half color bars signal)		2.7 V p-p±0.7Vpp
2) Video fidelity(at 100kHz standard , NTSC video signal)		
1 MHz	± 0.5 dB	
2 Mhz	± 0.1 dB	
3 MHz	- 10.0 dB	
3.58MHz	- 25.0 dB	
3. Picture quality		
1) Resolution(ITC pattern , NTSC video signal)		
Horizontal center	220 lines	180 lines min.
corner	220	180
Vertical center	220	180
corner	220	180
2) Step response		
rising edge time		500 ns max.
pre shoot		20 % max.
over shoot		20 % max.
3) ACC characteristics		
ACC (at chroma output level -6 dB)		0 dB

4. Chroma Section

1) Color control range (for information only)		4 dB min.
2) Tint control range (for information only)		
To green	30°	12° min.
To purple	30°	12° min.
3) Tint stability (for information only)		
Tint drift	3°	12° max.
Tint shift	3°	12° max.
4) Color killer	-30 dB	-20 dB max.

5. Liquid crystal display

1) Viewing area		
Diagonal	161.2 mm	
Width	130.6 mm	
Height	94.5 mm	
2) Number of dots	449,280 dots (640 x 3 x 234)	
3) Pitch of dots		
Horizontal	68 μm	
Vertical	202 μm	
4) Pixels arrangement	RGB stripe arrangement	
5) Contrast (best viewing position)		1:60 min.
6) Response time(at 25 °C)		100 msec max.
7) Viewing angle (at contrast 1:10 min.)		
Left / Right		-45°/45° min.
Up / Down		10 °/ - 30 ° min.
note: at 6 o'clock viewing mode		
8) Over scanning (at NTSC video signal input , information only)		
Horizontal	4 %	
Vertical	2 % (Upper side)	
	3 % (Down side)	
9) Brightness (at 25 °C, after 30 minutes warming up, at DC 12V, at 100% white video signal, at no dimming mode)		
	220 cd/m ²	120 cd/m ² min.
10) Whole light through rate	3.4 %	2.8 % min.
11) Dimming range		100~15%

6. Input signal requirement

- 1) NTSC Video signal (standard signal : luminance order color barsignal with 100% white peak level)

Input level	1.0 V p-p	1.0 V p-p $\pm$ 0.2 V
Input impedance		75 Ω $\pm$ 10 %

- 2) Analog RGB signal

Input level	0.7 V p-p	0.7 V p-p $\pm$ 20 %
Input impedance		75 Ω $\pm$ 10 %

- 3) Composite sync. signal (RGB signal input)

input level	TTL level (negative polarity)
Horizontal frequen	15.734Khz $\pm$ 200Hz
Vertical frequen	60Hz $\pm$ 5Hz

- 4) Ys signal (A19 terminal)

input level	L : 0 ~ 0.8 V H : 3.5 ~ 5.3 V
input impedance	10 k Ω min.

- 5) Superimpose signal (A20 terminal)

input level	L : 0 ~ 0.8 V H : 3.5 ~ 5.3 V
input impedance	10 k Ω min.

- 6) Other input signals (picture adjustements)

Terminal #	Terminal Name	Min.	Typ.	Max.
A9	Dimming control	1.6 V		4.6 V
A7	Brightness control	2.2 V	3.0 V	4.0 V
A6	Color control	1.7 V	3.1 V	4.4 V
A8	Tint control	2.1 V	3.2 V	4.4 V

7) Output signals requirement

+ 5.0 V output (A3 terminal)

Output voltage level

5.3V $\pm$ 10 %

Maximum output current

10 mA Max.

HSY signal (A1 terminal), VSY signal (A2 terminal)

Output level

TTL level

Output current

$\pm$ 20 mA

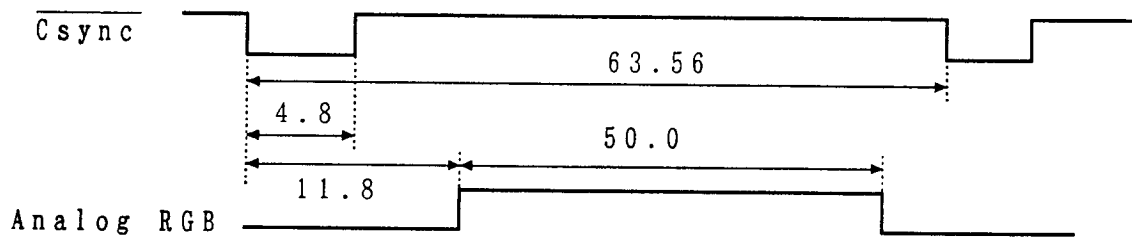
Signal polarity

Negative

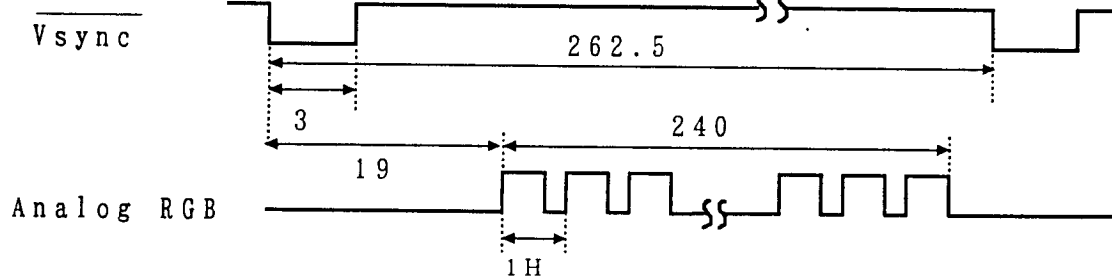
8. Signal input timing(H-sync:micro second,V-sync:# of lines)

(1) Analog RGB mode

<H period>

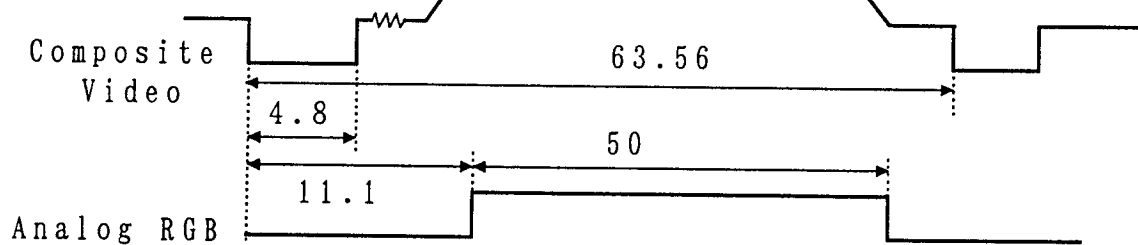


<V period>

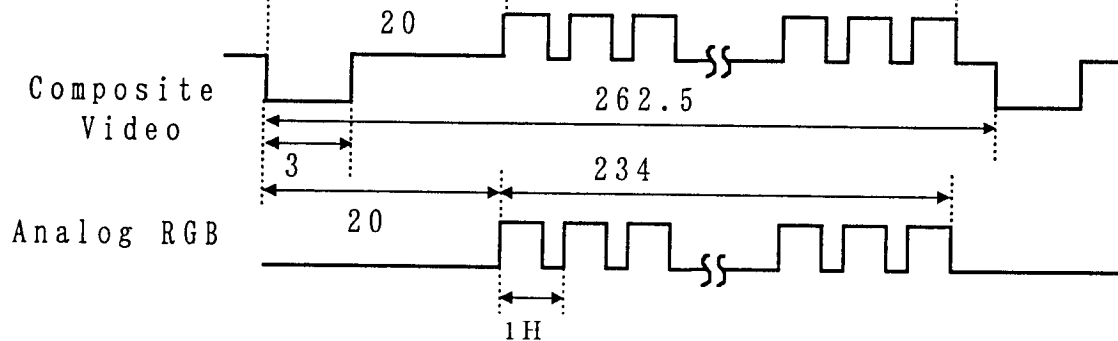


(2) Superimpose

<H period>



<V period>



RELIABILITY TEST

MODEL : 64L-U7E

It is required that LCD chassis unit should be designed to comply with all the following reliability test.

1. Drop test

Drop off the carton, against the floor with 1 corner, 3 edges and 6 surfaces from the height of 60cm.

The floor should be flat surface with horizontal position and made of concrete, rock, steel plate or equivalent.

After drop test, the unit should have no safety hazard and operate as normal usage without any damage.

2. Vibration test

- 1) Conduct the following vibration test with the carton, should operate as normal usage without any damage after this test.

Frequency(Hz)	:	5 to 50
1 cycle period	:	3 minutes(back and force)
Acceleration	:	1.5G each (X.Y.Z)
Securement	:	Banding
Time	:	Up/Down 60 minutes

Forward/Back	15 minutes
Right/Left	15 minutes

- 2) Endurance vibration test

Conduct the following vibration test with the chassis unit and should operate as normal usage without any damage after this test.

Frequency(Hz)	:	10 to 200
Acceleration	:	2.5G each (X.Y.Z)
1 cycle period	:	20 minutes
Securement	:	Screw
Time	:	Up/Down 4 hours
		Forward/Back 2 hours
		Right/Left 2 hours

3. Pressure reduction test

Set up the unit in the pressure reduction chamber and reduce the air pressure gradually from the normal pressure to 510hPa(380mmHg) which is equivalent to 5,000m height. There should have no damage to turn on the unit with 10% increased power voltage for 30 minutes and repeat power on and off for 3 times quickly.

4. High temperature storage(without power)

Keep the unit in 80°C temperature chamber for 72 hours without power.
Take out the unit to make it normal temperature and make sure that the unit has no safety hazard and operate as normal usage without any damage.

5. Low temperature storage(without power)

Keep the unit in -20°C temperature chamber for 72 hours without power.
Take out the unit to make it normal temperature and make sure that the unit has no safety hazard and operate as normal usage without any damage.

6. Humidity test(with power)

Operate the unit in 40°C temperature and 90thru 95% humidity chamber for 90 hours with $\pm 10\%$ increased power.
Make sure that the unit has no safety hazard and operate as normal usage without any damage.

7. High temperature test(with power)

Operate the unit for 72 hours with $\pm 10\%$ increased power after keeping the unit in 60°C temperature chamber for 2 hours.
Make sure that the unit has no safety hazard and operate as normal usage without any damage.

8. Low temperature test(with power)

Operate the unit for 72 hours with $\pm 10\%$ increased power after keeping the unit in -10°C temperature chamber for 2 hours.
Make sure that the unit has no safety hazard and operate as normal usage without any damage.

9. Electrostatic discharge test

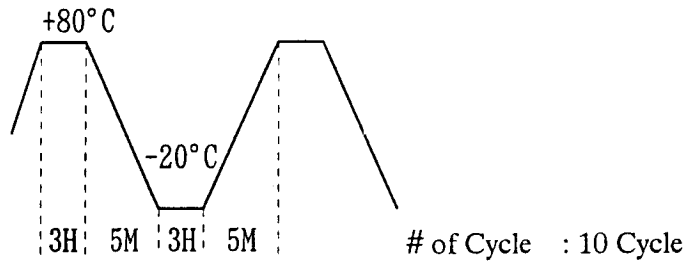
Discharge DC8kV under operating, DC15kV under non operating to chassis angle for 10 times of 1 second interval with 500 Ω , 200pF prove.

- Under operating : The unit should operate without any trouble during operation.
- Under non operating : No component damage
- exception : This will not be applied when the unit recovered from the trouble after powering it off and then on.
This test will not be applied to In/Out connector terminal.

10. Thermal shock test

Keep the unit in the following temperature chamber without power.

Take out the unit to make it normal temperature and make sure that the unit has no safety hazard and operate as normal usage without any damage.



64L-U7E HANDLING PRECAUTIONS

1. Cable Connection

- 1) Turn off the power to the LCD Display before connecting or disconnecting a cable.

2. Installation

- 1) For mounting , Please refer attached drawing .
- 2) When the 64L-U7E panel is to be installed directly on the equipment's surface, use the panel's metallic area for installation. If the panel surface is in direct contact with the equipment surface, the resulting stress may damage the panel or cause it to deteriorate.

3. Cautions for Installation

- 1) Handling the polarizing plate requires the utmost care, as it is easily damaged. To prevent possible damage or contamination, the plate's surface is protected with a protective film (lamination).
- 2) Cautions for removing the lamination

When removing the lamination from the polarizing plate surface, observe the following cautions. Pay special attention to static electricity.

A. Working Environment

To prevent damage from static electricity, the following working environment is recommended:

- The floor should have a conductive surface (conductive mat or paint) or more than $1\text{M } \Omega$ resistance.
- The room should be isolated from the outdoor air, and have an adhesive mat at its entrance to clean shoes.
- The ambient atmosphere should be 15 to $27\text{ }^{\circ}\text{C}$, 50% to 70% RH.
- The operator should wear conductive shoes, conductive work clothes, conductive gloves, and grounding wrist straps.

B. Work Procedure

- The deionizing blower should be oriented a little downward. Keep it within 20 cm of the LCD panel. (see Fig.1)

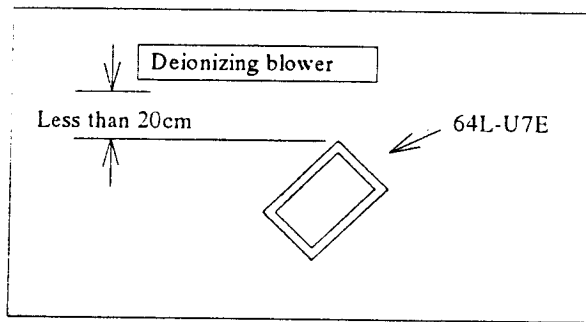


Fig. 1

- To protect the polarizing plate from possible damage, stick adhesive tape (plastic tape, etc.) on the corner of the lamination closest to the blower. (see Fig. 2)

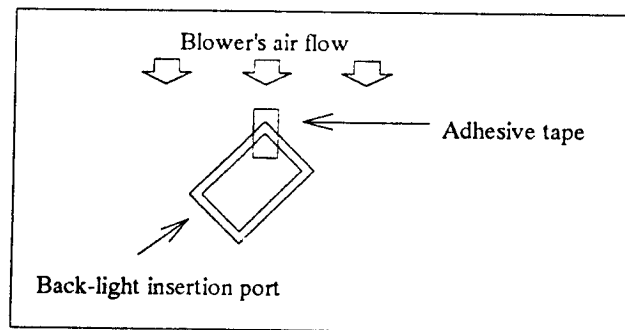


Fig. 2

- Gently and slowly remove the lamination while pulling the adhesive tape forward (take more than 5 seconds for this work).
 - After removing the lamination, immediately go to the next process before the panel gathers dust.
- 3) Cleaning dust off the polarizing plate surface
 - Blow dust off the polarizing plate surface with an N_2 blower with anti-static treatment. Use of an ionized air gun (from Hugel Electronics co.) is recommended.
 - The polarizing plate surface is so sensitive that it should not be wiped with a cleaning cloth. If it gathers dust, use adhesive plastic tape to pick it up.
 - 4) Contaminants on the shield casing or other metallic areas should be wiped off with a soft, dry cloth.
 - 5) Water drips or fingerprints, if left on the panel surface for long time period, may cause discoloration or spots. They should be cleaned off as soon as possible.
 - 6) The LCD panel is made of glass. Carefully protect it from hard jolts.
 - 7) The LCD module uses CMOS ICs. Operators should properly ground themselves to prevent possible electrostatic damage.

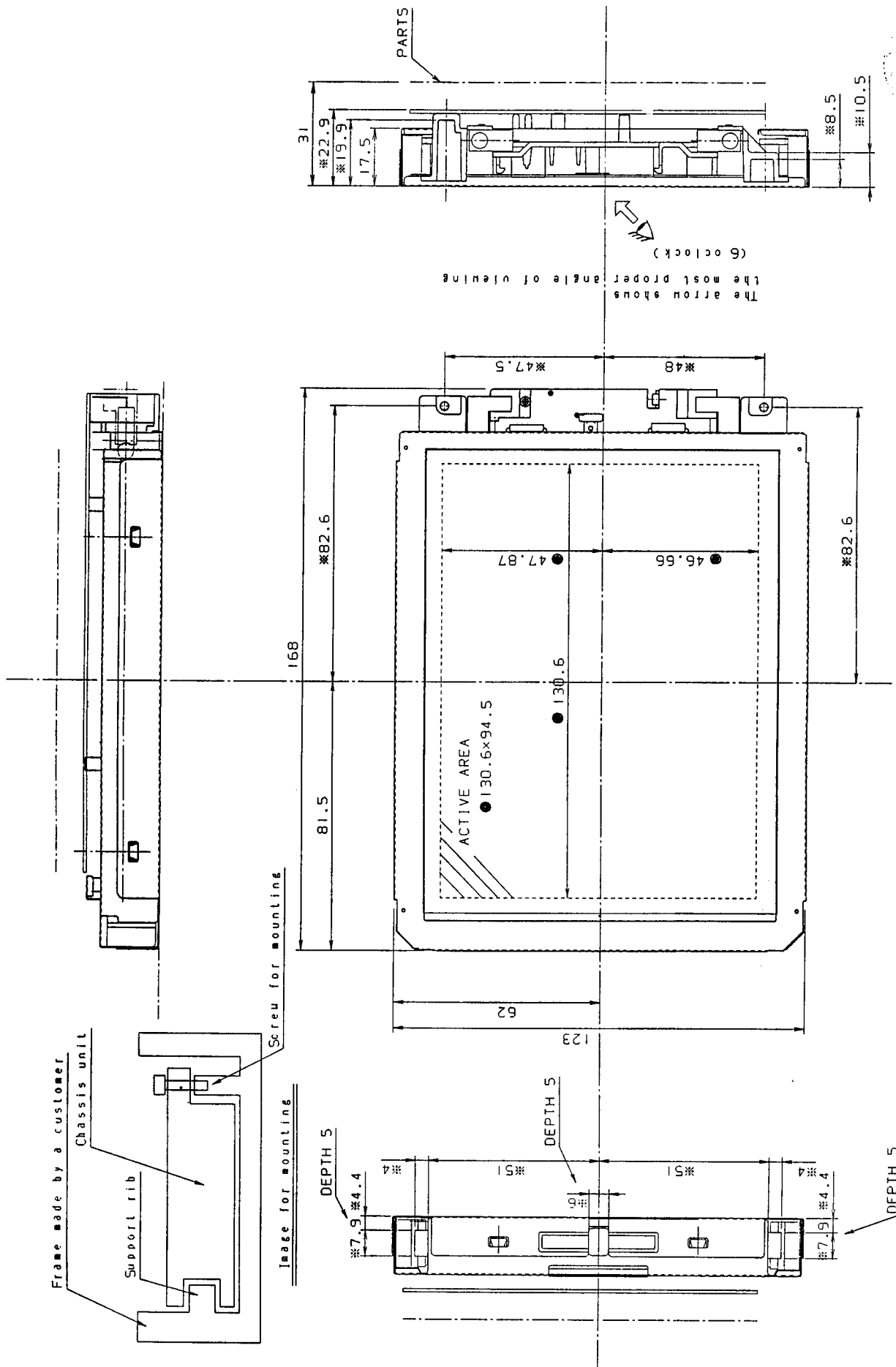
4. Precautions for Alignment

The LCD module and its driver board are adjusted as an integrated unit. If either the module or the driver board is replaced, readjustment will be required. Misalignment will do harm to performance and / or reliability.

5. Miscellaneous

- 1) Do not leave the LCD panel in direct sunlight or strong ultraviolet light for very long.
- 2) At temperatures below the rated storage temperature, the liquid crystal inside the panel may be freeze and damage the cells. At temperatures above the rated storage temperature, the liquid crystal may irreversibly turn into an isotropic liquid. We strongly advise that the LCD panel be stored at close to normal room temperature.
- 3) If the LCD panel is cracked and the liquid within spills, take care not to swallow it. If your hands or clothing become stained with the liquid, immediately clean it off with soap and water.
- 4) Do not let the monitor constantly display a fixed image for long time, as it may leave an afterimage. In the worst case, the liquid crystal may suffer permanent burn-in damage.
- 5) Also observe general precautions for handling electronic parts.

Note) The content of this section is subject to change without prior notice.



64L-U7E

Dimensions with mark are important for mounting

TOLERANCE OF DIMENSION IS ± 0.5

NTSC, TFT, LCD, AV, 64LU7E