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| | | APPLICABLE GROUP Liquid Crystal Display Group |

DEVICE SPECIFICATION FOR
TFT-LCD Module
 MODEL No.
LQ10D32A

CUSTOMER'S APPROVAL

DATE _____

BY _____

PRESENTED

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SHARP CORPORATION

1. Application

This specification applies to color TFT-LCD module, LQ10D32A.

2. Overview

This module is a color active matrix LCD module incorporating amorphous silicon TFT (Thin Film Transistor). It is composed of a color TFT-LCD panel, driver ICs, control circuit and power supply circuit and a backlight unit. Graphics and texts can be displayed on a 640 × 3 × 480 dots panel with 262,144 colors by supplying 18 bit data signal (6bit/color), four timing signals, +5V DC supply voltage for TFT-LCD panel driving and supply voltage for backlight.

The TFT-LCD panel used for this module is a low-reflection and higher-color-saturation type. Therefore, this module is also suitable for the multimedia use.

Optimum viewing direction is 6 o'clock.

Backlight-driving DC/AC inverter is not built in this module.

3. Mechanical Specifications

| Parameter | Specifications | Unit |
|----------------------------|--|-------|
| Display size | 26 (10.4") Diagonal | cm |
| Active area | 211.2(H) × 158.4(V) | mm |
| Pixel format | 640(H) × 480(V) | pixel |
| | (1 pixel = R + G + B dots) | |
| Pixel pitch | 0.330(H) × 0.330(V) | mm |
| Pixel configuration | R.G.B vertical stripe | |
| Display mode | Normally white | |
| Unit outline dimensions *1 | 246.5(W) × 179.4(H) × 9.5(D) | mm |
| Mass | 500 ± 1% | g |
| Surface treatment | Anti-glare and hard-coating 2H Haze value = 25 ± 5% | |

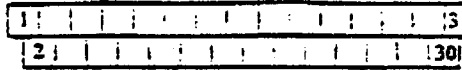
*1.Note: excluding backlight cables.

Outline dimensions is shown in Fig.1

4. Input Terminals

4-1. TFT-LCD panel driving

CN1 Used connector:DF9BA-31P-1V (Hirose Electric Co., Ltd.)



Corresponding connector: DF9-31S-1V (")

DF9A-31S-1V

DF9B-31S-1V

CN1 pin arrangement from module surface
(Transparent view)

| Pin No. | Symbol | Function | Remark |
|---------|--------|---|---------|
| 1 | GND | | |
| 2 | CK | Clock signal for sampling each data signal | |
| 3 | Hsync | Horizontal synchronous signal | [Note1] |
| 4 | Vsync | Vertical synchronous signal | [Note1] |
| 5 | GND | | |
| 6 | R0 | RED data signal(LSB) | |
| 7 | R1 | RED data signal | |
| 8 | R2 | RED data signal | |
| 9 | R3 | RED data signal | |
| 10 | R4 | RED data signal | |
| 11 | R5 | RED data signal(MSB) | |
| 12 | GND | | |
| 13 | G0 | GREEN data signal(LSB) | |
| 14 | G1 | GREEN data signal | |
| 15 | G2 | GREEN data signal | |
| 16 | G3 | GREEN data signal | |
| 17 | G4 | GREEN data signal | |
| 18 | G5 | GREEN data signal(MSB) | |
| 19 | GND | | |
| 20 | B0 | BLUE data signal(LSB) | |
| 21 | B1 | BLUE data signal | |
| 22 | B2 | BLUE data signal | |
| 23 | B3 | BLUE data signal | |
| 24 | B4 | BLUE data signal | |
| 25 | B5 | BLUE data signal(MSB) | |
| 26 | GND | | |
| 27 | ENAB | Signal to settle the horizontal display position | [Note2] |
| 28 | Vcc | +5.0V power supply | |
| 29 | Vcc | +5.0V power supply | |
| 30 | R/L | Signal to settle the horizontal display reverse | |
| 31 | TST | This should be electrically opened during operation | |

*The shielding case is connected with GND.

[Note1] 480 line, 400 line or 350 line mode
is selected by the polarity combination
of the both synchronous signals.

| Mode | 480 lines | 400 lines | 350 lines |
|-------|-----------|-----------|-----------|
| Hsync | negative | negative | positive |
| Vsync | negative | positive | negative |

[Note2] The horizontal display start timing is settled in accordance with a rising timing of ENAB signal. In case ENAB is fixed "Low", the horizontal start timing is determined as described in 7-2. Don't keep ENAB "High" during operation.

4-2. Backlight driving

Used connector : BHR-03VS-1(JST)

CN2

Corresponding connector : SM02(8.0)B-BHS(JST)

| Pin no. | symbol | function |
|---------|-------------------|--|
| 1 | V _{HIGH} | Power supply for lamp (High voltage side) |
| 2 | NC | This is electrically opened. |
| 3 | V _{LOW} | Power supply for lamp (Low voltage side) |

5. Absolute Maximum Ratings

| Parameter | Symbol | Condition | Ratings | Unit | Remark |
|---------------------------------|------------------|----------------------|-----------------------------|------|---------|
| Input voltage | V _I | T _a =25°C | -0.3 ~ V _{CC} +0.3 | V | [Note1] |
| +5V supply voltage | V _{CC} | T _a =25°C | 0 ~ +6 | V | |
| Storage temperature | T _{stg} | — | -25 ~ +60 | °C | [Note2] |
| Operating temperature (Ambient) | T _{opa} | — | 0 ~ +50 | °C | |

[Note1] CK_R0~R5,G0~G5,B0~B5,Hsync,Vsync,ENAB

[Note2] Humidity : 95%RH Max. at T_a ≤ 40°C.Maximum wet-bulb temperature at 39°C or less at T_a > 40°C.

No condensation.

6. Electrical Characteristics

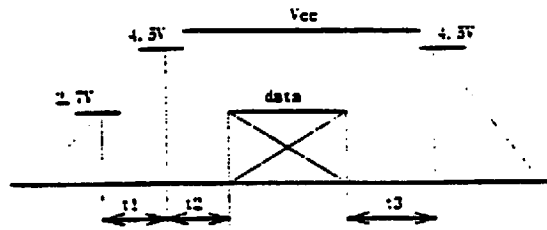
6-1. TFT-LCD panel driving

T_a = 25°C

| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Remark |
|----------------------------------|---------------------|------------------|--------------------|------|--------------------|-------|--|
| +5V | Supply voltage | V _{CC} | +4.5 | +5.0 | +5.5 | V | [Note1] |
| | Current dissipation | I _{CC} | — | 180 | 300 | mA | [Note2] |
| Permissible input ripple voltage | | V _{RP} | — | — | 100 | mVp-p | V _{CC} =+5V |
| Input voltage (Low) | | V _{IL} | — | — | 0.3V _{CC} | V | [Note3] |
| Input voltage (High) | | V _{IH} | 0.7V _{CC} | — | — | V | |
| Input current (low) | | I _{OL} | — | — | 1.0 | μA | V _I =0V [Note3] |
| Input current (High) | | I _{OH1} | — | — | 1.0 | μA | V _I =V _{CC} [Note4] |
| | | I _{OH2} | — | — | 60.0 | μA | V _I =V _{CC} [Note5] |

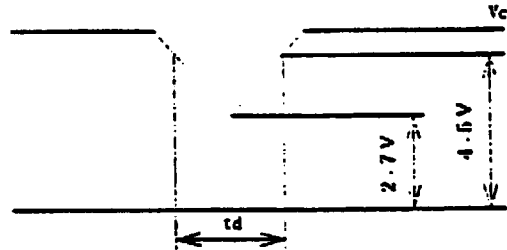
[Note1]
Vcc-turn-on conditions

- $t1 \leq 10ms$
- $0 < t2 \leq 10ms$
- $0 < t3 \leq 1s$



Vcc-dip conditions

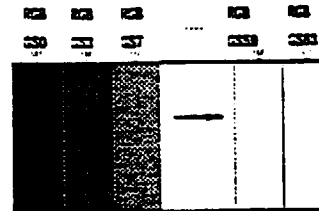
- 1) $2.7V \leq Vcc < 4.5V$
 $td \leq 10ms$
- 2) $Vcc < 2.7V$



Vcc-dip conditions should also follow the Vcc-turn-on conditions

[Note2] Typical current situation : 16-gray-bar pattern.

480 line mode
Vcc=+5.0V



[Note3] CK_R0~R5, G0~G5, B0~B5, Hsync, Vsync, ENAB

[Note4] CK_R0~R5, G0~G5, B0~B5, Hsync, Vsync

[Note5] ENAB

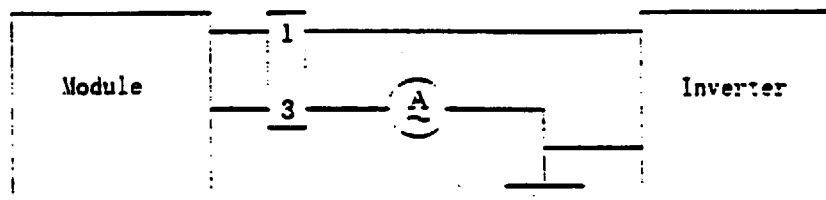
6-2. Backlight driving

The backlight system is an edge-lighting type with single CCFT (Cold Cathode Fluorescent Tube). The characteristics of single lamp are shown in the following table.

Ta=25°C

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Remark |
|------------------------|--------|-------|------|------|-------------------|----------------|
| Lamp current | I_L | 2.5 | 3.0 | 4.5 | mA _{rms} | [Note1] |
| Lamp power consumption | P_L | - | 1.6 | - | W | [Note2] |
| Lamp frequency | F_L | 20 | 35 | 60 | KHz | [Note3] |
| Kick-off voltage | V_s | - | - | 1100 | V _{rms} | Ta=25°C |
| | | - | - | 1300 | V _{rms} | Ta=0°C [Note4] |
| Lamp life time | L_L | 10000 | - | - | hour | [Note5] |

[Note1] Lamp current is measured with current meter for high frequency as shown below.



* 3pin is V_{LOW}

[Note2] At the condition of $Y_L = 70cd/m^2$

[Note3] Lamp frequency may produce interference with horizontal synchronous frequency, and this may cause beat on the display. Therefore lamp frequency shall be detached as much as possible from the horizontal synchronous frequency and from the harmonics of horizontal synchronous to avoid interference.

[Note4] The open output voltage of the inverter shall be maintained for more than 1sec; otherwise the lamp may not be turned on.

[Note5] Lamp life time is defined that it applied either ① or ② under this condition
(Continuous turning on at $T_a=25^{\circ}\text{C}$, $I_L=4.5\text{mA rms}$)

① Brightness becomes 50% of the original value under standard condition.

② Kick-off voltage at $T_a=0^{\circ}\text{C}$ exceeds maximum value, 1300 Vrms.

Note) The performance of the backlight, for example life time or brightness, is much influenced by the characteristics of the DC-AC inverter for the lamp. When you design or order the inverter, please make sure that a poor lighting caused by the mismatch of the backlight and the inverter (miss-lighting, flicker, etc.) never occur. when you confirm it, the module should be operated in the same condition as it is installed in your instrument.

7. Timing Characteristics of input signals

Timing diagrams of input signal are shown in Fig.2 - ①~③ .

7-1. Timing characteristics

| Parameter | Symbol | Mode | Min. | Typ. | Max. | Unit | Remark | |
|------------------------------|-------------|------|-------|-------|--------|---------------|--------|--|
| Clock | Frequency | 1/Tc | — | 25.18 | 32.00 | MHz | | |
| | High time | Tch | 5 | — | — | ns | | |
| | Low time | Tcl | 10 | — | — | ns | | |
| Data | Setup time | Tds | 5 | — | — | ns | | |
| | Hold time | Tdh | 10 | — | — | ns | | |
| Horizontal sync. signal | Cycle | TH | 30.00 | 31.78 | — | μs | | |
| | | " | 770 | 800 | 900 | clock | | |
| | Pulse width | THp | 2 | 96 | 200 | clock | | |
| Vertical sync. signal | Cycle | TV | 480 | 515 | 525 | 560 | line | |
| | | " | 400 | 445 | 449 | 480 | line | |
| | | " | 350 | 447 | 449 | 510 | line | |
| | Pulse width | TVp | all | 1 | — | 34 | line | |
| Horizontal display period | THd | " | 640 | 640 | 640 | clock | | |
| Hsync-Clock phase difference | THc | " | 10 | — | Tc-10 | ns | | |
| Hsync-Vsync phase difference | TVh | " | 0 | — | TH-THp | clock | | |

Note) In case of lower frequency, the deterioration of display quality, flicker etc., may be occurred.

7-2. Horizontal display position

The horizontal display position is determined by ENAB signal and the input data corresponding to the rising edge of ENAB signal is displayed at the left end of the active area.

| Parameter | | symbol | Min. | Typ. | Max. | Unit | Remark |
|--------------------------------------|-------------|--------|------|------|-------|-------|--------|
| Enable signal | Setup time | Tes | 5 | — | Tc-10 | ns | |
| | Pulse width | Tep | 2 | 640 | 640 | clock | |
| Hsync-Enable signal phase difference | | THE | 44 | — | 164 | clock | |

Note) When ENAB is fixed "Low", the display starts from the data of C104(clock) as shown in Fig.2-①~③. Be careful that the module does not work when ENAB is fixed "High".

7-3. Vertical display position

The vertical display position is automatically centered in the active area at each mode of VGA, 480-, 400-, and 350-line mode. Each mode is selected depending on the polarity of the synchronous signals described in 4-1(Note1).

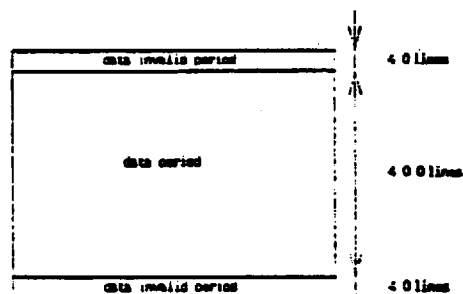
In each mode, the data of TVn is displayed at the top line of the active area. And the display position will be centered on the screen like the following figure when the period of vertical synchronous signal, TV, is typical value.

In 400-, and 350-line mode, the data in the vertical data invalid period is also displayed,

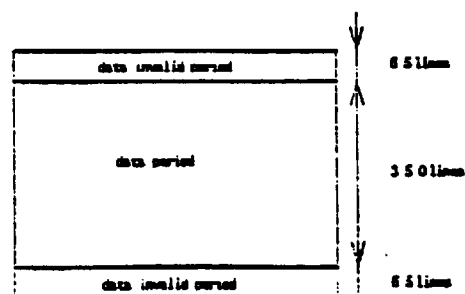
So, inputting all data "0" is recommended during vertical data invalid period.

ENAB signal has no relation to the vertical display position.

| mode | V-data start(TVs) | V-data period(TVd) | V-display start(TVn) | V-display period | Unit | Remark |
|------|-------------------|--------------------|----------------------|------------------|------|--------|
| 480 | 34 | 480 | 34 | 480 | line | |
| 400 | 34 | 400 | 443-TV | 480 | line | |
| 350 | 61 | 350 | 445-TV | 480 | line | |

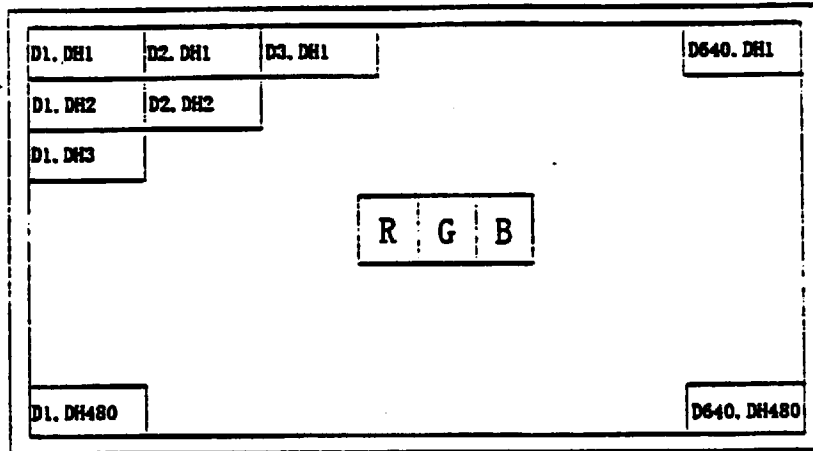


400 lines mode (TV=449)



350 lines mode (TV=449)

7-4. Input Data Signals and Display Position on the screen

Display position of input data (480 lines mode)
(H. V)

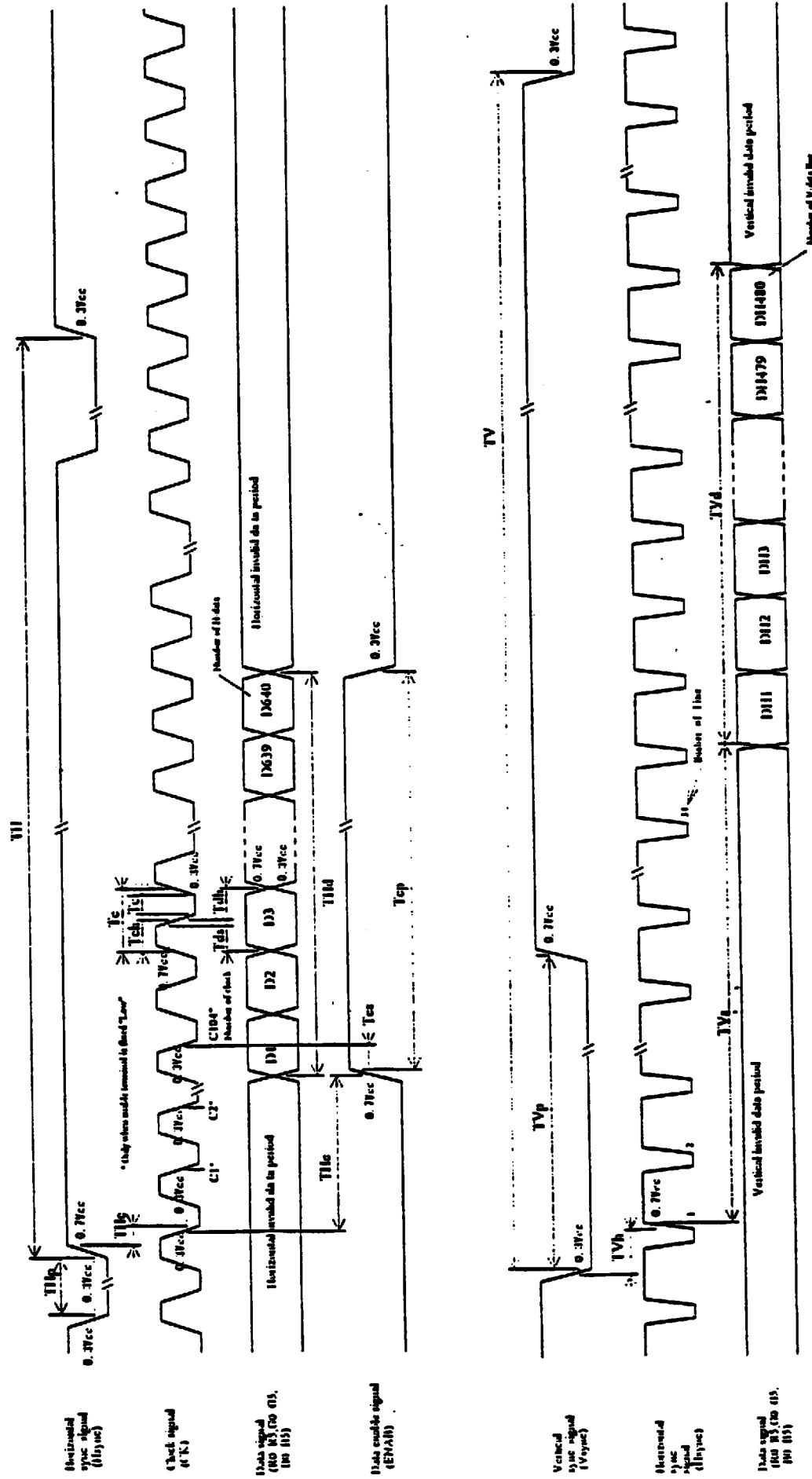


Fig 2-1 Input signal waveforms (480 line mode)

8. Input Signals, Basic Display Colors and Gray Scale of Each Color

| | Colors & Gray scale | Data signal | | | | | | | | | | | | | | | | | | |
|---------------------|------------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | GrayScale | R0 | R1 | R2 | R3 | R4 | R5 | G0 | G1 | G2 | G3 | G4 | G5 | B0 | B1 | B2 | B3 | B4 | B5 |
| Basic color | Black | — | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Blue | — | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Green | — | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Cyan | — | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Red | — | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Magenta | — | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Yellow | — | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | White | — | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Gray Scale of red | Black | GS0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ↑ | GS1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Darker | GS2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ↑ | ↓ | | | | ↓ | | | | | ↓ | | | | | | ↓ | | | |
| | ↓ | ↓ | | | | ↓ | | | | | ↓ | | | | | | ↓ | | | |
| | Brighter | GS61 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ↓ | GS62 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Red | GS63 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gray Scale of green | Black | GS0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ↑ | GS1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Darker | GS2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ↑ | ↓ | | | | ↓ | | | | | ↓ | | | | | | ↓ | | | |
| | ↓ | ↓ | | | | ↓ | | | | | ↓ | | | | | | ↓ | | | |
| | Brighter | GS61 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ↓ | GS62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Green | GS63 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Gray Scale of blue | Black | GS0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | ↑ | GS1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | Darker | GS2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | ↑ | ↓ | | | | ↓ | | | | | ↓ | | | | | | ↓ | | | |
| | ↓ | ↓ | | | | ↓ | | | | | ↓ | | | | | | ↓ | | | |
| | Brighter | GS61 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 |
| | ↓ | GS62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| | Blue | GS63 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |

0 : Low level voltage, 1 : High level voltage

Each basic color can be displayed in 64 gray scales from 6 bit data signals. According to the combination of total 18 bit data signals, the 262,144-color display can be achieved on the screen.

9. Optical Characteristics

Ta=25°C. Vcc=-5V

| Parameter | | Symbol | Condition | Min. | Typ. | Max. | Unit | Remark |
|-------------------------------|------------|------------------------|--------------------|-------|-------|-------|-------------------|-------------------|
| Viewing angle range | Horizontal | $\theta 21, \theta 22$ | CR>10 | 35 | — | — | Deg. | [Note1,4] |
| | Vertical | $\theta 11$ | | 10 | — | — | Deg. | |
| | | $\theta 12$ | | 30 | — | — | Deg. | |
| Contrast ratio | | CR | $\theta = 0^\circ$ | 100 | — | — | | [Note2,4] |
| Response time | Rise | τr | | — | 30 | — | ms | [Note3,4] |
| | Decay | τd | | — | 50 | — | ms | |
| Chromaticity of white | | x | | 0.263 | 0.313 | 0.363 | | [Note4] |
| | | y | | 0.279 | 0.329 | 0.379 | | |
| Luminance of white [Note4] | | Y_{L1} | | 50 | 70 | — | cd/m ² | $I_L=3.0mA_{rms}$ |
| | | Y_{L2} | | 60 | 80 | — | cd/m ² | $I_L=3.4mA_{rms}$ |
| | | Y_{L3} | | 80 | 100 | — | cd/m ² | $I_L=4.0mA_{rms}$ |
| White Uniformity | | δ_w | | — | — | 1.45 | | [Note5] |

*The measurement shall be executed 30 minutes after lighting at rating. (typical condition: $I_L=3.0mA_{rms}$)

The optical characteristics shall be measured in a dark room or equivalent state with the method shown in Fig.3 below.

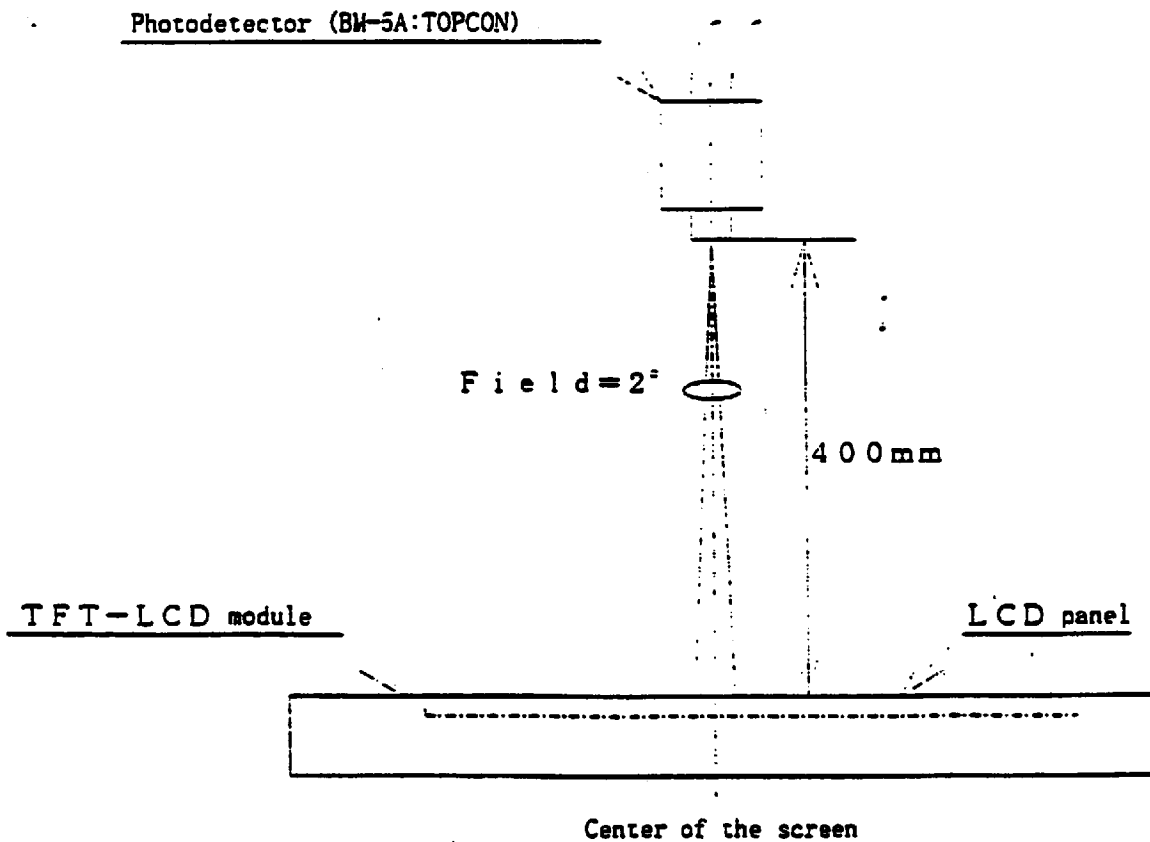
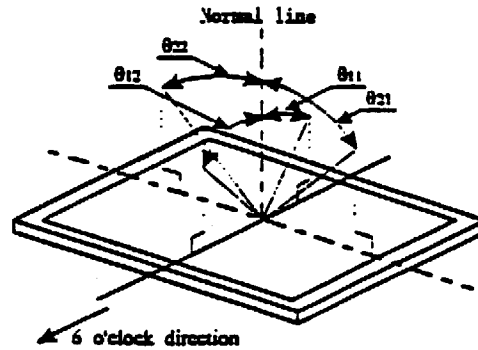


Fig.3 Optical characteristics measurement method

[Note1] Definitions of viewing angle range:



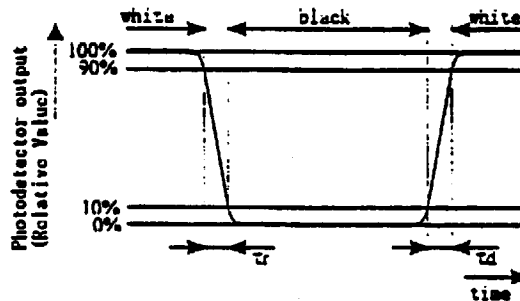
[Note2] Definition of contrast ratio:

The contrast ratio is defined as the following.

$$\text{Contrast Ratio (CR)} = \frac{\text{Luminance (brightness) with all pixels white}}{\text{Luminance (brightness) with all pixels black}}$$

[Note3] Definition of response time:

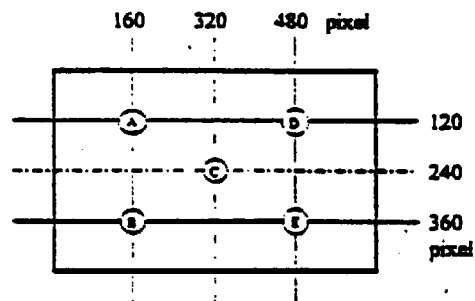
The response time is defined as the following figure and shall be measured by switching the input signal for "black" and "white".



[Note4] This shall be measured at center of the screen.

[Note5] Definition of white uniformity:

White uniformity is defined as the following with five measurements (A~E).



$$\delta_w = \frac{\text{Maximum Luminance of five points (brightness)}}{\text{Minimum Luminance of five points (brightness)}}$$

10. Display Quantity

The display quality of the color TFT-LCD module shall be in compliance with the Incoming Inspection Standard.

11. Handling Precautions

- a) Be sure to turn off the power supply when inserting or disconnecting the cable.
- b) Be sure to design the cabinet so that the module can be installed without any extra stress such as warp or twist.
- c) Since the front polarizer is easily damaged, pay attention not to scratch it.
- d) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- e) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
- f) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
Handle with care.
- g) Since CMOS LSI is used in this module, take care of static electricity and injure the human earth when handling.
- h) Observe all other precautionary requirements in handling components.
- i) This module has its circuitry PCBs on the rear side and should be carefully handled in order not to be stressed.
- j) Laminated film is attached to the module surface to prevent it from being scratched. Peel the film off slowly, just before the use, with strict attention to electrostatic charges. Ionized air shall be blown over during the action. Blow off 'dust' on the polarizer by using an ionized nitrogen gun, etc.

12. Packing form

- a) Piling number of cartons : MAX.7
- b) Package quantity in one carton : 10pcs
- c) Carton size : 298(W) × 295(H) × 362(D)mm
- d) Total mass of 1 carton filled with full modules : 6800g

Packing form is shown in Fig.4

13. Reliability test items

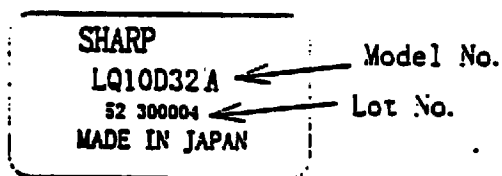
| No. | Test item | Conditions |
|-----|--|--|
| 1 | High temperature storage test | Ta=60°C 240h |
| 2 | Low temperature storage test | Ta=-25°C 240h |
| 3 | High temperature & high humidity operation test | Ta=40°C ; 95%RH 240h (No condensation) |
| 4 | High temperature operation test | Ta=50°C 240h |
| 5 | Low temperature operation test | Ta=0°C 240h |
| 6 | Vibration test (non- operating) | Frequency : 10~57Hz/Vibration width (one side):0.075mm : 58~500Hz/Gravity:9.8m/s ² Sweep time : 11 minutes Test period : 3 hours (1 hour for each direction of X,Y,Z) |
| 7 | Shock test (non- operating) | Max. gravity : 490m/s ² Pulse width : 11ms, half sine wave Direction : ±X, ±Y, ±Z once for each direction. |

【Result Evaluation Criteria】

Under the display quality test conditions with normal operation state, these shall be no change which may affect practical display function.

14. Others

1) Lot No. Label:



- 2) Adjusting volume have been set optimally before shipment, so do not change any adjusted value.
If adjusted value is changed, the specification may not be satisfied.
- 3) Disassembling the module can cause permanent damage and should be strictly avoided.
- 4) Please be careful since image retention may occur when a fixed pattern is displayed for a long time
- 5) If any problem occurs in relation to the description of this specification, it shall be resolved through discussion with spirit of cooperation.

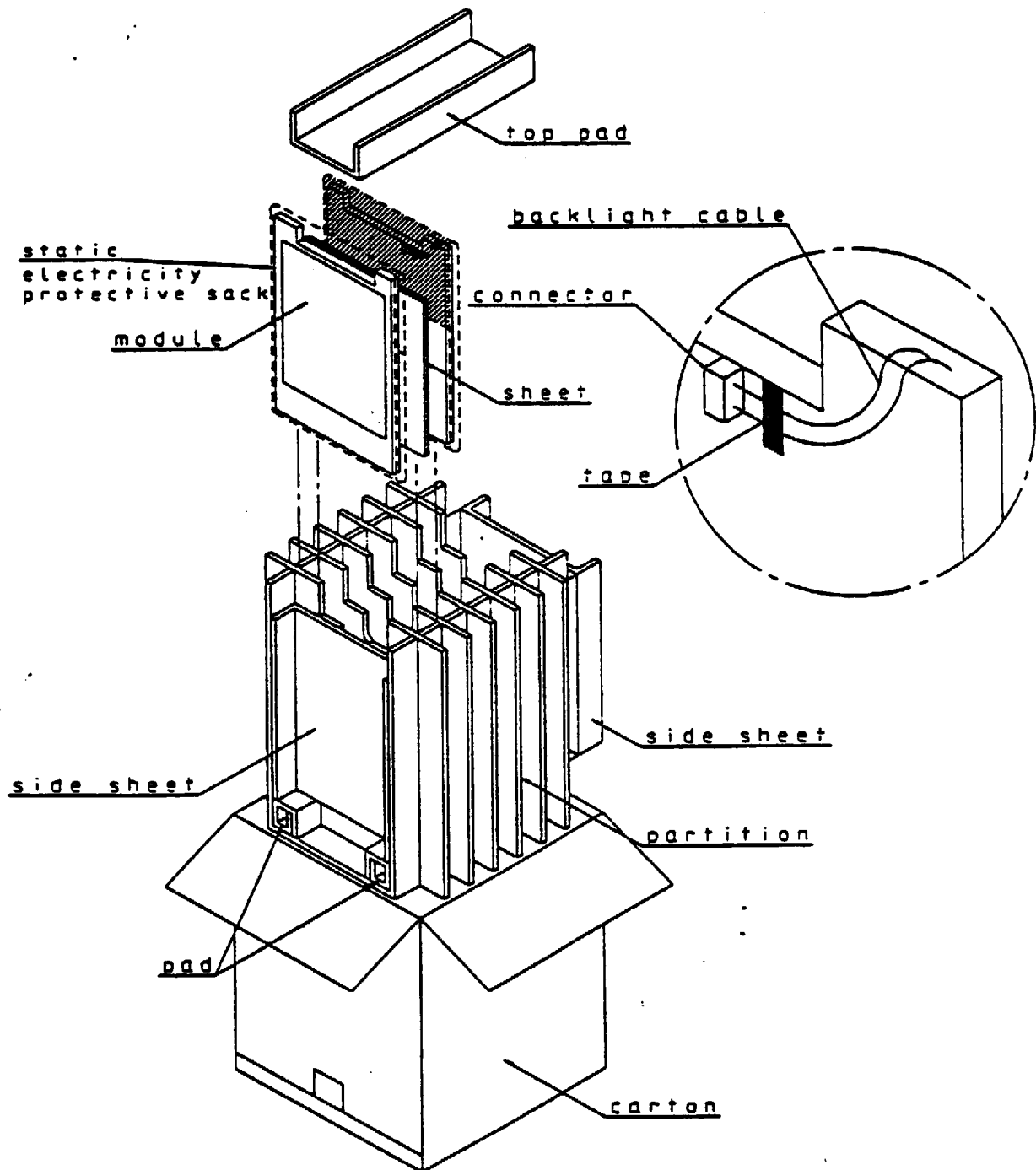


Fig. 4 Packing form

A

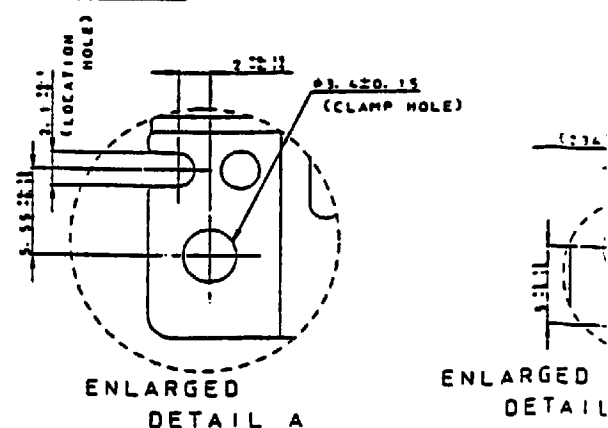
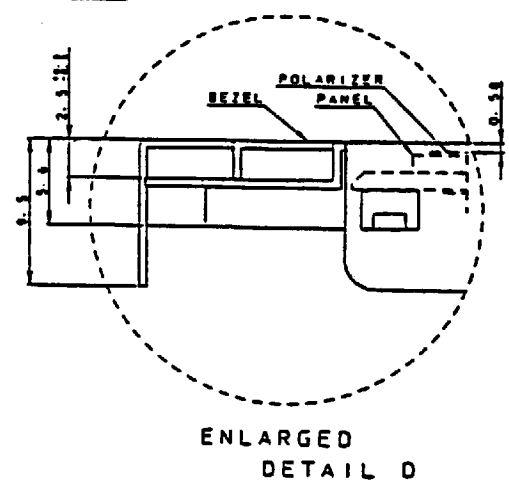
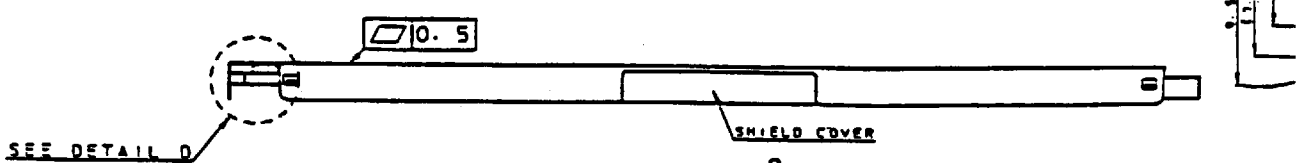
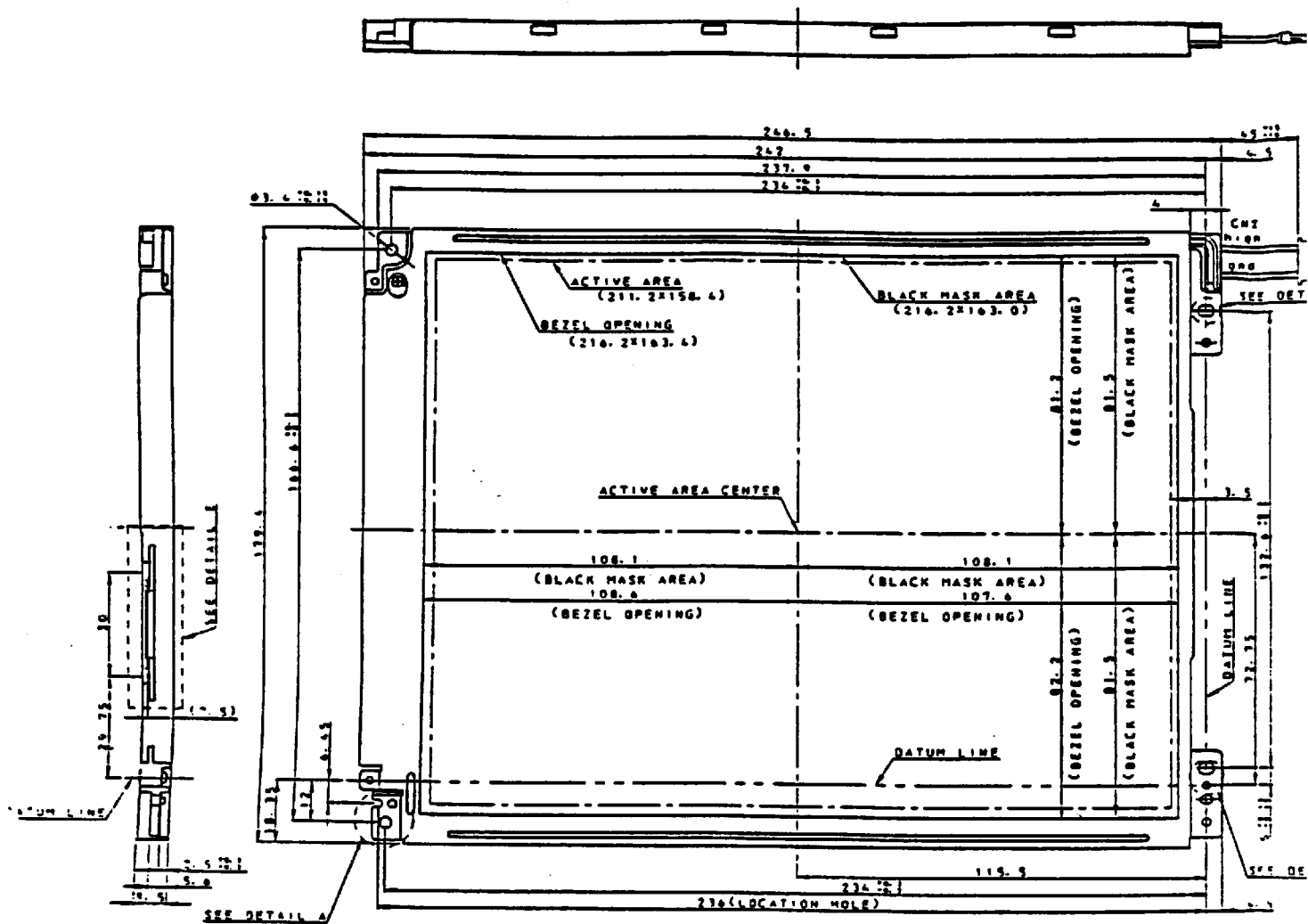
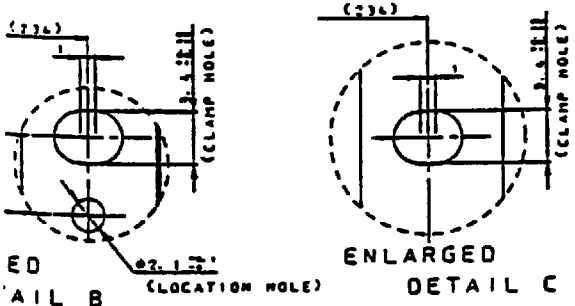
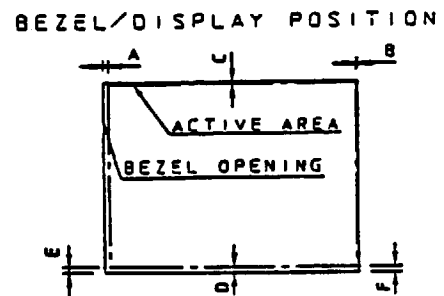
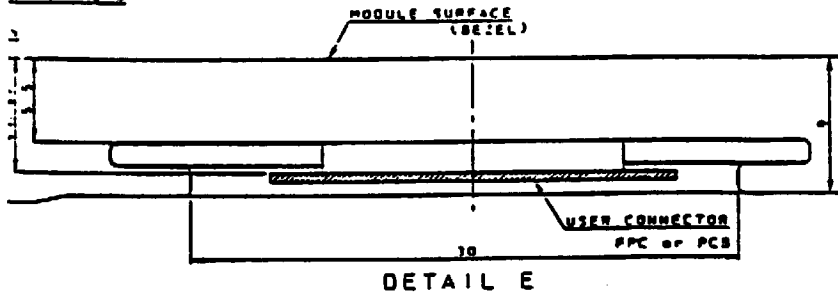
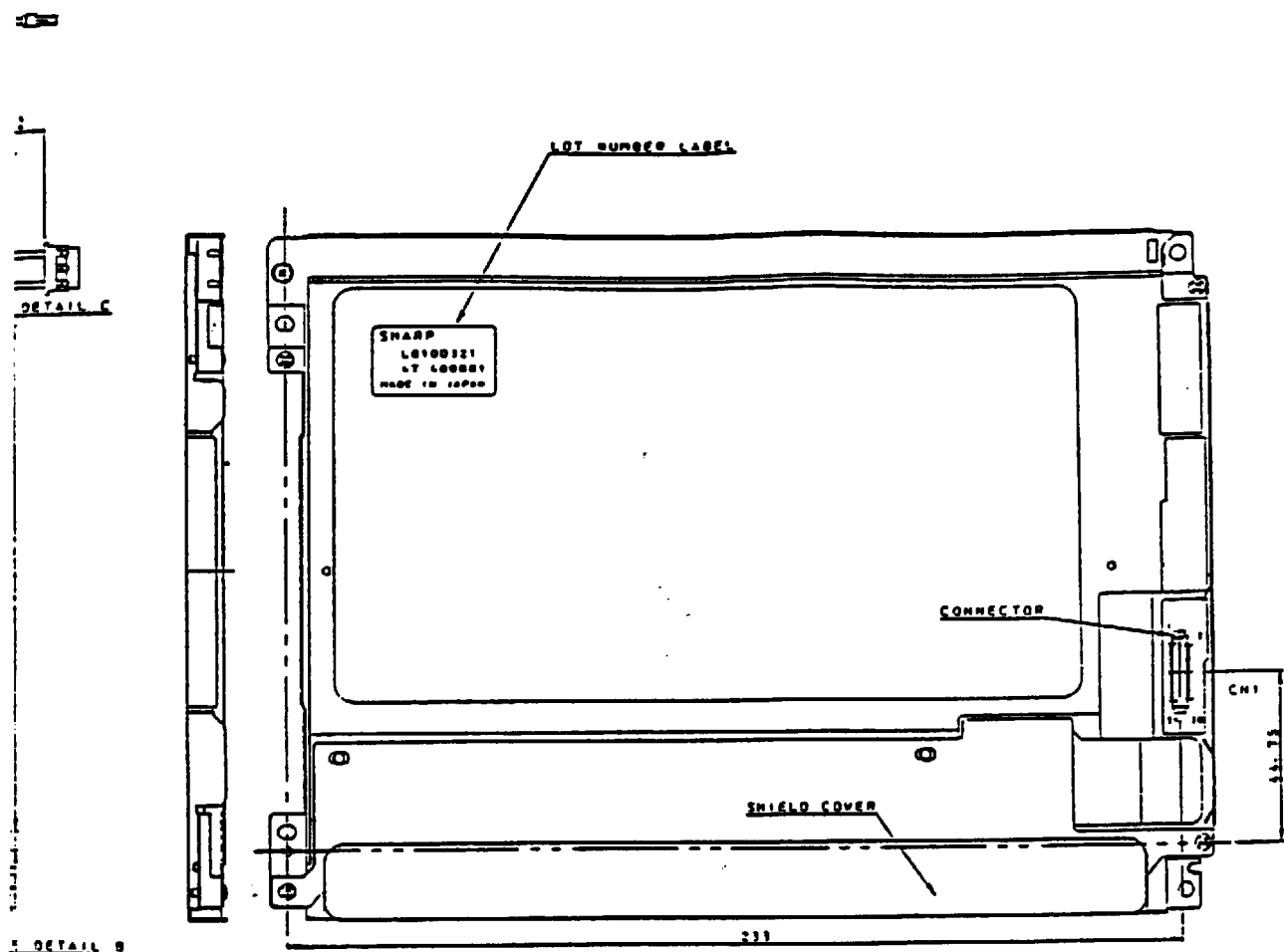


FIG 1

(B)

LD7109-17



- 1) TOLERANCE X-DIRECTION A: 3.0 ± 0.8
- 2) TOLERANCE X-DIRECTION B: 2.0 ± 0.8
- 3) TOLERANCE Y-DIRECTION C: 2.0 ± 0.8
- 4) TOLERANCE Y-DIRECTION D: 3.0 ± 0.8
- 5) OBLIQUITY OF DISPLAY AREA $|E-F| < 0.8$

NOTES

1. UNSPECIFIED TOLERANCE TO BE ± 0.5
2. WARP AND FLATING FOR PCB AND CHASSIS ARE EXCLUDED FROM THICKNESS AND DIMENSION OF THE UNIT.

OUTLINE DIMENSIONS