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TFT LIQUID CRYSTAL DISPLAY GROUP
SHARP CORPORATION

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APPLICABLE GROUP
TFT LIQUID CRYSTAL DISPLAY
GROUP

DEVICE SPECIFICATION FOR
TFT-LCD module
MODEL No. **LS024B7DW51**

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(1) Application

This literature applies to color TFT-LCD module, LS024B7DW51.

(2) Overview

This module is a color active matrix LCD module incorporating CG-Silicon TFT (Continuous Grain-Silicon Thin Film Transistor), named Mobile ASV LCD (Mobile Advanced Super View LCD). It is practicable in both transmissive-type and reflection-type modes. It is composed of a color TFT-LCD panel, driver ICs, power supply, an FPC, a back light, a touch panel and a back sealed casing. Graphics and texts can be displayed on a 240 × 3 × 240 dots panel with 65,536 colors by supplying.

It is a wide viewing-angle-mode (Vertical viewing angle:140 Horizontal viewing angle:140 ,CR 5).

(3) Mechanical specifications

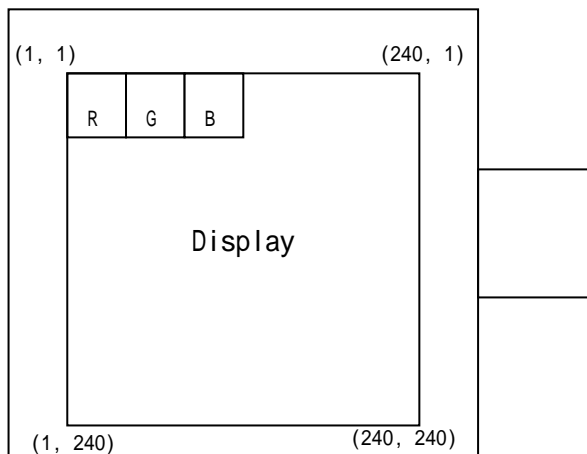
Table 1

Parameter	Specifications	Units	Remarks
Screen size (Diagonal)	6.16 [2.43 "] Diagonal	cm	
Display active area	43.56 (H) × 43.56 (V)	mm	
Pixel format	240(H) × 240(V) (1 pixel = R+G+B dots)	pixels	
Pixel pitch	0.0605 (H) × 0.1815 (V)	mm	
Pixel configuration	R,G,B vertical stripe		
Display mode	Normally black		
Unit outline dimension	54.5(W) × 57.8(H) × 4.4(D)	mm	【Note3-1】
Mass	27	g	
Surface hardness	3H		

【Note 3-1】

Excluding protrusion. For detailed measurements and tolerances, please refer to Fig. 1.

(4) Pixel configuration



(5)Input/Output terminal

5-1)TFT-LCD panel driving section

Table 2

Pin No.	Symbol	I/O	Description	Remarks
1	YB	-	Touch panel Y (6 o'clock side)	
2	XL	-	Touch panel X (left side)	
3	YT	-	Touch panel Y (12 o'clock side)	
4	XR	-	Touch panel X (Right side)	
5	NC	-		
6	PCI	-	Power Control In (active low)	
7	VSS	-	Ground	
8	PCLK	I	Data sampling clock signal	
9	VSS	-	Ground	
10	HSYNC	I	Horizontal sync signal	
11	VSYNC	I	Vertical sync signal	
12	VSS	-	Ground	
13	R5	I	RED data signal (MSB)	
14	R4	I	RED data signal	
15	R3	I	RED data signal	
16	R2	I	RED data signal	
17	R1/ID1	I	RED data signal (LSB) / ID Bit 1	
18	VSS	-	Ground	
19	G5	I	GREEN data signal (MSB)	
20	G4	I	GREEN data signal	
21	G3	I	GREEN data signal	
22	G2	I	GREEN data signal	
23	G1	I	GREEN data signal	
24	G0	I	GREEN data signal (LSB)	
25	VSS	-	Ground	
26	B5	I	BLUE data signal (MSB)	
27	B4	I	BLUE data signal	
28	B3	I	BLUE data signal	
29	B2	I	BLUE data signal	
30	B1/ID2	I	BLUE data signal (LSB) / ID Bit 2	
31	LCD_ON	I	Switches LCD on (active high)	
32	LED_ANODE	-	Power supply for LED (High voltage)	
33	LED_CATHODE	-	Power supply for LED (Low voltage)	
34	VSS	-	Ground	
35	VDD	-	Power supply of digital	
36	NC	-		
37	NC	-		
38	Enable	-	Data Enable (OE)	
39	VSS	-	Ground	

(6) Absolute Maximum Ratings

Table 3

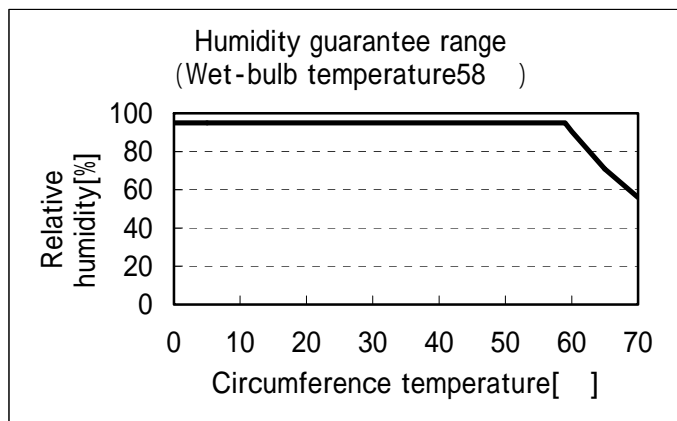
V_{SS}=0V

Parameter	Symbol	Condition	Ratings	Unit	Remark
Power supply(source/Digital)	V _{DD}	Ta=25	-0.3 ~ +4.0	V	
Input voltage (Digital)	LCD_ON	Ta=25	-0.3 ~ VDD+0.3	V	
Input voltage (Digital)	V _{ID}	Ta=25	-0.3 ~ +0.3	V	[Terminal] LCD_ON="Low"
			-0.3 ~ VDD+0.3	V	[Terminal] LCD_ON="High"
LED voltage	V _L	Ta=25	16.8	V	
Operating temperature (panel surface)	T _{opp}	-	-10 ~ 55		【Note6-1】
Storage temperature	T _{stg}	-	-20 ~ 70		【Note6-1】
LED current	I _L	Ta=25	25	mA	【Note6-2】
Touch panel input voltage	V _{tp}	Ta=25	7.0	V	[Terminal]

[Terminal] PCLK, PCI, HSYNC, VSYNC, Enable, R1 ~ R5, G0 ~ G5, B1 ~ B5

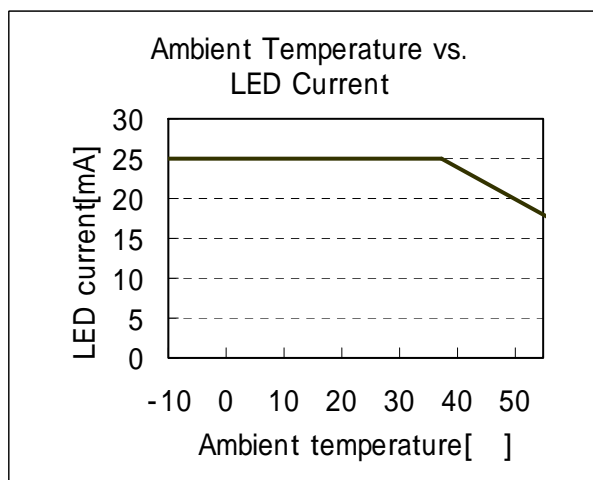
[Terminal] YT, XR, YB, XL

【Note6-1】 Humidity: 95%RH Max.(at Ta 58). Maximum wet-bulb temperature is less than 58 (at Ta > 58). Condensation of dew must be avoided.



The maximum humidity in the temperature

【Note 6-2】 LED current should be as per below figure.



(7) Electrical characteristics

7-1) Recommended operating conditions

A) TFT-LCD panel driving section

Table 4 $T_a=25$, $V_{DD}=3.0V$, $V_{SS}=0V$ unless otherwise stated

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Power supply(source/Digital)	V_{DD}	+2.85	+3.0	+3.6	V	
Supply current	I_{DD}	-	6.0	8.0	mA	【Note 7-1, 2】
Supply current	I_{DOFF}	-	-	10	μA	
Input voltage (Digital)	High voltage	V_{IH}	$0.8V_{DD}$	-	V_{DD}	【Note 7-3】
	Low voltage	V_{IL}	0	-	$0.2V_{DD}$	

【Note 7-1】 $V_{SYNC}=55Hz$, $H_{SYNC}=20.13kHz$, $DCLK=5.07MHz$

【Note 7-2】 64-Gray-bar vertical pattern (GS0 ~ GS63 for horizontal way)

【Note 7-3】 PCLK, HSYNC, VSYNC, LCD_ON, R1 ~ R5, G0 ~ G5, B1 ~ B5 and PCI terminals are applied.

B) Back light driving section

Table 5 $T_a=25$

Parameter	Symbol	MIN	TYP	MAX	Units	Remarks terminal
LED voltage	V_L	-	15.0	16.8	V	
LED current	I_L	-	20	-	mA	
Power consumption	W_L	-	0.300	-	W	【Note 7-4】

【Note 7-4】 Calculated reference value($I_L \times V_L$)

7-2) Recommended Power Sequence

Table 6

Symbol	Min.	Typ.	Max.	Unit	Remarks
TS1	1	-	3	Frame	
TS2	1	-	3	Frame	
TS3	2	-	4	Frame	
TS4	1	-	3	Frame	
TS5	100	-	-	ms	

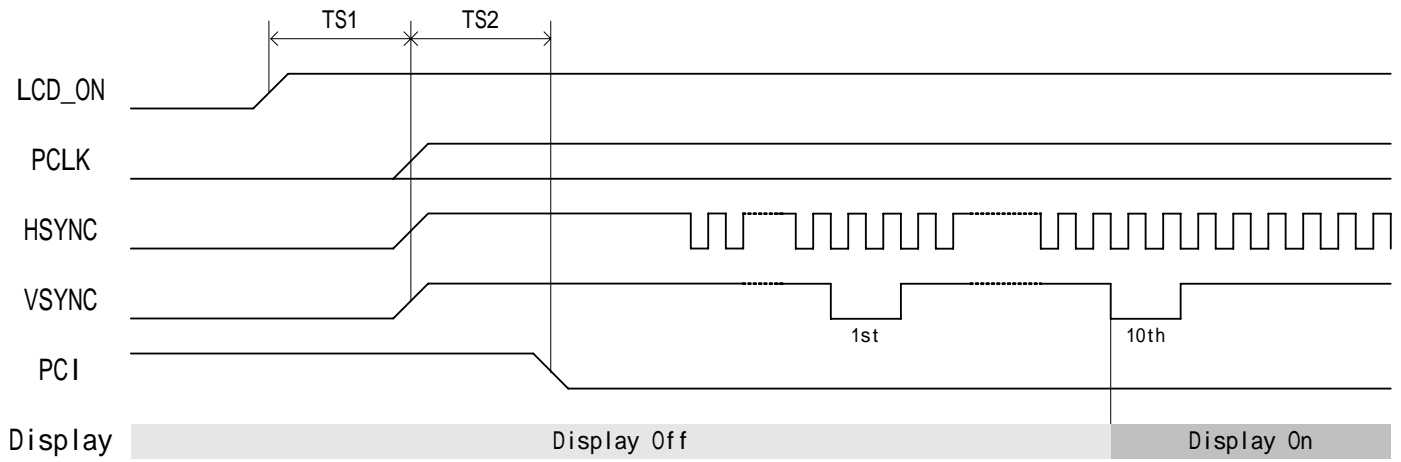


Fig.(a) Power-up sequence

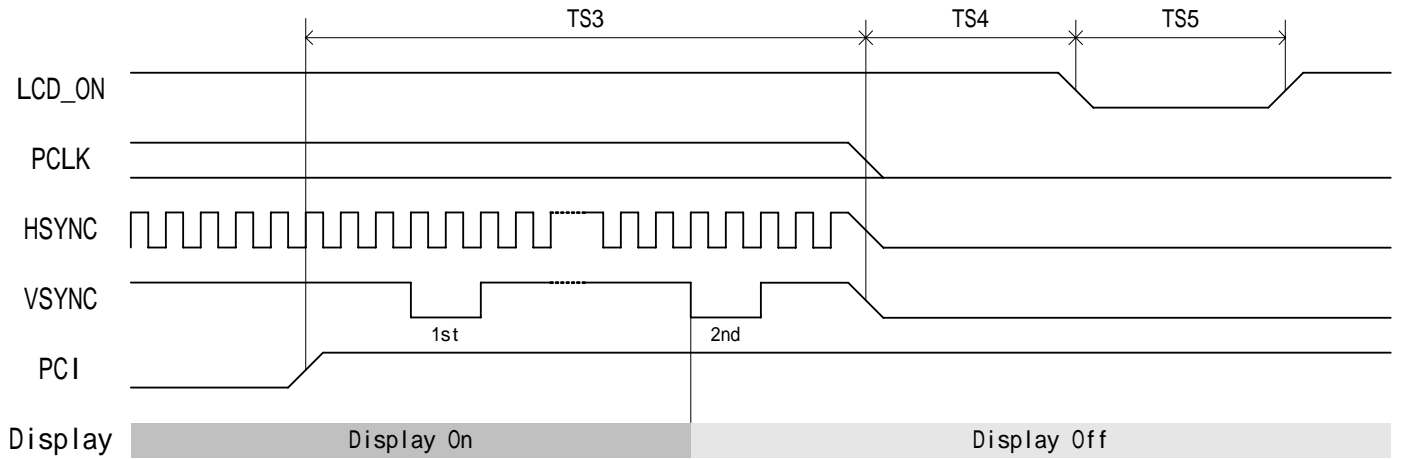


Fig.(b) Power-down sequence

7-3) Timing Characteristics of input signals

Table 7 AC Characteristics (1)

(VDD=+3.0V, Ta=25)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Period of pixel clock	Tclk	167	197	217	ns	PCLK
Period of HSYNC	Ths	-	252	-	clk	HSYNC
Period of VSYNC	Tvs	-	366	-	line	VSYNC
Set up time of data	Tds	20	-	-	ns	R1 ~ R5, G0 ~ G5 , B1 ~ B5
Hold time of data	Tdh	20	-	-	ns	
Set up time of HSYNC	Thss	20	-	-	ns	HSYNC
Hold time of HSYNC	Thsh	20	-	-	ns	
Set up time of VSYNC	Tvss	20	-	-	ns	VSYNC
Hold time of VSYNC	Tvsh	20	-	-	ns	
Pulse width of pixel clock	Tcw	0.4	0.5	0.6	clk	PCLK
Pulse width of HSYNC	Thsw	-	4	-	clk	HSYNC
Pulse width of VSYNC	Tvsw	-	2	-	line	VSYNC
Horizontal back porch	HBP	-	7.5	-	clk	HSYNC
Horizontal front porch	HFP	-	4.5	-	clk	
Vertical back porch	VBP	-	5	-	line	VSYNC
Vertical front porch	VFP	-	121	-	line	
HSYNC rising edge to VSYNC falling edge	Thv	0	-	248	clk	HSYNC, VSYNC

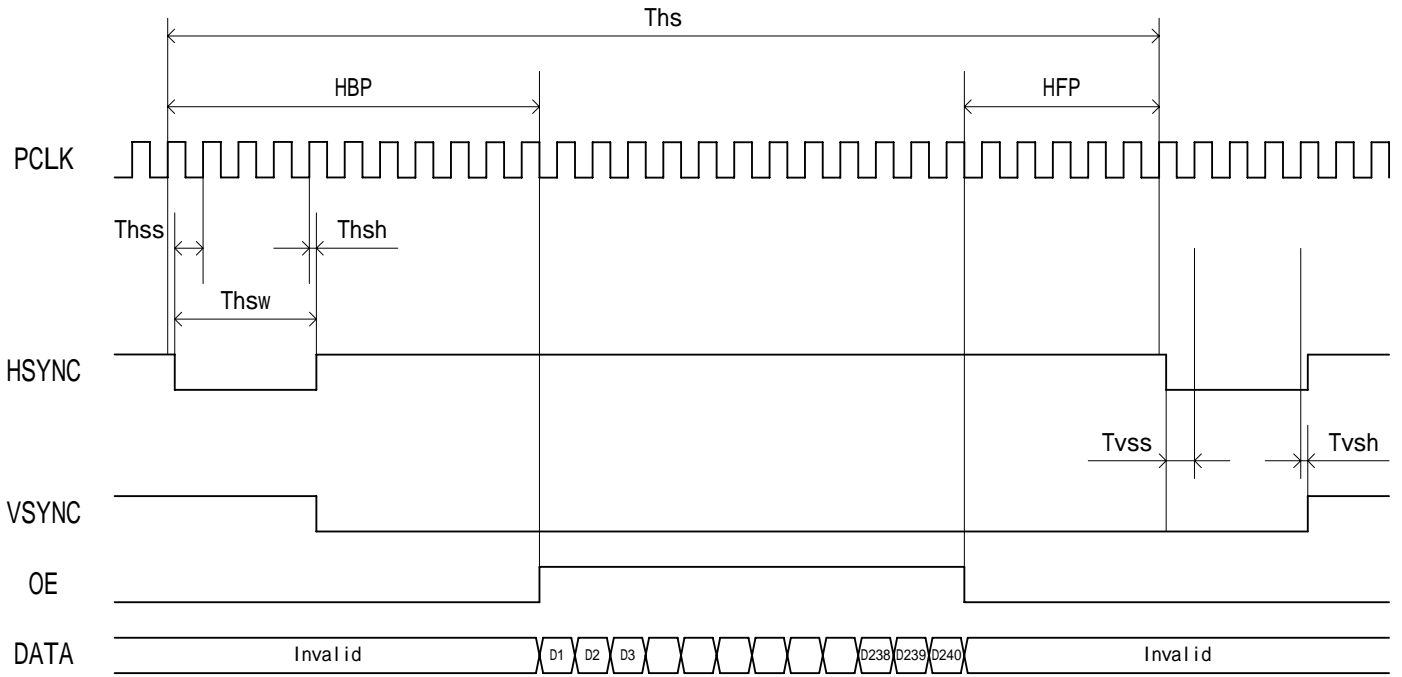


Fig.(c) Horizontal timing chart

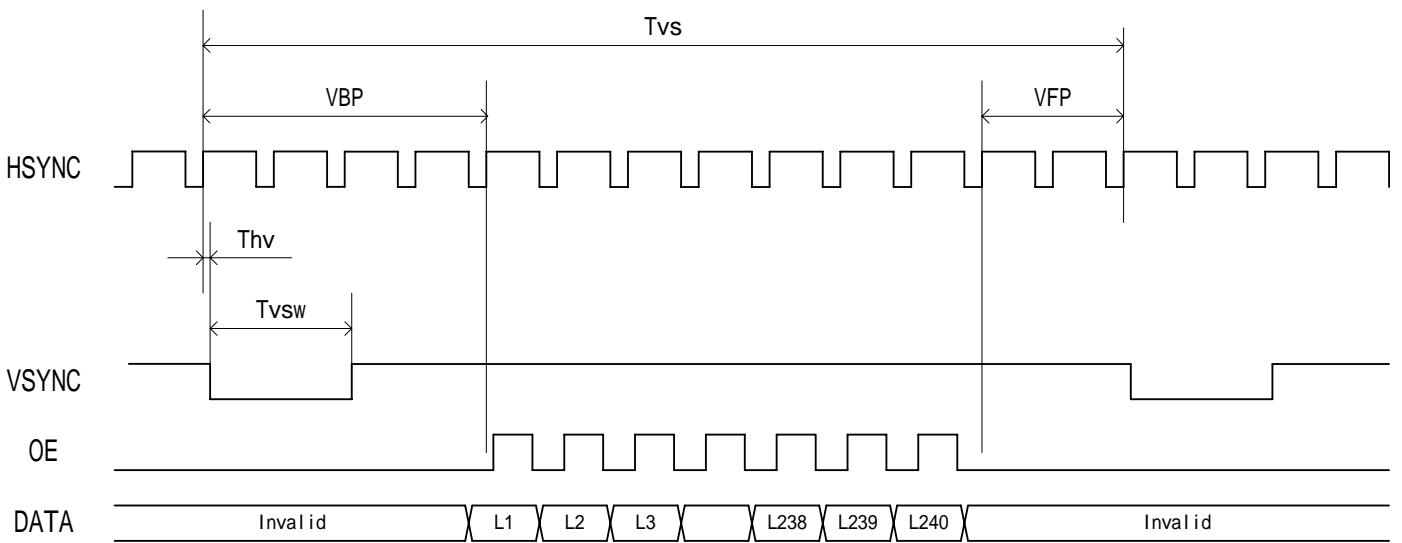


Fig.(d) Vertical timing chart

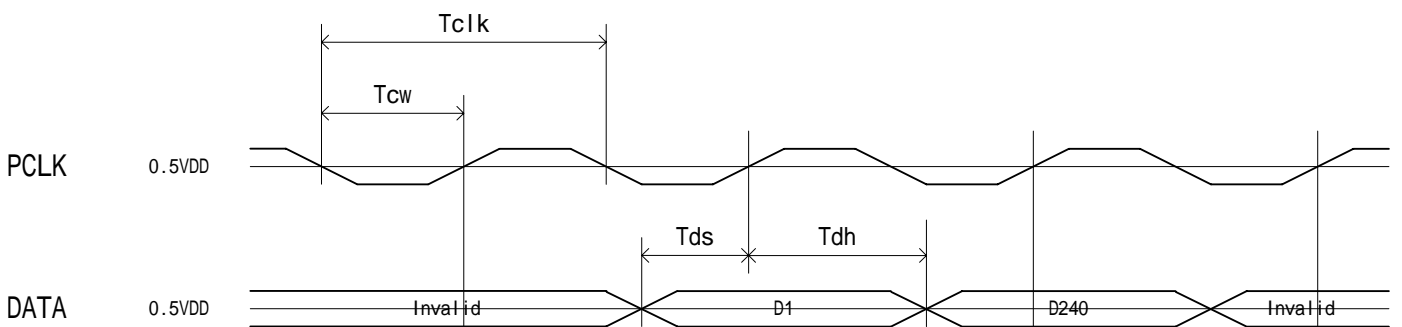


Fig.(e) Pixel clock timing chart

(8) Input Signals, Basic Display Color and Gray Scale of Each Color

Table 8

	Colors &		Data signal																
	Gray scale	Gray Scale	R1	R2	R3	R4	R5	G0	G1	G2	G3	G4	G5		B1	B2	B3	B4	B5
Basic color	Black	-	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		1	1	1	1	1
	Green	-	0	0	0	0	0	1	1	1	1	1	1		0	0	0	0	0
	Cyan	-	0	0	0	0	0	1	1	1	1	1	1		1	1	1	1	1
	Red	-	1	1	1	1	1	0	0	0	0	0	0		0	0	0	0	0
	Magenta	-	1	1	1	1	1	0	0	0	0	0	0		1	1	1	1	1
	Yellow	-	1	1	1	1	1	1	1	1	1	1	1		0	0	0	0	0
	White	-	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
	↑	GS2	1	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
	Darker	GS4	0	1	0	0	0	0	0	0	0	0	0		0	0	0	0	0
	↑	↓	↓					↓					↓						
	↓	↓	↓					↓					↓						
	Brighter	GS59	1	0	1	1	1	0	0	0	0	0	0		0	0	0	0	0
	↓	GS61	0	1	1	1	1	0	0	0	0	0	0		0	0	0	0	0
	Red	GS63	1	1	1	1	1	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
	↑	GS1	0	0	0	0	0	1	0	0	0	0	0		0	0	0	0	0
	Darker	GS2	0	0	0	0	0	0	1	0	0	0	0		0	0	0	0	0
	↑	↓	↓					↓					↓						
	↓	↓	↓					↓					↓						
	Brighter	GS61	0	0	0	0	0	1	0	1	1	1	1		0	0	0	0	0
	↓	GS62	0	0	0	0	0	0	1	1	1	1	1		0	0	0	0	0
	Green	GS63	0	0	0	0	0	1	1	1	1	1	1		0	0	0	0	0
Gray Scale of bleu	Black	GS0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0
	↑	GS2	0	0	0	0	0	0	0	0	0	0	0		1	0	0	0	0
	Darker	GS4	0	0	0	0	0	0	0	0	0	0	0		0	1	0	0	0
	↑	↓	↓					↓					↓						
	↓	↓	↓					↓					↓						
	Brighter	GS59	0	0	0	0	0	0	0	0	0	0	0		1	0	1	1	1
	↓	GS61	0	0	0	0	0	0	0	0	0	0	0		0	1	1	1	1
	Bleu	GS63	0	0	0	0	0	0	0	0	0	0	0		1	1	1	1	1

0 : Low level voltage 1 : High level voltage

According to the combination of total 16 bit data signals, the 65,536-color display can be achieved on the screen.

(9) Optical characteristics

9-1) Reflective mode

Table 9

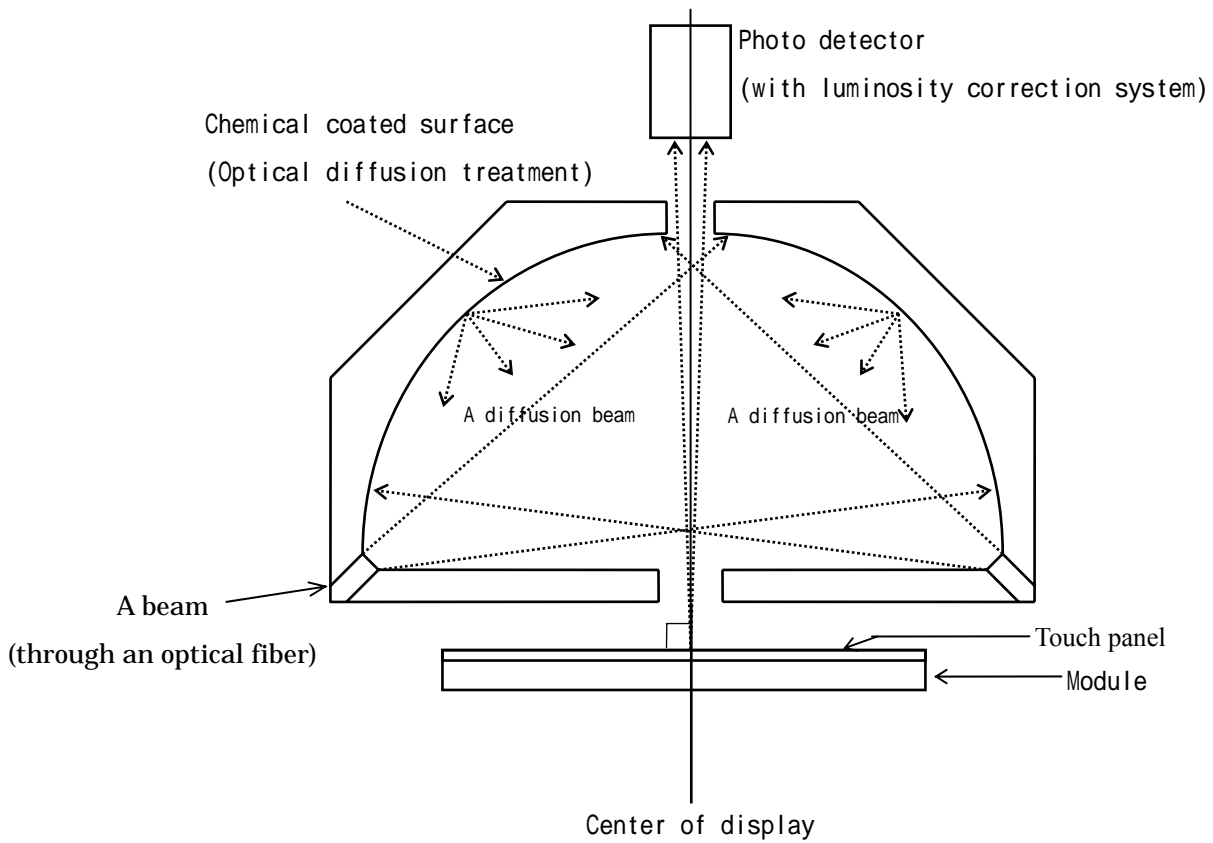
Ta=25

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remarks
Viewing angle range	$\theta_{11}+\theta_{12}$	CR 2	60	80	-	degree	【Note 9-1,2】
	$\theta_{21}+\theta_{22}$		60	80			
Contrast ratio	CR	= 0 °	6	9	-		【Note 9-2,3】
Response Time	Rise+Fall r+ d		-	35	50	ms	【Note 9-4】
White chromaticity	x		0.28	0.31	0.34		【Note 9-5】
	y		0.32	0.35	0.38		
Reflection ratio	R		3.9	5.6	-	%	【Note 9-6】

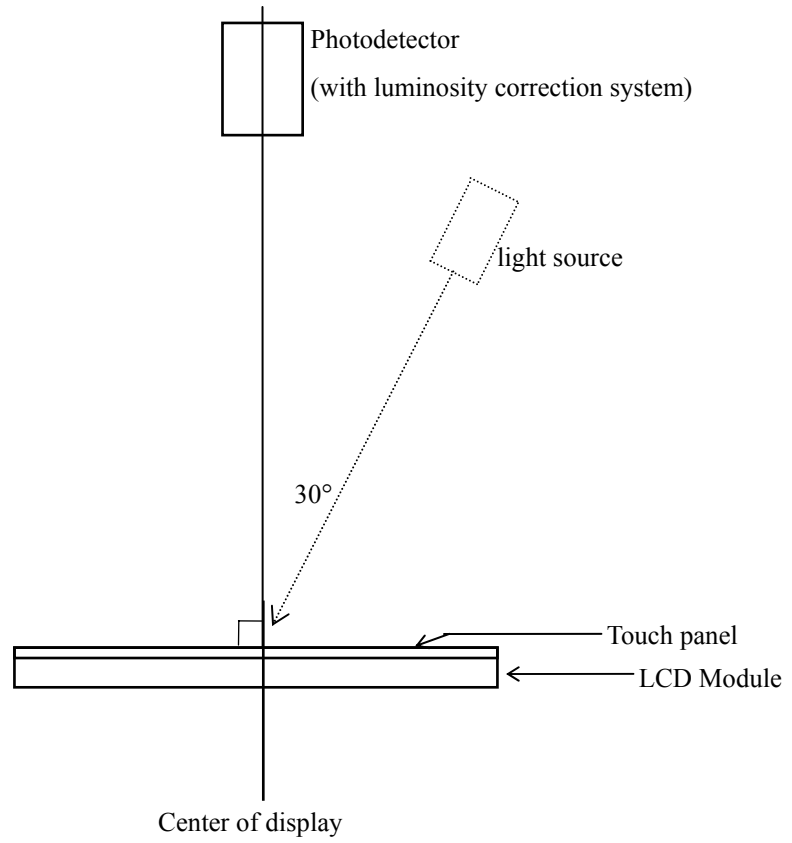
The measuring method of the optical characteristics is shown by the following figure.

A measurement device is Otsuka luminance meter LCD5200. (With the diffusion reflection unit.)

Normal line



Measuring method (a) for optical characteristics



Measuring method (b) for optical characteristics

9-2) Transmissive mode

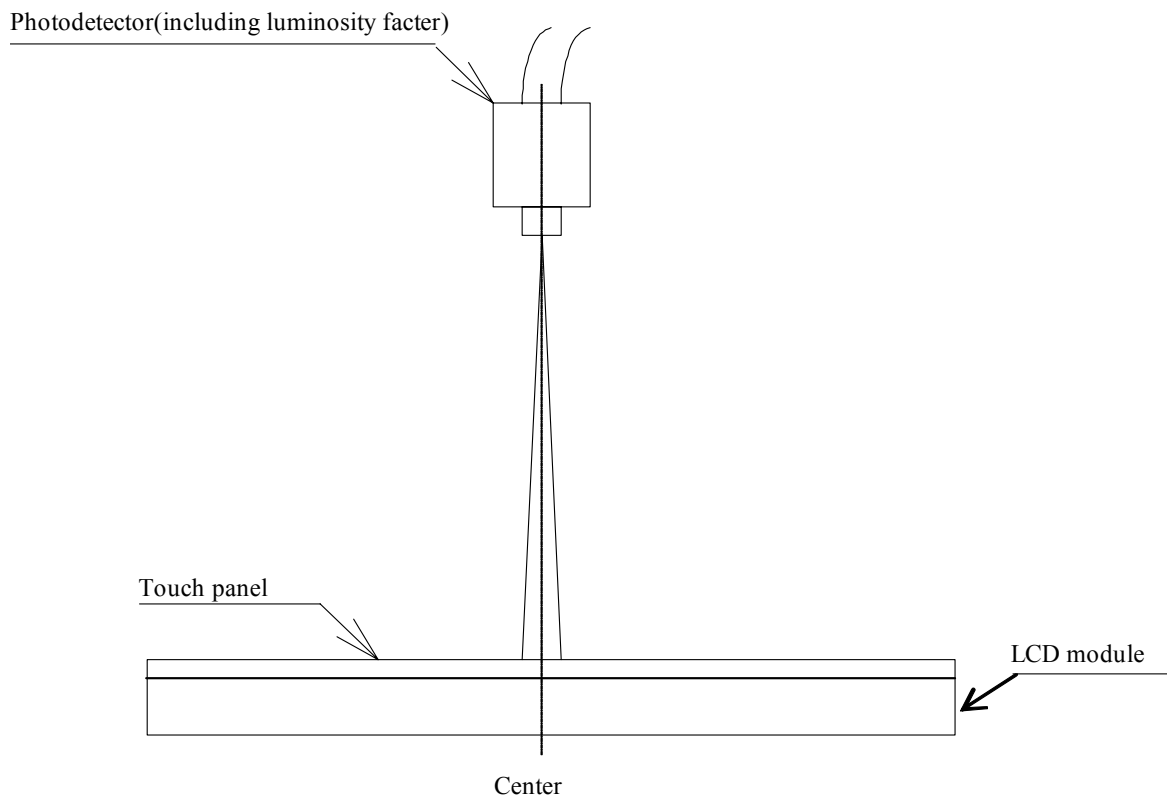
Table 10

Ta=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remarks		
Viewing angle range	$\theta_{11+\theta_{12}}$ $, \theta_{21+\theta_{22}}$	CR \geq 5	80	140	-	degree	[Note 9-1,2,7]		
Contrast ratio	CR	$\theta = 0^\circ$	210	300	-		[Note 9-2]		
Response	Rise+Fall		$\tau r+\tau d$	-	35	50	ms	[Note 9-4]	
White chromaticity	x		0.285	0.320	0.355		[Note 9-9]		
	y		0.305	0.340	0.375				
Red chromaticity	x		0.505	0.535	0.565				
	y		0.310	0.340	0.370				
Green chromaticity	x		0.295	0.335	0.375				
	y		0.460	0.500	0.540				
Blue chromaticity	x		0.120	0.150	0.180				
	y		0.140	0.170	0.200				
Brightness	Y		110	145	-			cd/m ²	I _L =20mA
Uniformity	U		70	-	-			%	[Note 9-8]
NTSC ratio	S	-	30	-	%				

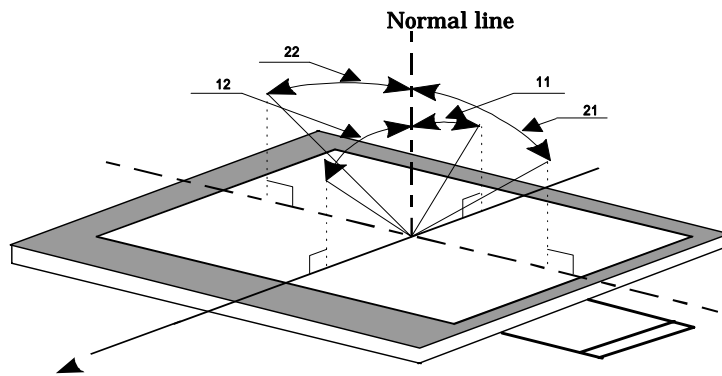
* The measuring method of the optical characteristics is shown by the following figure.

* A measurement device is TOPCON luminance meter SR-3. (Viewing cone 1)



Measuring method (b) for optical characteristics

【Note 9-1】 Viewing angle range is defined as follows.



6 o'clock direction

Definition for viewing angle

【Note 9-2】 Definition of contrast ratio:

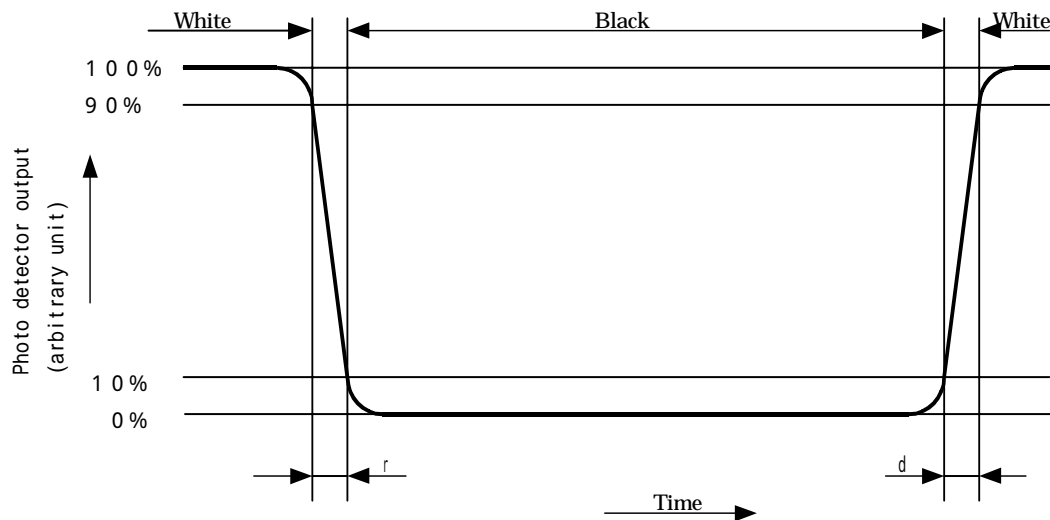
The contrast ratio is defined as follows:

$$\text{Contrast ratio(CR)} = \frac{\text{Photo detector output with all pixels white(GS63)}}{\text{Photo detector output with all pixels black(GS0)}}$$

【Note 9-3】 These values are under the condition of measuring method (b) with a point light source (lighting angle=30°).

【Note 9-4】 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".



【Note 9-5】 A measurement device is Minolta CM-2002.

【Note 9-6】 Definition of reflection ratio

$$\text{Reflection ratio} = \frac{\text{Light detected level of the reflection by the LCD module}}{\text{Light detected level of the reflection by the standard white board}}$$

【Note 9-7】 A measurement device is ELDIM EZContrast.

【Note 9-8】 Definition of Uniformity

$$\text{Uniformity} = \frac{\text{Minimum brightness}}{\text{Maximum brightness}}$$

The brightness should be measured on 9spots of the display as show in Fig.3

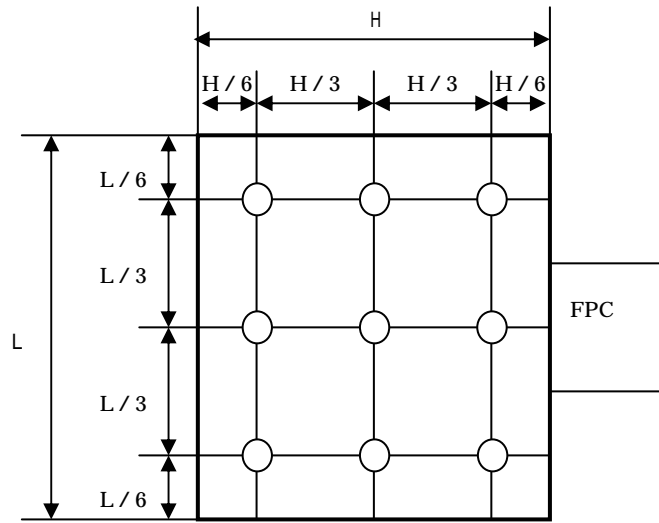
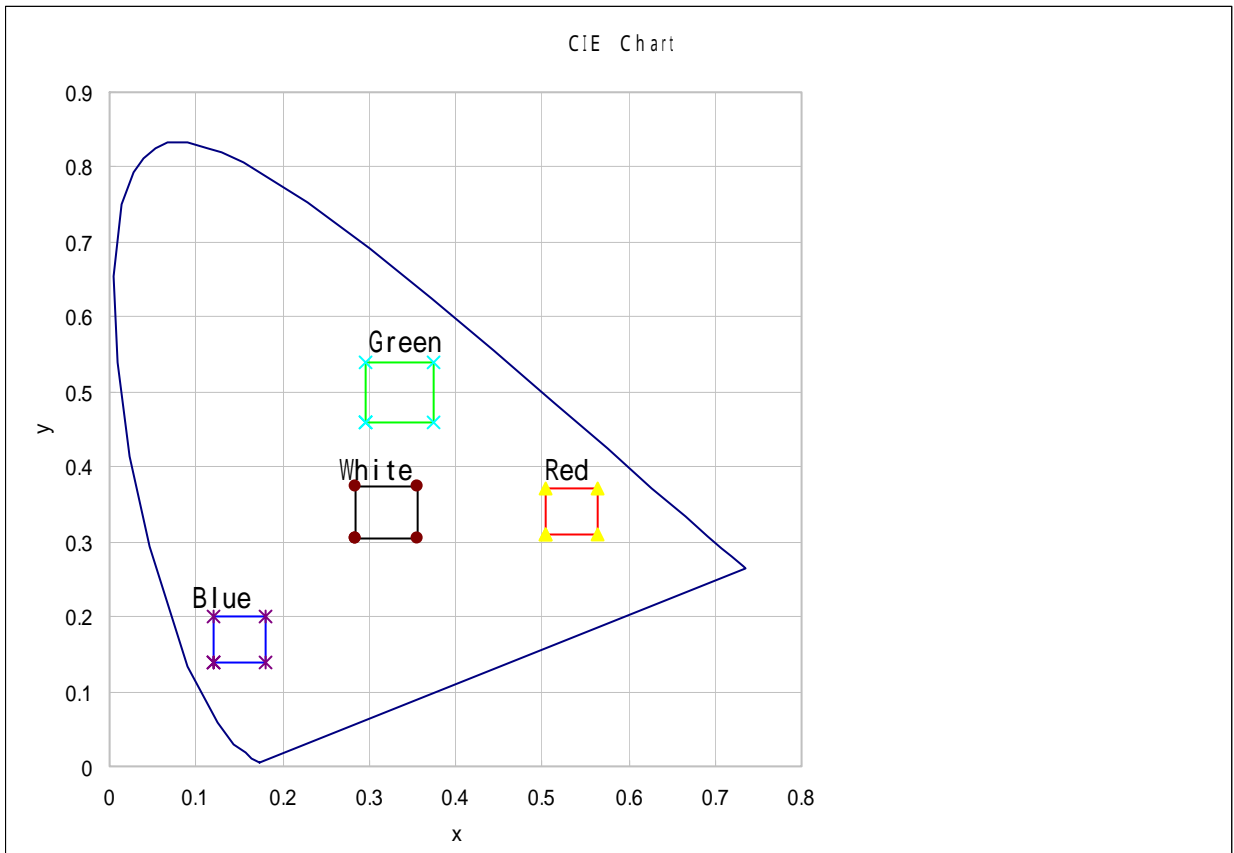


Fig.3

【Note 9-9】



Touch panel characteristics

Table 11

Parameter	Min.	Typ.	Max.	Unit	Remark
Input voltage	-	-	7.0	V	
Resistor between terminals(XL-XR)	100	-	1400		Provisional specification
Resistor between terminals(YT-YB)	100	-	1100		
Line linearity(X direction)	-	-	1.5	%	
Line linearity(Y direction)	-	-	1.5	%	
Insuration resistance	20	-	-	M	at DC25V
Minimum tension for detecting	-	-	0.79	N	

(10) Display quality

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

(12) Mechanical characteristics

12-1) External appearance

See Fig. 1

12-2) FPC characteristics

Specific connector

FH23-39S-0.3SHW(05) (HIROSE)

Bending endurance of the bending slits portion(See Fig.1) :

No line of the FPC is broken for the bending test (Bending radius=0.6mm and angle=90°) in 30 cycles.

12-3) Design guidance for touchpanel(T/P)

12-3-1)Example of housing design

(1)If an consumer will put a palm on housing in normal usage, care should be taken as follows.

(2)Keep the gap, for example 0.3 to 0.7mm,between bezel edge and T/P surface.

The reason is to avoid the bezel edge from contacting T/P surface that may cause a "short" with bottom layer(See Fig.4)

(3)Insertion a cushion material is recommended.

(4)The cushion material should be limited just on the busbar insulation paste area.

If it is over the transparent insulation paste area, a "short" may be occurred.

(5)There is one where a resistance film is left in the T/P part of the end of the pole.

Design to keep insulation from the perimeter to prevent from mis-operation and so on.

12-3-2) Mounting on display and housing bezel

- (1) In all cases, the T/P should be supported from the backside of the glass.
- (2) Do not use an adhesive-tape to bond it on the front of T/P and hang it to the housing bezel.
- (3) Never expand the T/P top layer (PET-film) like a balloon by internal air pressure.

The life of the T/P will be extremely short.

- (4) Top layer, PET, dimension is changing with environmental temperature and humidity.

Avoid a stress from housing bezel to top layer, because it may cause "waving".

- (5) The input to the Touchpanel sometimes distorts touch panel itself.

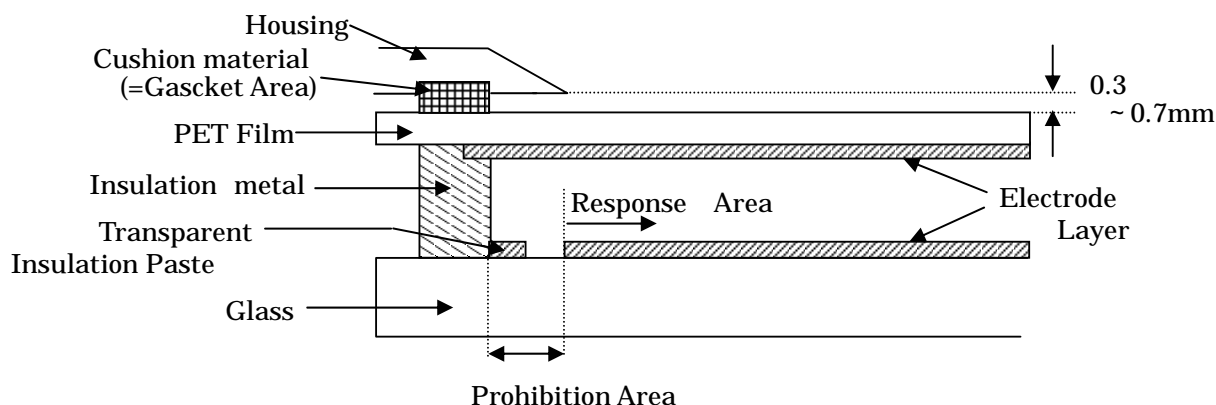


Fig.4

(13) Handling Precautions

13-1) Insertion and taking out of FPC

Be sure insert and take out of the FPC into the connector of the set after turning off the power supply on the set side.

13-2) Handling of FPC

FPC shall be bent only slit portion. The bending slit shall be bent uniformly on the whole slit portion with bending radius larger than 0.6mm, and only inner side (back side of the module).

Don't bend it outer side (display surface side).

Don't give the FPC too much force, for example, hanging the module with holding FPC.

13-3) Installation of the module

On mounting the module, be sure to fix the module on the same plane. Take care not to warp or twist the module.

13-4) Precaution when mounting

If water droplets and oil attaches to it for a long time, discoloration and staining occurs. Wipe them off immediately.

Glass is used for the TFT-LCD panel. If it is dropped or bumped against a hard object, it may be broken. Handle it with sufficient care.

As the CMOS IC is used in this module, pay attention to static electricity when handling it. Take a measure for grounding on the human body.

13-5) Others

The liquid-crystal is deteriorated by ultraviolet rays. Do not leave it in direct sunlight and strong ultraviolet rays for many hours.

If it is kept at a temperature below the rated storage temperature, it becomes coagulated and the panel may be broken. Also, if it is kept at a temperature above the rated storage temperature, it becomes isotropic liquid and does not return to its original state. Therefore, it is desirable to keep it at room temperature as much as possible.

If the LCD breaks, don't put internal liquid crystal into the mouth. When the liquid crystal sticks to the hands, feet and clothes, wash it out immediately.

Wipe off water drop or finger grease immediately. Long contact with water may cause discoloration or spots.

Observe general precautions for all electronic components.

VCOM must be adjusted on condition of your final product. No adjustment causes the deterioration for display quality.

(14)Forwarding form

- a) Piling number of cartons: MAX. 8
- b) Package quantity in one cartons: 200 pcs.
- c) Carton size: 525mm(W) × 360mm(D) × 225mm(H)
- d) Total mass of 1 carton filled with full modules: 9100 g

Fig.2 shows packing form.

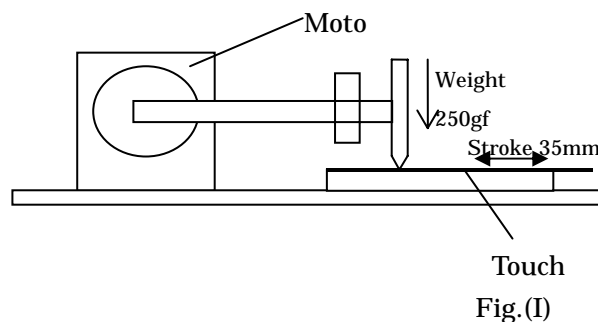
Environment

- (1)Temperature : 0 ~ 40
- (2)Humidity : 60%RH or less (at 40)
No dew condensation at low temperature and high humidity.
- (3)Atmosphere : Harmful gas, such as acid or alkali which bites electronic components and/or wires, must not be detected.
- (4)Period : about 3 months
- (5)Opening of the package : In order to prevent the LCD module from breakdown by electrostatic charges, please control the room humidity over 50%RH and open the package taking sufficient countermeasures against electrostatic charges, such as earth, etc.

(15) Reliability Test Conditions for TFT-LCD Module

Table 12

No.	Test items	Test conditions
1	High temperature storage test	Ta=+70 240h
2	Low temperature storage test	Ta=-20 240h
3	High temperature and high humidity operating test	Tp=+60 , 90%RH 240h (But no condensation of dew)
4	High temperature operating test	Tp=+55 240h
5	Low temperature operating test	Tp=-10 240h
6	Electro static discharge test	$\pm 200V \cdot 200pF(0)$ 1 time for each terminals
7	Shock test	980 m/s ² , 6 ms $\pm X, \pm Y, \pm Z$ 3 times for each direction (JIS C0041, A-7 Condition C)
8	Vibration test	Frequency range: 10Hz~55Hz Stroke: 1.5 mm Sweep: 10Hz~55Hz X,Y,Z 2 hours for each direction (total 6 hours) (JIS C0040, A-10 Condition A)
9	Heat shock test	Ta=-20 ~ +70 / 5 cycles (1h) (1h)
10	Point activation test (Touch panel)	Hit it 1,000,000 times with a silicon rubber of R8 HS 60. Hitting force :2.4N Hitting speed : 3 times per second
11	Writing friction resistance test (Touch panel)	Write according to the right illustration in the under -mentioned conditions: Pen : 0.8R Polyacetal stylus Load : 2.4N Speed : 3 strokes per second Stroke : 35mm Frequency : 300,000 times (one way) Testing apparatus : shown in Fig (I)



【Note】 Ta = Ambient temperature, Tp = Panel temperature

【Check items】

(a)Test No.1 ~ 9

In the standard condition, there shall be no practical problems that may affect the display function.

(b)Test No.10 ~ No.11

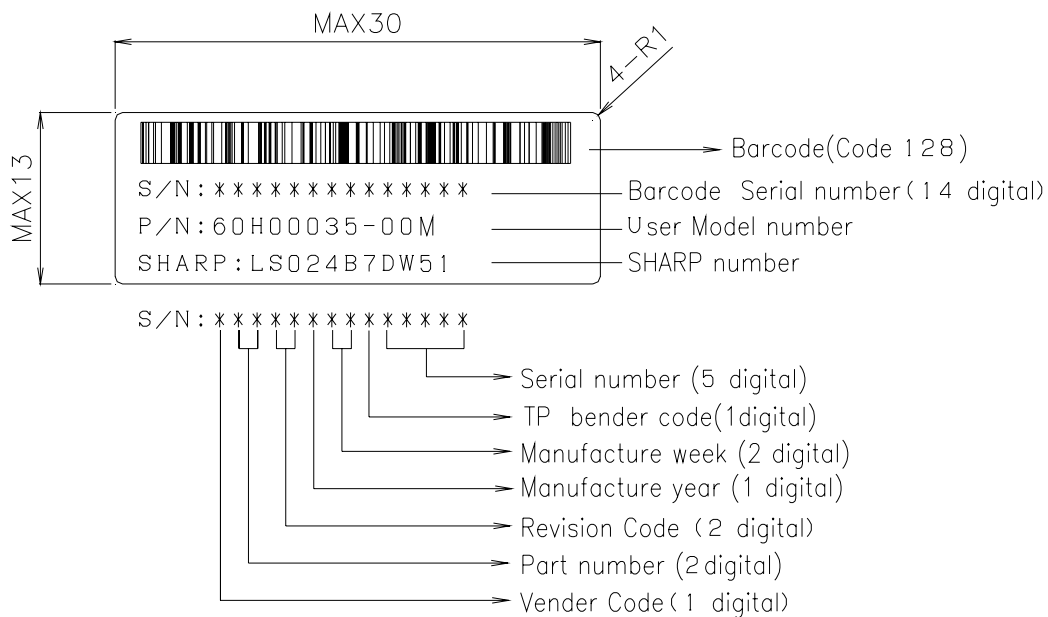
The measurements after the tests are satisfied (10)-Table 11 (Touch panel characteristics)

(16) Others

16-1) Indication of Serial number

The Serial number is shown on a label. Attached location is shown in Fig.1 (Outline Dimensions).

Indicated contents of the label



【S/N】 Vender Code : D / Part Number : CL / Revision Code : A1

Manufacture year : ex. 2 0 0 5 5

Manufacture week : The 1st Monday of the year thru the following Sunday is assigned as 1st week :01

The 2nd Monday of the year thru the following Sunday is assigned as 2nd week:02...

Serial Number : 0 0 0 0 1 ~ 9 9 9 9 9

Module Label

16-2) Used Regulation of Chemical Substances Breaking Ozone Stratum

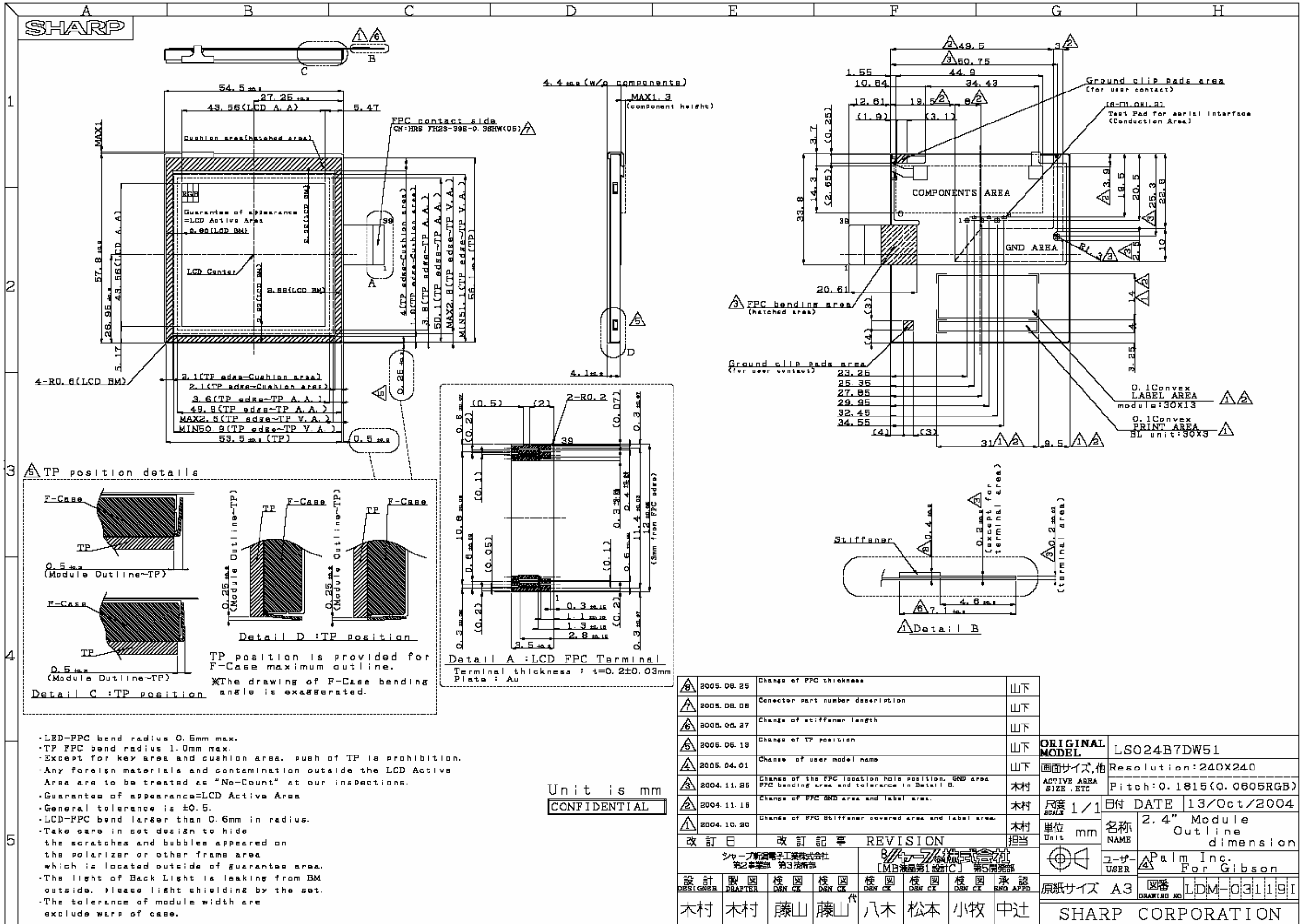
Substances with the object of regulation : CFCS, Carbon tetrachloride, Halon

1,1,1-Trichloro ethane (Methyl chloroform)

(a) This LCD module, Constructed part and Parts don't contain the above substances.

(b) This LCD module, Constructed part and Parts don't contain the above substances in processes of manufacture.

16-3) If some problems arise about mentioned items in this document and other items, the user of the TFT-LCD module and Sharp will cooperate and make efforts to solve the problems with mutual respect and good will.



•LED-FPC bend radius 0.6mm max.
 •TP FPC bend radius 1.0mm max.
 •Except for key area and cushion area, push of TP is prohibition.
 •Any foreign materials and contamination outside the LCD Active Area are to be treated as "No-Count" at our inspections.
 •Guarantee of appearance=LCD Active Area
 •General tolerance is ±0.5.
 •LCD-FPC bend larger than 0.6mm in radius.
 •Take care in set design to hide the scratches and bubbles appeared on the polarizer or other frame area which is located outside of guarantee area.
 •The light of Back Light is leaking from BM outside. Please light shielding by the set.
 •The tolerance of module width are exclude warp of case.

Unit is mm
CONFIDENTIAL

△	2005.08.25	Change of FPC thickness	山下
△	2005.08.08	Connector part number description	山下
△	2005.08.27	Change of stiffener length	山下
△	2006.06.19	Change of TP position	山下
△	2005.04.01	Change of user model name	山下
△	2004.11.25	Change of the FPC location hole position, GND area FPC bending area and tolerance in Detail B.	木村
△	2004.11.18	Change of FPC GND area and label area.	木村
△	2004.10.20	Change of FPC Stiffener covered area and label area.	木村
改訂日 改訂記事 REVISION 担当			
シャープ新電子工業株式会社 第2事業部 第3技術部		B/P 株式会社 【MB液晶第1設計C】 第5開発部	
設計	製図	検図	検図
DESIGNER	DRAWER	DSN CK	DSN CK
木村	木村	藤山	藤山
		検図	検図
		DSN CK	DSN CK
		八木	松本
		小牧	中辻
		承認	
		DSN APPR	
		原紙サイズ	A3
		図番	LDM-03119I
		SHARP CORPORATION	

ORIGINAL MODEL	LS024B7DW51
画面サイズ,他	Resolution:240X240
ACTIVE AREA SIZE, ETC	Pitch:0.1815(0.0605RGB)
尺度 1/1	日付 DATE 13/Oct/2004
名称	2.4" Module Outline dimension
ユーザ	Palm Inc. For Gibson
単位	mm
原紙サイズ	A3
図番	LDM-03119I

Fig1. Outline dimensions

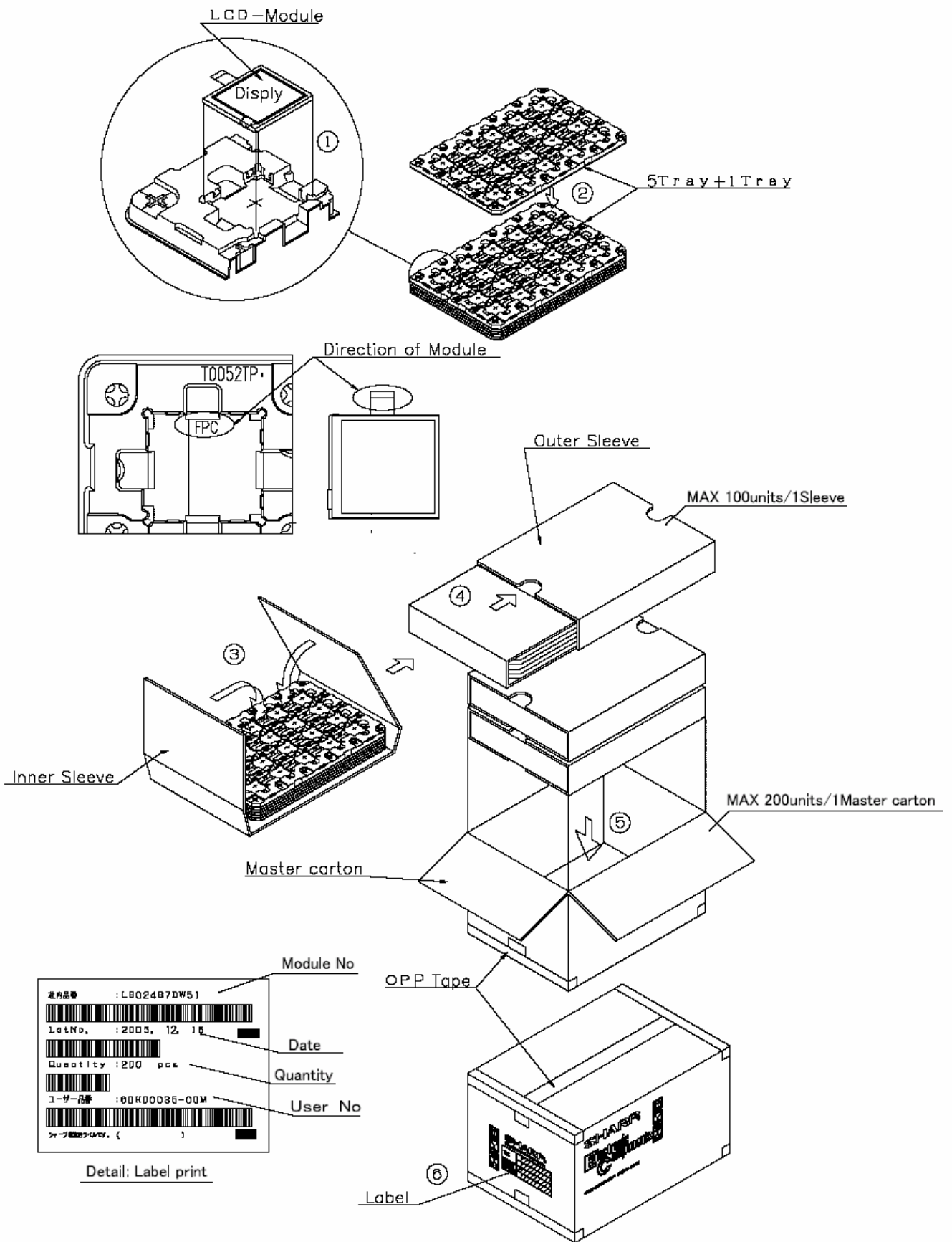


Fig2. Package Form