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	SPECIFICATION	

DEVICE SPECIFICATION FOR

TFT-LCD Module

MODEL No.

LQ057V3LG11

☐ CUSTOMER'S APPROVAL

DATE

BY

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RECORDS OF REVISION

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Table of contents

1 Applicable TFT-LCD module

This specification applies to a color TFT-LCD module, LQ057V3LG11.

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 IC, power supply circuit and a back light unit.

Graphics and texts can be displayed on a 640 × 480 × RGB dots panel with 262,144 colors by using LVDS (Low Voltage Differential Signaling) to interface, and supplying +3.3V DC supply voltage for TFT-LCD panel driving and supply voltage for backlight.

- Fine images with stripe aligned 307,200 pixels on 5.7 inch diagonal screen.
- Color display capability of 262,144 colors with 18 bit data signal (6 bits for each RGB).
- Wide Viewing Angle technology is adopted.
  (The most suitable viewing angle is in the 12 o'clock direction.)
- Reflection due to external light is minimized through the use of a low reflection black matrix .
- An inverted video display in the vertical / horizontal directions is possible.
- LED drive circuit is built in this module to provide PWM Dimmer function.
- This module is complied to RoHS directive.

3 Mechanical Specifications

Table 3.1

Items	Specifications	Unit
Display size (Diagonal)	14.4 (5.7")	cm
Active display area	115.2 (H) x 86.4 (V)	mm
Pixel format	640(H) x 480(V) x RGB	dot
	(1 pixel=R+G+B dots)	-
Aspect ratio	4:3	
Pixel pitch	0.180[H] x 0.180[V]	mm
Pixel configuration	R,G,B Stripe configuration	-
LCD mode	Normally white	-
Surface treatment	Glare and hard-coating 2H	-
Dimension*	144.0(W) x 104.6(H) x 12.3(D)	mm
Mass	Max.190	g

[Note3-1] Fig.6 shows dimensions of the module.

4 Input Signal Assignment

4-1. TFT-LCD panel driving

CN1 (LVDS signals, +3.3V DC power supply and LED power supply)

Pin No.	Symbol	Function	Remark
1	Vcc	+3.3V power supply	
2	Vcc	+3.3V power supply	
3	GND		
4	GND		
5	RxIN0-	Receiver signal of LVDS CH0 (-)	[Note 4-1]
6	RxIN0+	Receiver signal of LVDS CH0 (+)	[Note 4-1]
7	GND		[Note 4-2]
8	RxIN1-	Receiver signal of LVDS CH1 (-)	[Note 4-1]
9	RxIN1+	Receiver signal of LVDS CH1 (+)	[Note 4-1]
10	GND		[Note 4-2]
11	RxIN2-	Receiver signal of LVDS CH2 (-)	[Note 4-1]
12	RxIN2+	Receiver signal of LVDS CH2 (+)	[Note 4-1]
13	GND		[Note 4-2]
14	CK IN-	Receiver signal of LVDS CLK (-)	[Note 4-1]
15	CK IN+	Receiver signal of LVDS CLK (+)	[Note 4-1]
16	GND		[Note 4-2]
17	NC		[Note 4-4]
18	NC		[Note 4-4]
19	REV	Selection signal for horizontal vertical scanning direction (“L” or N.C. : Normally, “H” : Up-and-Down /Right-and-Left reversal)	
20	NC		[Note 4-5]

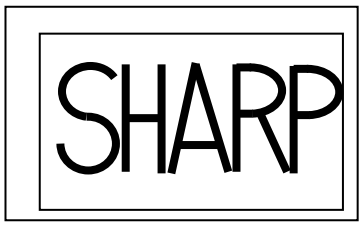
[Note 4-1] Relation between RxINi(i=0,1,2) and actual data is shown in following section (4-2)(7-2).

[Note 4-2] The shielding case is connected with signal GND.

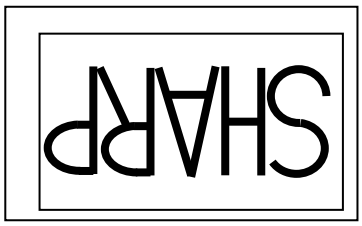
Using connector : DF19L-20P-1H (Hirose) or equivalent

Corresponding connector : DF19G-20S-1C (Hirose)

[Note 4-3]



REV＝L or N.C.



REV＝H

[Note 4-4] Please use NC by GND.

[Note 4-5] Please use NC by OPEN or GND. NC terminal is not connected with the internal circuit.

4-2. LVDS interface block diagram

Using receiver : Single LVDS interface integrated in a driver IC

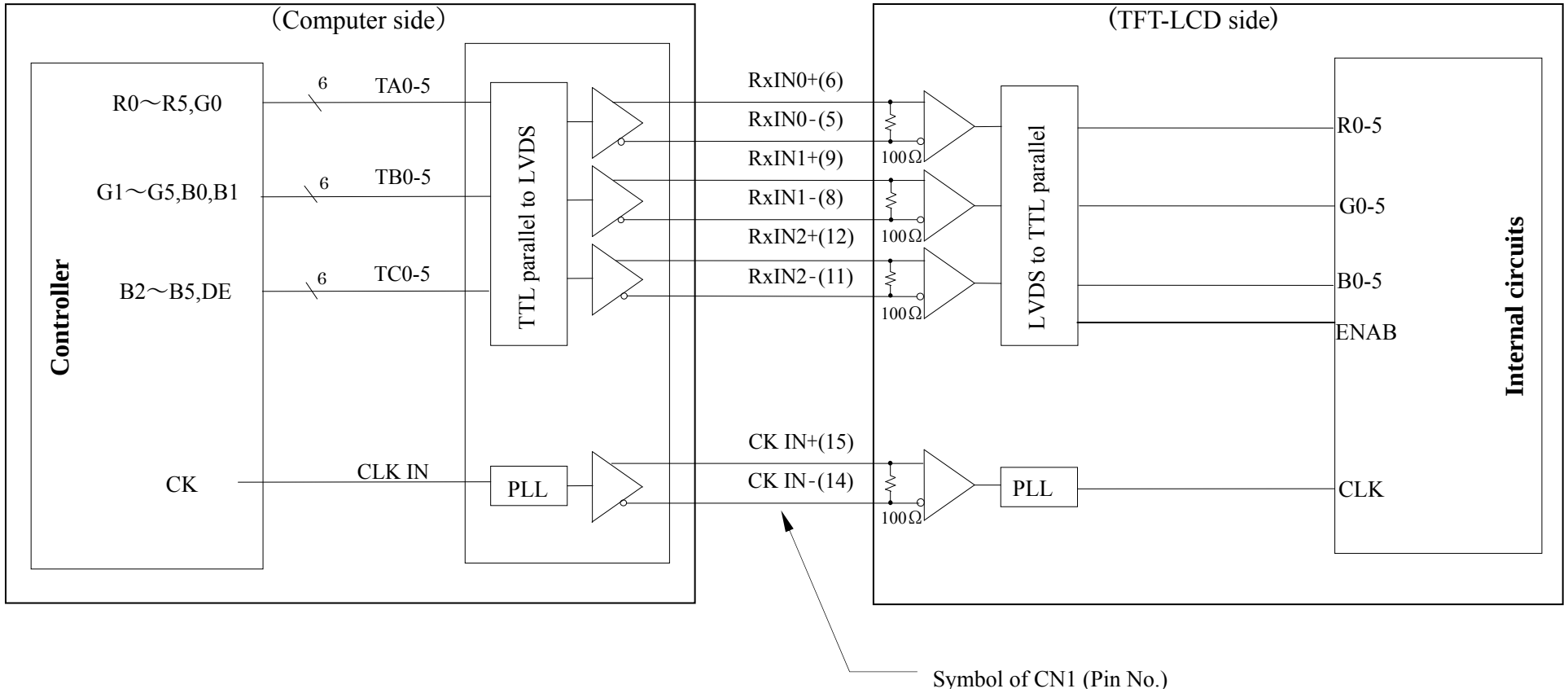


Fig1. LVDS interface block diagram

4-3 Backlight driving section

CN2

Using connector: SM06B-SRSS-TB(LS)(SN) (JST Mfg. Co., Ltd.)or equivalent.

Corresponding connector : SHR-06V-S-B,SHR-06V-S (JST Mfg. Co., Ltd.)

Pin No.	Symbol	Function	Remark
1	V_{DD}	+12.0V power supply	
2	V_{DD}	+12.0V power supply	
3	GND	GND	
4	GND	GND	
5	PWM	Brightness Adjust （PWM）	
6	Vst	LED Open	normal:5V, open error:0V

5 Absolute maximum ratings

Table 5-1

Parameter	Symbol	Condition	Ratings		Unit	Remark
			Min.	Max.		
+3.3V supply voltage	V_{CC}	Ta=25℃	0	+4.0	V	
+12V supply voltage	V_{DD}	Ta=25℃	0	+25	V	
Input voltage	V_{IN1}	Ta=25℃	-0.3	Vcc+0.3	V	[Note 5-1]
Input voltage	V_{IN2}	Ta=25℃	-0.3	V_{DD}+0.3	V	[Note 5-2]
Storage temperature	Tstg	—	-30	+80	℃	[Note5-3,4,5]
Operating temperature (Panel surface)	Topp	—	-20	+70	℃	

[Note5- 1] LVDS signals

[Note5- 2] PWM

[Note5- 3] Maximum wet-bulb temperature is less than 39℃. Dew condensation must be avoided as electrical current leaks will occur, causing a degradation of performance specifications.

[Note5-4] The operating temperature guarantees only operation of the circuit. For contrast, response time and other factors related to display quality, judgment is done using the ambient temperature Ta =＋25℃.

[Note5- 5] Take care not to overrun ratings above.

[Note5- 6] Under the environment between 65℃ and 80℃, it may cause display non-uniformity issue, etc.

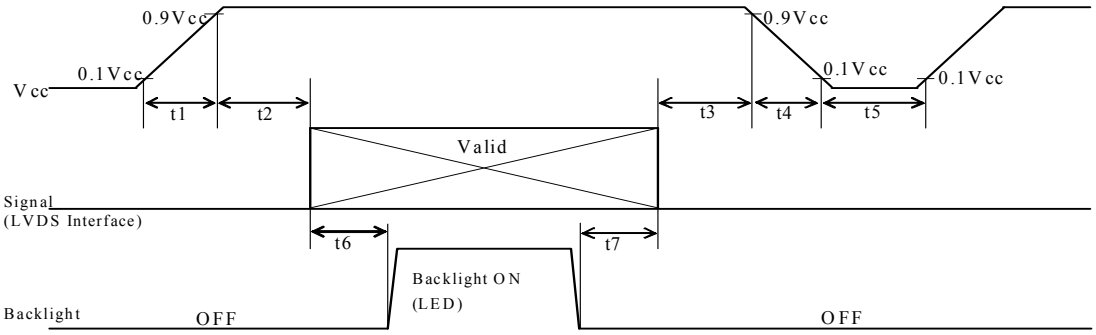
6 Electrical characteristics

6-1. TFT-LCD Panel driving section

Table 6-1 Ta＝+25℃

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Supply voltage		VCC	+3.0	+3.3	+3.6	V	[Note 6-1]
Current dissipation		Icc	—	100	150	mA	[Note 6-2]
Permissive input ripple voltage		V_{RP}	—	—	100	mV_{P-P}	Vcc = +3.3V
Input voltage range		V_I	0	—	Vcc	V	LVDS signals
Differential input threshold voltage	High	V_{TH}	—	—	+100	mV	V_{CM} = +1.2V [Note 6-3]
	Low	V_{TL}	–100	—	—	mV	
Input voltage2 (“High” state)		V_{IH2}	2.1	—	—	V	Vcc=+3.0V [Note 6-7]
Input voltage2 (“Low” state)		V_{IL2}	—	—	0.8	V	Vcc=+3.6V [Note 6-7]
Input current1 (High)		I_{OH1}	—	—	10	μA	V_I = +2.4V Vcc = +3.6V
Input current 2(High)		I_{OH2}	—	—	400	μA	Vcc = +3.6V [Note 6-7]
Input current 1(Low)		I_{OL1}	—	—	10	μA	V_I = 0V Vcc = 3.6V
Input current 2(Low)		I_{OL2}	—	—	1	μA	Vcc = 0V [Note 6-7]
Terminal resistor		R_T	—	100	—	Ω	Differential input

[Note6-1] On-off conditions for supply voltage

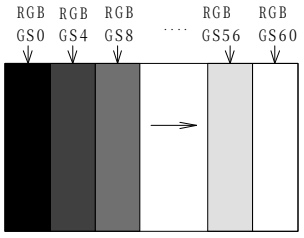


Symbol	Min.	Max.	Unit	Remarks
t1	0	10	ms	
t2	0	100	ms	
t3	0	100	ms	
t4	0	100	ms	
t5	1	—	s	
t6	11	—	frame	[Note 6-4]
t7	3	—	frame	[Note 6-4]

[Note 6-2] Typical current situation :

16-gray-bar pattern.

Vcc=+3.3V



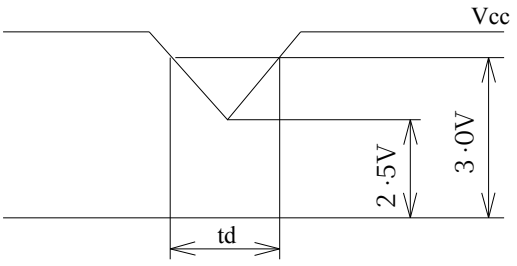
[Note 6-3] V_{CM} : Common mode voltage of LVDS driver.

[Note 6- 4] It is recommended to consider some timing difference between LVDS input and Backlight input as shown above.
If the Backlight lights on before LCD starting, or if the Backlight is kept on after LCD stopping, the screen may be projected white for a moment or abnormal image may be displayed. This is caused by variation in output signal from timing generator at LVDS input on or off. It does not cause the damage to the LCD module.

[Note 6- 5] Every Signal is LVDS and CMOS Input, Hi-Z is prohibited when VCC is on level.

[Note 6- 6] Vcc-dip conditions

1) At 2.5V ≤ Vcc < 3.0V
   td ≤ 10 ms
2) At Vcc < 2.5V
   Vcc dip conditions should also follow the Vcc turn-on/off conditions



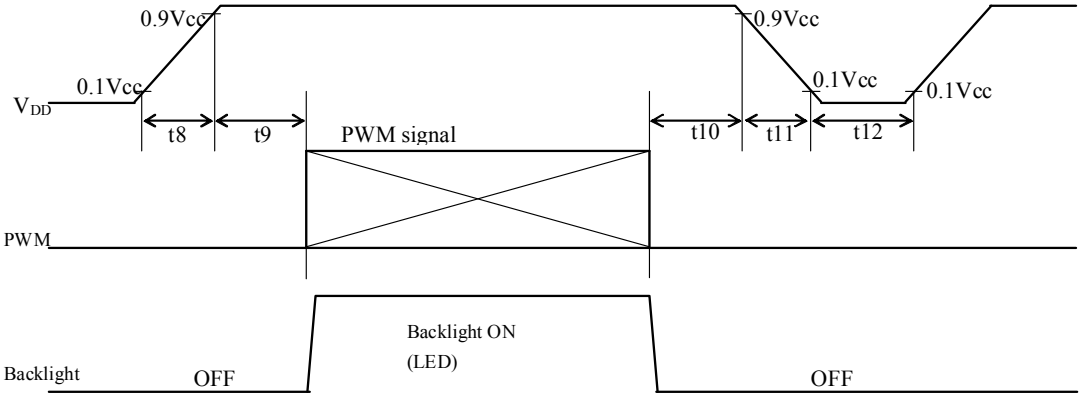
[Note 6-7] REV

6-2 Backlight driving section

The backlight system is an edge-lighting type with white-LED.
(It is usually required to measure under the following condition.
condition: Ta=25℃±2℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply voltage	V_{DD}	11.2	12.0	12.6	V	[Note6-8]
Current dissipation	I_{DD}	—	150		mA	V_{DD} = 12.0V PWM Duty =100%
Signal Low voltage	V_{PWML}	-	-	0.4	V	PWM [Note6-9]
Signal High voltage	V_{PWMH}	2.0	-	V_{DD}	V	
PWM frequency	f_{PWM}	100	-	300	Hz	[Note6-9]
PWM Duty	—	1	-	100	%	[Note6-9]
"LED Open " signal	Vst_H	-	5.0	-	V	Normal
	Vst_L	-	-	0.6	V	LED open

[Note 6-8] On-off conditions for B/L supply voltage



Symbol	Min.	Max.	Unit	Remarks
t8	0.1	10	ms	
t9	100	-	ms	
t10	100	-	s	
t11	0	100	ms	
t12	1	—	s	

[Note6-9]

PWM Dimmer function

PWM Dimmer function can be available by input PWM pulse.(PWM = High : ON , PWM = Low : OFF)

・Please do not make the "PWM" terminal in a floating state (no input state).

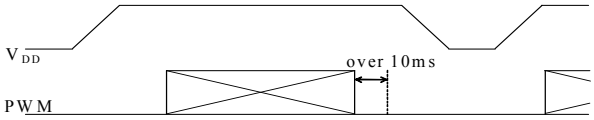
・Please input "PWM" signal after V_{DD}(12V) is supplied.

・Please turn off V_{DD}(12V) after "PWM" signal is stopped.

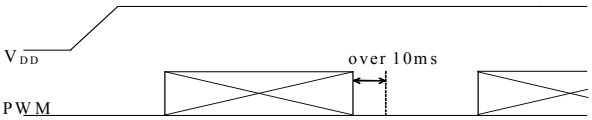
・Please turn off V_{DD}(12V) ,when PWM signal is set "L" over 10ms.

If PWM signal is set "L->H"without reset V_{DD} ,Softstart funcion of LED driver is invalid and inrush current may occur.

OK



NG



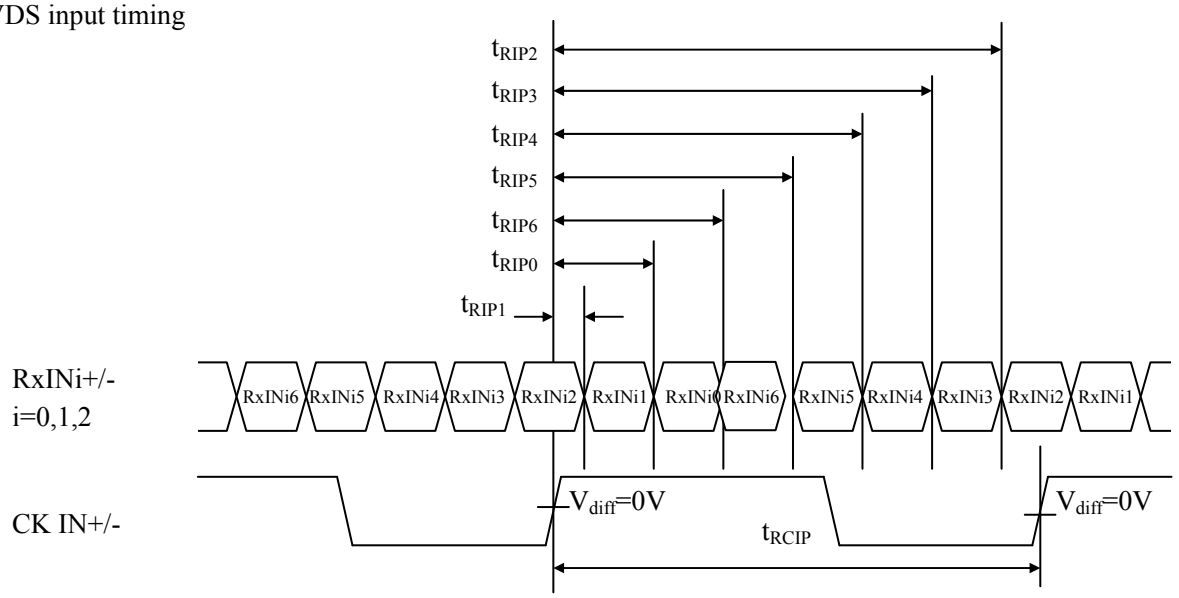
6-3. LVDS input specification

6-3.1. AC characteristics

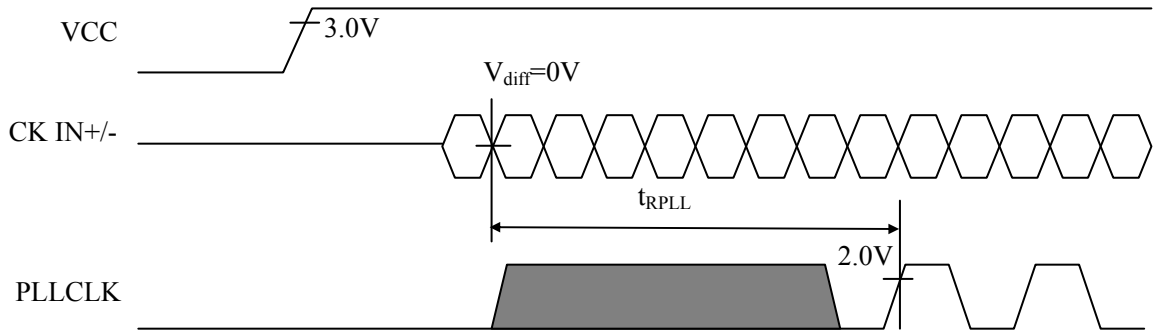
Vcc=+3.0V～+3.6V, Ta＝-20℃～+70℃

Parameter	Symbol	Min	Typ.	Max.	Unit
Input Data Position 0 (tRCIP=40ns)	t_{RIP1}	-0.25	0.0	+0.25	ns
Input Data Position 1 (tRCIP=40ns)	t_{RIP0}	t_{RCIP}/7-0.25	t_{RCIP}/7	t_{RCIP}/7+0.25	ns
Input Data Position 2 (tRCIP=40ns)	t_{RIP6}	2 t_{RCIP}/7-0.25	2 t_{RCIP}/7	2 t_{RCIP}/7+0.25	ns
Input Data Position 3 (tRCIP=40ns)	t_{RIP5}	3 t_{RCIP}/7-0.25	3 t_{RCIP}/7	3 t_{RCIP}/7+0.25	ns
Input Data Position 4 (tRCIP=40ns)	t_{RIP4}	4 t_{RCIP}/7-0.25	4 t_{RCIP}/7	4 t_{RCIP}/7+0.25	ns
Input Data Position 5 (tRCIP=40ns)	t_{RIP3}	5 t_{RCIP}/7-0.25	5 t_{RCIP}/7	5 t_{RCIP}/7+0.25	ns
Input Data Position 6 (tRCIP=40ns)	t_{RIP2}	6 t_{RCIP}/7-0.25	6 t_{RCIP}/7	6 t_{RCIP}/7+0.25	ns
Phase Lock Loop Set	t_{RPLL}	—	—	10	ms
Input Clock Period	t_{RCIP}	36.4	40	44.4	ns

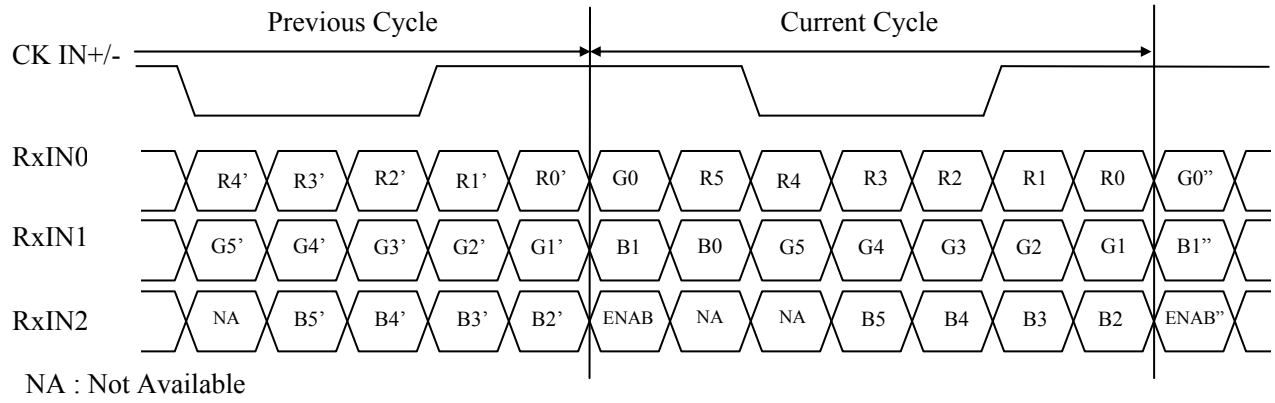
LVDS input timing



LVDS phase lock loop set



6-3.2.LVDS data



NA : Not Available

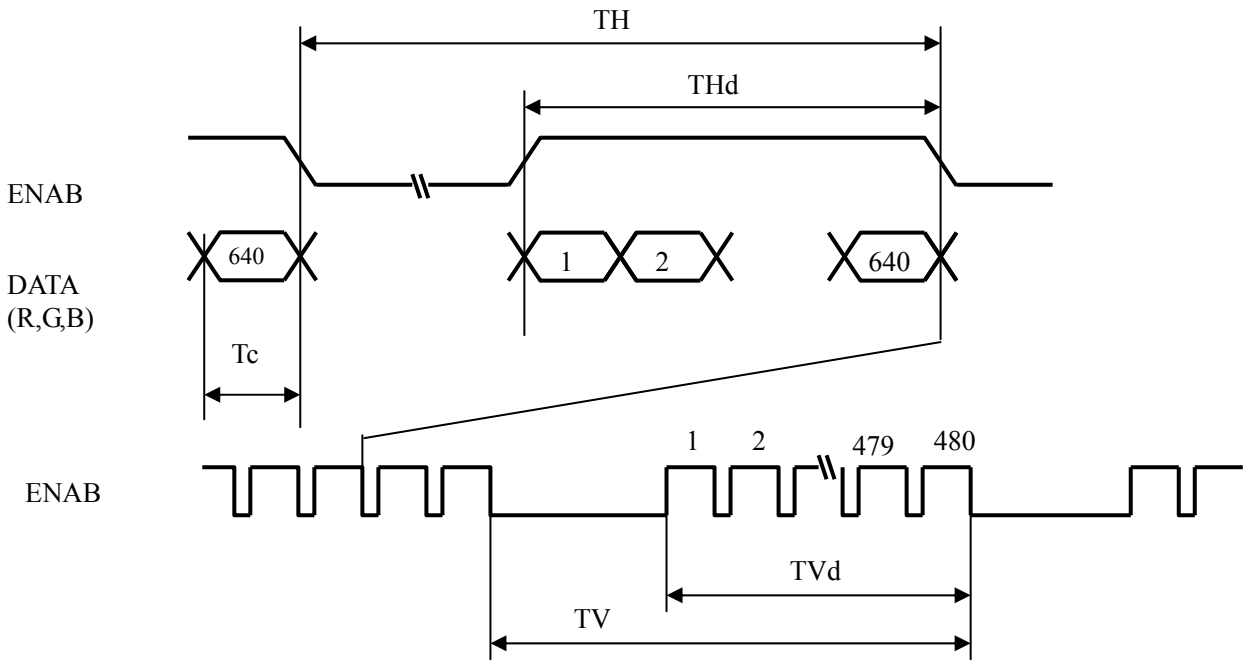
7 Timing Characteristics of input signals

7-1. Timing characteristics

Table 7-1

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Clock	Frequency	1/Tc	22.5	25	27.5	MHz	[Note7-1]
ENAB	Horizontal period	TH	750	800	900	clock	
			22.1	32.0	-	μs	
	Horizontal period (High)	THd	640	640	640	clock	
	Vertical period	TV	500	525	600	line	
			—	16.8	—	ms	
	Vertical period (High)	TVd	480	480	480	line	

[Note7-1] In case of lower frequency, the deterioration of display quality, flicker etc., may be occurred.



7-2. Input Data Signals and Display Position on the screen

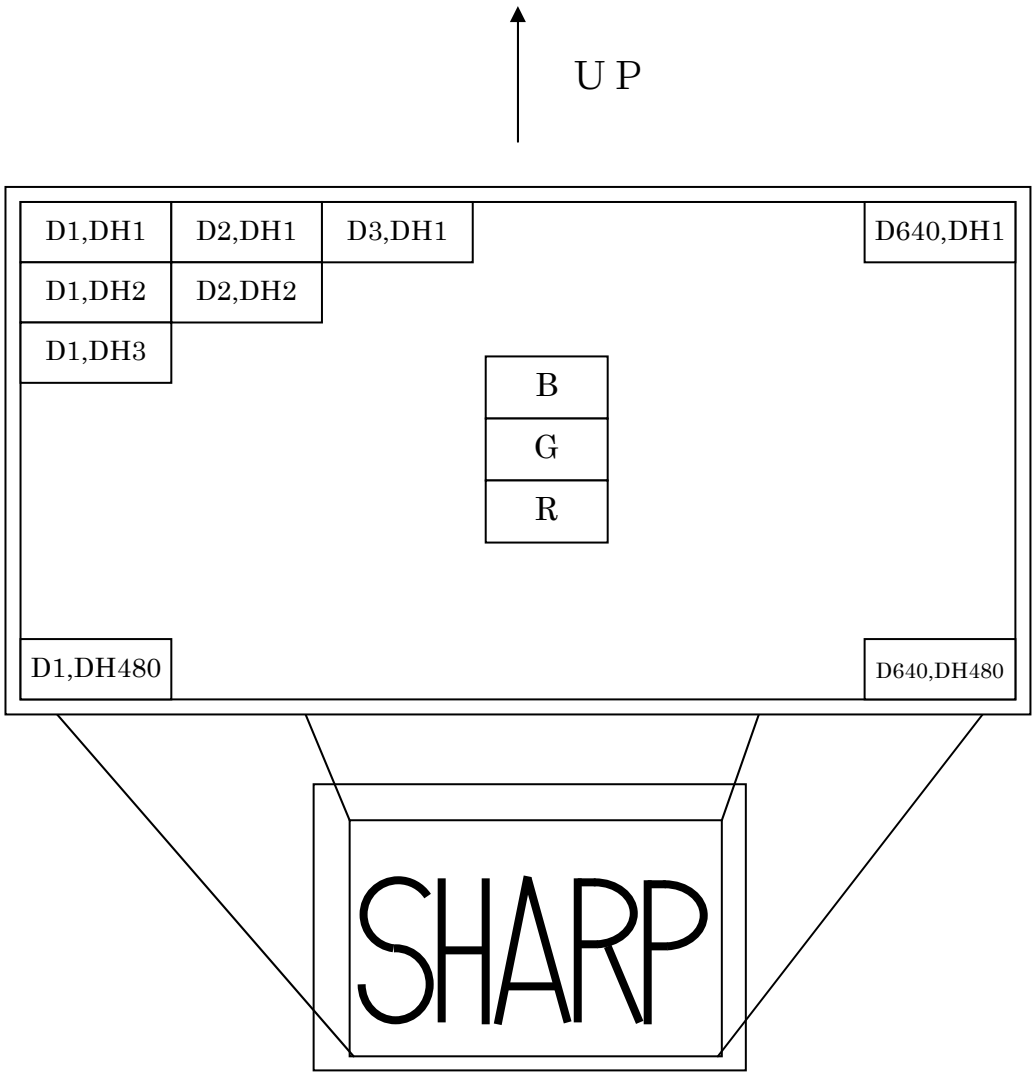


Fig2. Display position of input data(H・V)

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

Table 8-1

	Colors & Gray scale	Data signal																	
		Gray Scale	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 bleu	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
	Bleu	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 Specification

Table 9-1 Ta=25°C, Vcc=3.3V

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angle Range	Horizontal	θ21, θ22	CR≧10	—	70	-	° (Deg.)	[Note9-1,3]
	Vertical	θ11		—	70	-	° (Deg.)	
		θ12		—	50	-	° (Deg.)	
Contrast ratio		CR max	Best viewing Angle	—	500	-	-	[Note9-2,4,6]
Response time	Rise time	Tr +Td	θ = 0°	—	30	-	ms	[Note9-2,5,6]
Chromaticity of white		x	θ = 0°	0.263	0.313	0.363	-	[Note9-2,6]
		y		0.279	0.329	0.379	-	
Luminance of white		Y_{L1}		280	350	-	cd/m^2	[Note9-2,6] (PWM=100%)

※ The measurement shall be executed 30 minutes after lighting at rating. Condition : (PWM=100%)
The optical characteristics shall be measured in a dark room or equivalent.

[Note 9-1] Measuring Viewing Angle Range

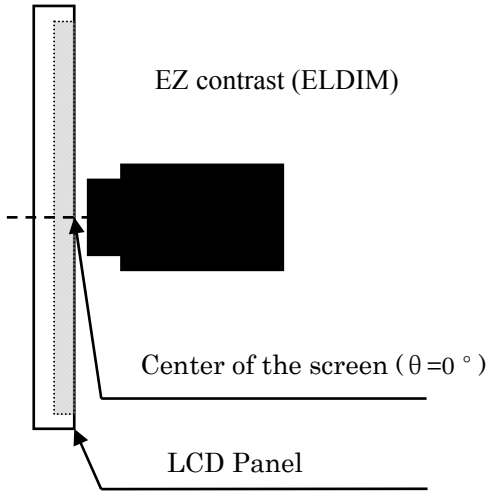


Fig3 Measuring Viewing Angle Range

[Note 9-2] Other Measurements

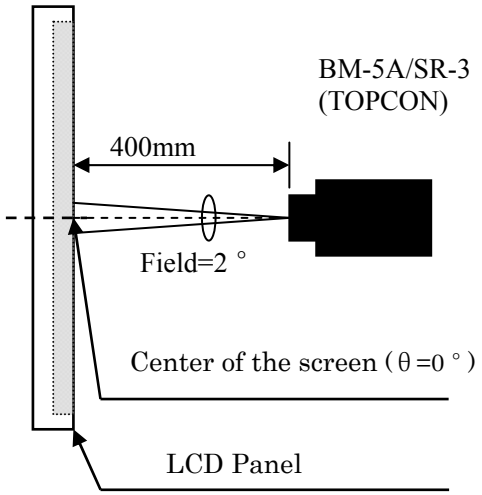
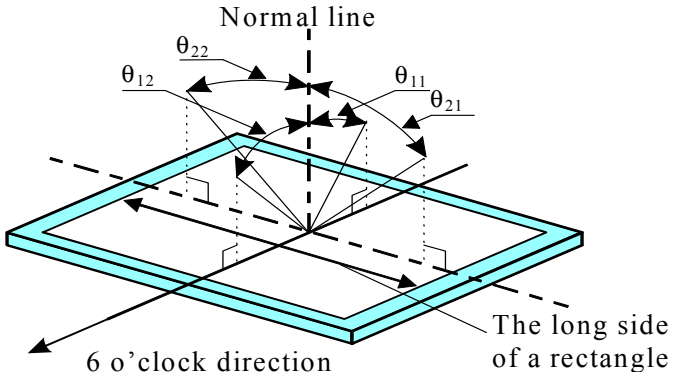


Fig4. Other Measurements

[Note9-3] Definitions of viewing angle range:



The best viewing angle of this module is slightly leaned to 12 o'clock from normal line.
Where $\theta_{11} > \theta_{max}$, gray scale is reversed partially.
Where $\theta_{11} < \theta_{max}$, or in θ_{12} direction, gray scale isn't reversed.

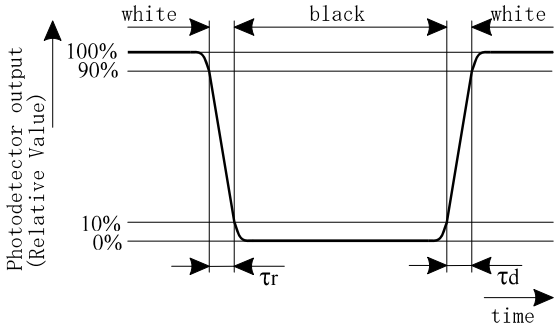
[Note9-4] Definition of contrast ratio:

The contrast ratio is defined as the following.

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

[Note9-5] Definition of response time:

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



[Note9-6] This parameter should be measured at the center of the screen .

10 Display Qualities

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. Observe all other precautionary requirements in handling components.
h) This module has its circuitry PCBs on the rear side and should be handled carefully in order not to be stressed.
i) Protect sheet(Laminate film) is attached to the module surface to prevent it from being scratched. Peel the sheet off slowly just before the use with strict attention to electrostatic charges. Ionized air shall be blown over during the action. Blow off the 'dust' on the polarizer by using an ionized nitrogen gun, etc. Working under the following environments is desirable.
   - All workers wear conductive shoes, conductive clothes, conductive fingerstalls and grounding belts without fail.
   - Use Ionized blower for electrostatic removal, and peel of the protect sheet with a constant speed. (Peeling of it at over 2 seconds)

j) The polarizer surface on the panel is treated with Anti-Glare for low reflection. In case of attaching protective board over the LCD, be careful about the optical interface fringe etc. which degrades display quality.
k) Do not expose the LCD module to a direct sunlight, for a long period of time to protect the module from the ultra violet ray.
l)Connect GND to flame of module to stabilize against EMI and external noise.
m) When handling LCD modules and assembling them into cabinets, please be noted that long-term storage in the environment of oxidization or deoxidization gas and the use of such materials as reagent, solvent, adhesive, resin, etc. which generate these gasses, may cause corrosion and discoloration of the LCD modules.
n)Reference torque for mouting (4-mounting holes at rear side)：0.4 +/- 0.04 N･m.
It depneds on screw and mounting arrangement.Check torque value in your instrument.
o) Liquid crystal contained in the panel may leak if the LCD is broken. Rinse it as soon as possible if it gets inside your eye or mouth by mistake.
p) Disassembling the module can cause permanent damage and should be strictly avoided.
Please don't remove the fixed tape, insulating tape etc that was pasted on the original module.
(Except for protection film of the panel.)
q) Be careful when using it for long time with fixed pattern display as it may cause afterimage.
(Please use a screen saver etc., in order to avoid an afterimage.)
r) If a minute particle enters in the module and adheres to an optical material, it may cause display non-uniformity issue, etc. Therefore, fine-pitch filters have to be installed to cooling and inhalation hole if you intend to install a fan.
s) Epoxy resin (amine series curing agent), silicone adhesive material (dealcoholization series and oxime series),
tray forming agent (azo compound) etc, in the cabinet or the packing materials may induce abnormal display with polarizer film deterioration regardless of contact or noncontact to polarizer film.
Be sure to confirm the component of them.
t) Do not use polychloroprene. If you use it, there is some possibility of generating Cl_2 gas that influences the reliability of the connection between LCD panel and driver IC.
u) Do not put a laminate film on LCD module, after peeling of the original one. If you put on it, it may cause discoloration or spots because of the occurrence of air gaps between the polarizer and the film.
v) The LED used for this product is very sensitive to the temperature. Luminance decreases rapidly when it is used for a long time under the environment of the high temperature.
Please consult our company when it is used under the environment like the above mentioned.

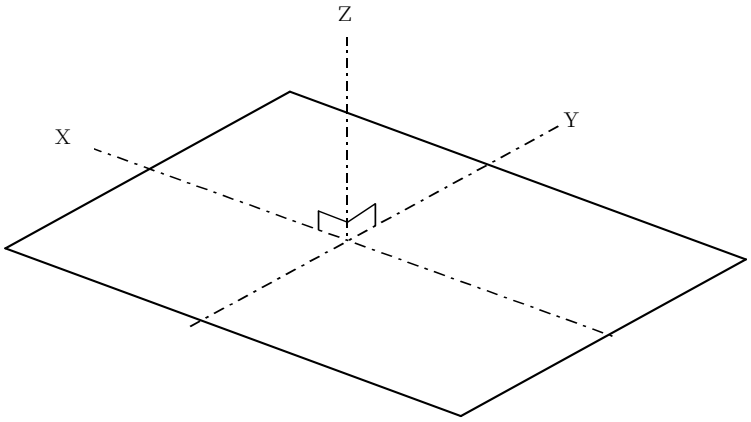
12 Reliability Test Items.

No.	Test parameter	Conditions
1	High temperature storage test	Leaves the module at Ta=80°C for 240h
2	Low temperature storage test	Leaves the module at Ta=-30°C for 240h
3	High temperature & high humidity operation test	Operates the module at Ta=40°C; 95%RH for 240h (No condensation)
4	High temperature operation test	Operates the module with +70°C at panel surface for 240h
5	Low temperature operation test	Operates the module at Ta=-20°C for 240h
7	Shock test (non- operating)	Max. acceleration : 490m/s^2 Pulse width : 11ms, half sine wave Direction : ±X,±Y,±Z once for each direction.
8	Vibration test (non- operating)	Frequency : 10 ~57Hz/Vibration width (one side):0.153 mm : 57~500Hz/ acceleration:19.6m/s^2 Sweep time : 11 minutes Test period :1 hour for each direction of X,Y,Z (total 3 hours)

[Result Evaluation Criteria]

Under the display quality test conditions with normal operation state, these shall be no change which may affect practical display function. (normal operation state：Temperature:15～35℃, Humidity:45～75%, Atmospheric pressure:86～106kpa)

[Note 12-1] The directions of X, Y, Z are defined as below:



13 Packing Form

13-1 Fig.5 shows packaging form.

13-2 Carton stock conditions

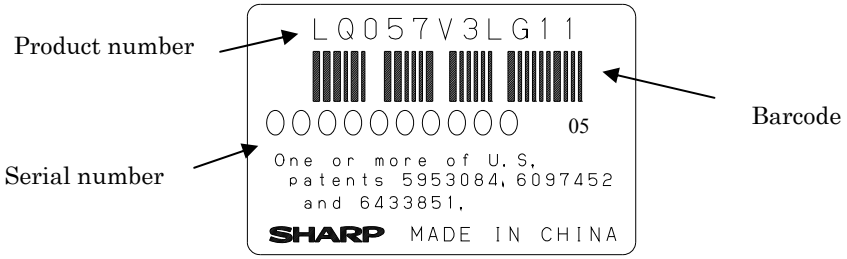
a) Maximum number of Carton being stuck: Max. 11 cartons
b) Maximum number of product contained: 20 Unit
c) Carton size: 442mm(W) ×390mm(H) ×170mm(D)
d) Total mass (for 20Unit): Approximately 5.9kg
e) Carton stock environment:
Temperature: 0 ~ 40°C
Humidity: below 60%RH
Direct sun light:
Please keep the product in a dark room or cover the product to protect from direct sun light.
Atmospheric condition:
Please refrain from keeping the product with possible corrosive gas or volatile flux.
Prevention of dew:
* Please store the product carton either on a wooden pallet or a stand / rak to prevent dew.
Do not place directly on the floor. In addition, to obtain moderate ventilation in between the pallet's top and bottom surfaces, pile the cartons up in a single direction and in order.
* Please place the product cartons away from the strage wall.
* Please maintain the storage area with an appropriate ventilation. It is recommendable to furnish the storage area with equipments such as ventilation systems.
* Please maintain the ambient temperature within the range of natural environmental fluctuation.
f)Storage term: 1year

14 Marking of product name

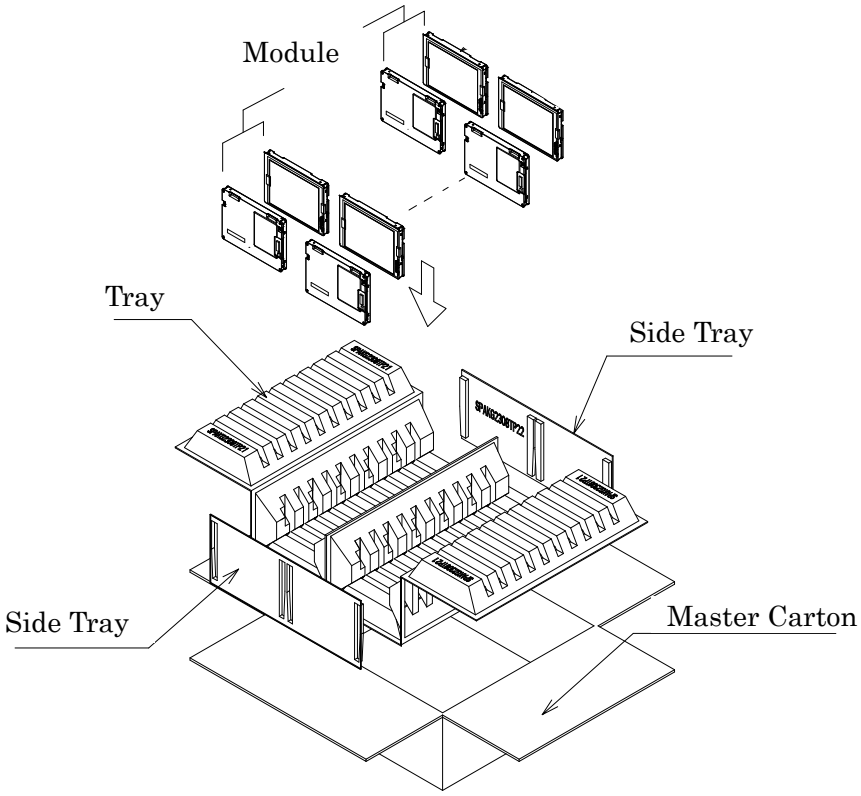
14-1 Barcode label print

Serial No. consists of 10 numbers. The role of each number is as follows:

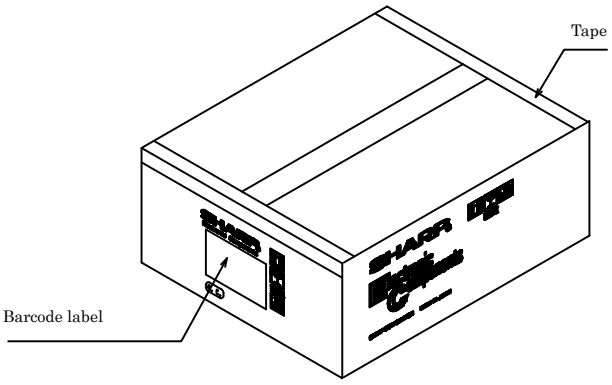
1st: last number of the year of manufacture (0-9)
2nd: month of manufacture (1-9,X,Y,Z)
3rd-4th: SHARP handling No. (0W or 0X)
5th: manufacturing location (D)
6th-10th: serial No. (0-9)



ex. The 12th product of Dec. 2011 = 1Z0WD00012



20 modules in each carton



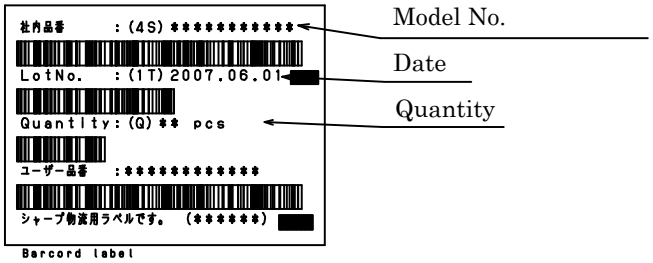
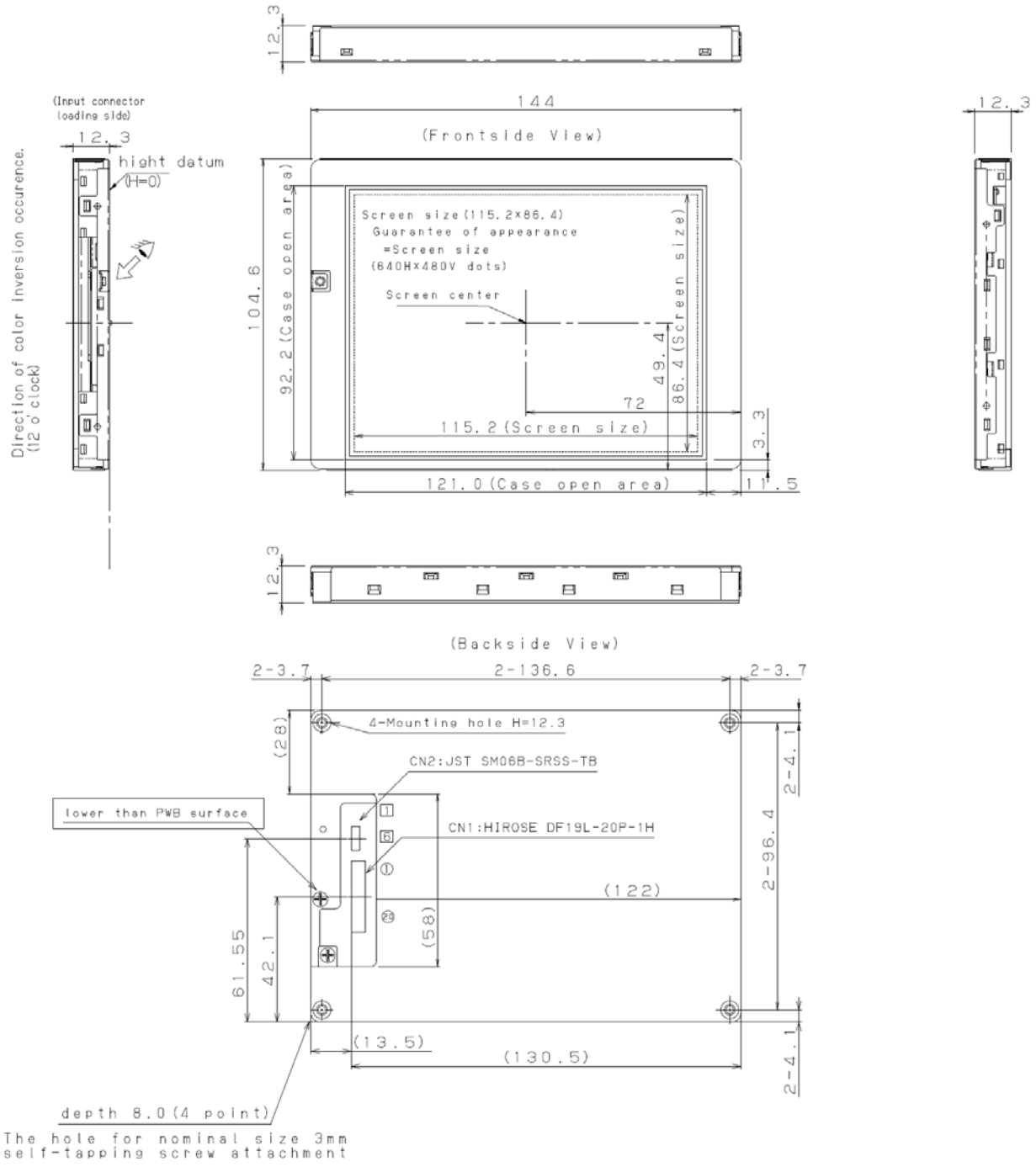


Fig. 5: Packing Form



1) Unspecified tolerance is ±0.5.
2) Warp or flating for PCB and chassis are excluded from thickness and dimension of the unit.

Fig. 6: Outline Dimensions