DEVICE SPECIFICATION FOR

TFT–LCD Module

MODEL No.

LQ121S1LG84

These parts have corresponded with the RoHS directiv

☐ CUSTOMER'S APPROVAL
BY _____

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SHARP CORPORATION

RECORDS OF REVISION

Model No. : LQ121S1LG84

SPEC No.	DATE	REVISED No	PAGE	SUMMARY	NOTE
LD-23301A	2011/3/5			－	
LD-23301B	2012/2/15	△1	P.6	Error correction (×)The VCC power … ⇒(○)The VDD power …	
			P.15	(non-operating) is added to vibration test and shock test.	
LD-23301A	2012/12/12	△2	6	Update 【*2】 in 5.Absolute Maximun Ratings	
			8	Update Timing characteristions "6.2 LED backlight" Changed VBR active timing (t11)	
			9	Added VBR(PWM) regulater values and Remark 【*7】	
			－	Delete unnecessary page. (overlapped page "7. Timing characteristics of input signals")	
			15	Update 10. Handling Precauions	

- Contents -

1. Application

This specification applies to the color TFT-LCD module LQ121S1LG84.

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The device listed in this specification was designed and manufactured for use in general electronic equipment.

In case of using the device for applications such as control and safety equipment for transportation (controls of aircraft, trains, automobiles, etc.), rescue and security equipment and various safety related equipment which require higher reliability and safety, take into consideration that appropriate measures such as fail-safe functions and redundant system design should be taken.

Do not use the device for equipment that requires an extreme level of reliability, such as aerospace applications, telecommunication equipment (trunk lines), nuclear power control equipment and medical or other equipment for life support.

SHARP assumes no responsibility for any damage resulting from the use of the device which does not comply with the instructions and the precautions specified in this specification.

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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, power supply circuit and a White-LED Backlight unit. Graphics and texts can be displayed on a 800×RGB×600dots panel with about 262144 colors colors by using LVDS (Low Voltage Differential Signaling) and supplying +3.3V DC supply voltages for TFT-LCD panel driving and +12.0V DC supply voltage for backlight.

The TFT-LCD panel used for this module is a high-brightness and high-contrast image.

The maximum viewing angle is in the 6o'clock direction.
The 12o'clock direction is difficult to reverse the grayscale.

The LED driver circuit is built into the module.

3. Mechanical technical literatures

Parameter	technical literatures	Unit
Display size	31(12.1inch)Diagonal	cm
Active area	246.0(H)×184.5(V)	mm
Pixel format	800(H)×600(V) (1pixel=R+G+B dot)	pixel
Aspect ratio	4:3	
Pixel pitch	0.3075(H)×0.3075(V)	mm
Pixel configuration	R,G,B vertical stripe	
Display mode	Normally white	
Unit outline dimensions (*1)	276.0(W)×209.0(H)×9.1(D)	mm
Mass	600	g
Surface treatment	Anti-glare and hard-coating 3H	

(*1) excluding the area of the connector cover.

Outline dimensions are shown in Fig.1.

4. Input Terminals

4-1. TFT-LCD panel driving

CN1（Interface signals and +3.3V power supply）

Using connectors： FI-SEB20P （Japan Aviation Electronics industry Co., Ltd.)

Corresponding connectors： FI-SE20M or FI-S20S

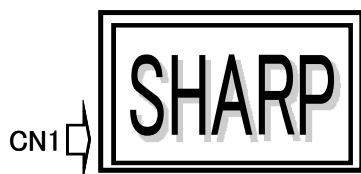（Japan Aviation Electronics industry Co., Ltd.)

Using LVDS receiver： Building into cotroll IC（THC63LVDF84B（Thine electronics） or Compatible product)

Corresponding LVDS transmitter：THC63LVDM83R（Thine electronics） or Compatible product

CN1

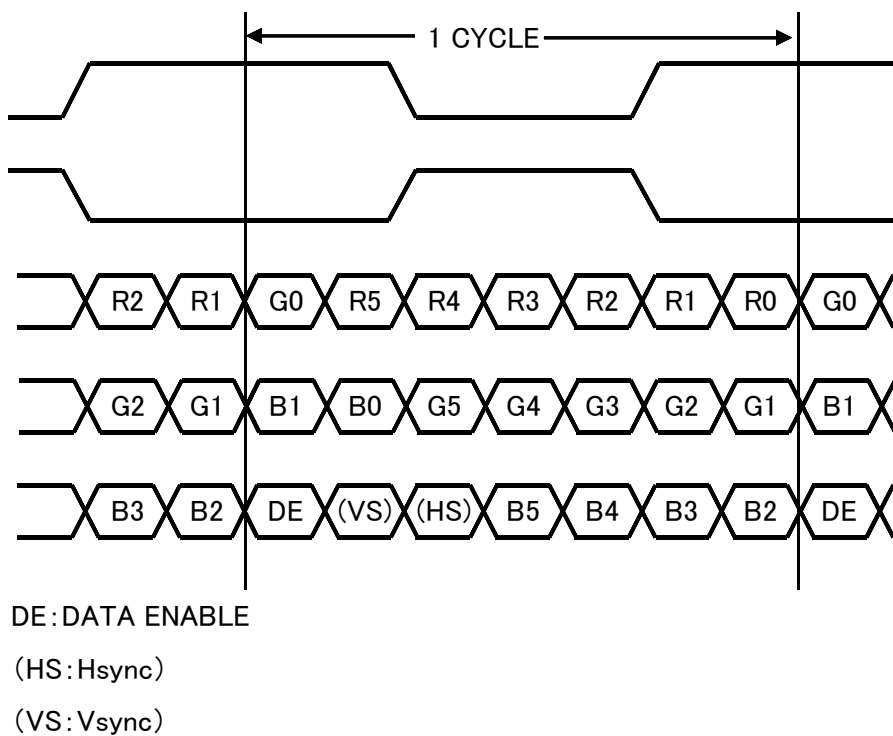| Pin	Symbol	Function	Remark
1	Vcc	+3.3V Power supply	
2	Vcc	+3.3V Power supply	
3	GND	GND	
4	GND	GND	
5	RxIN0−	LVDS receiver signal CH0 (−)	LVDS
6	RxIN0+	LVDS receiver signal CH0 (+)	LVDS
7	GND	GND	
8	RxIN1−	LVDS receiver signal CH1 (−)	LVDS
9	RxIN1+	LVDS receiver signal CH1 (+)	LVDS
10	GND	GND	
11	RxIN2−	LVDS receiver signal CH2 (−)	LVDS
12	RxIN2+	LVDS receiver signal CH2 (+)	LVDS
13	GND	GND	
14	CK IN−	LVDS receiver signal CK (−)	LVDS
15	CK IN+	LVDS receiver signal CK (+)	LVDS
16	GND	GND	
17	NC	Non Conection	
18	RL/UD		*1
19	GND	GND	
20	GND	GND	

【*1】 RL/UD = LOW   RL/UD = HIGH

CN1 ▷ [SHARP]   CN1 ▷ [SHARP (upside down)]

1 CYCLE

R2	R1	G0	R5	R4	R3	R2	R1	R0	G0
G2	G1	B1	B0	G5	G4	G3	G2	G1	B1
B3	B2	DE	(VS)	(HS)	B5	B4	B3	B2	DE

DE：DATA ENABLE

（HS：Hsync）

（VS：Vsync）

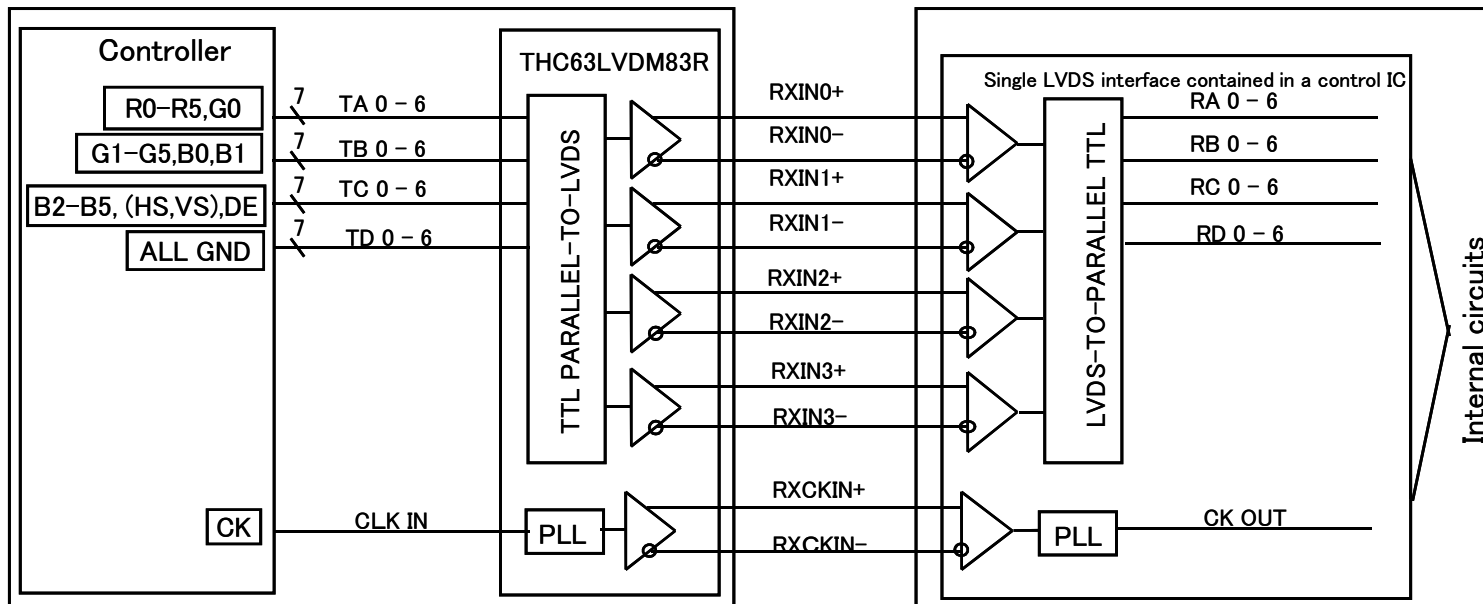## 4-2. Interface block diagram

（Computer Side）   （TFT-LCD side）

4-3. LED backlight

LED backlight connector

CN2 Used connector : SM06B-SHLS-TF (J.S.T. Mfg. Co. Ltd)

   Corresponding connector : SHLP-06V-S-B (J.S.T. Mfg. Co. Ltd)

Connector No.	Pin No.	symbol	function
CN2	1	VDD	+12V power supply
	2	VDD	+12V power supply
	3	GND	GND
	4	GND	GND
	5	XSTABY	Backlight ON/OFF signal
	6	VBR	PWM signal

5. Absolute Maximum Ratings

Parameter	Symbol	Condition	Pin	Ratings	Unit	Remark
Supply voltage	Vcc	Ta=25°C	VCC	−0.3 ～ +4.0	V	【*1,2】
	V_{DD}	Ta=25°C	VDD	−0.3 ～ +15.0	V	【*1,2】
Input voltage	V_{I1}	Ta=25°C	RxINi−/+ CK IN−/+	−0.3～Vcc+0.3	V	i=0,1,2
	V_{I2}	Ta=25°C	RL/UD,SELLVDS	−0.3～Vcc+0.3	V	
	V_{I4}	Ta=25°C	XSTABY, VBR	−0.3～+VDD	V	
Storage temperature	T_{STG}	—	–	−30 ～ +80	°C	【*1】
Operating temperature	T_{OPA}	—	–	−30 ～ +80	°C	【*1,3,4】

【*1】　Humidity：95%RH Max.(Ta≦40°C)　Note static electricity.

　　　　Maximum wet−bulb temperature at 39°C or less. (Ta>40°C)　No condensation.

【*2】　The VCC power supply capacity must use the one of 2A or more.

　　　　The VDD power supply capacity must use the one of 3A or more.　△1

　　　　There is a possibility of causing smoking and the ignition without fusion of LCD fuse　△2

　　　　when abnormality occurs when the current capacity is smaller than regulated values.

　　　　Please install the sprotection function in which the overcurrent and the excess voltage are controlled

　　　　to the set side when you design the lower current supply.

【*3】　There is a possibility of causing deterioration in the irregularity and others of the screen and the display

　　　　fineness though the liquid crystal module doesn't arrive at destruction when using it at　65～80°C.

　　　　There is a possibility of causing the fineness deterioration by the prolonged use in the (high temperature)

　　　　 humidity environment (60% or more).

【*4】　In the operating temperature item, the low temperature side is the ambient temperature regulations.

　　　　The high temperature side is the panel surface temperature regulations.

6. Electrical Characteristics

6-1. TFT-LCD panel driving

$T_a=+25°C$

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Supply voltage		V_{CC}		3.0	3.3	3.6	V	【*1】
Current dissipation		I_{CC}	Vcc=3.3V	—	270	350	mA	【*2】
Input voltage width for LVDS receiver		V_L		0	—	2.4	V	
Permissive input ripple voltage		V_{RP}		—	—	200	mV_{P-P}	Vcc=3.3V
Differential input	High	V_{TH}		—	—	$V_{CM}+100$	mV	$V_{CM}=+1.2V$
Threshold voltage	Low	V_{TL}		$V_{CM}-100$	—	—	mV	【*3】
Input voltage		V_{IH}		2.1	—	—	V	【*4】
		V_{IL}		—	—	0.8	V	
Input reak current		I_{OH}		—	—	400	μA	$V_{I2}=+3.3V$ 【*4】
		I_{OL}		−10	—	+10	μA	$V_{I2}=0V$ 【*4】
Terminal resistor		R_T		—	100	—	Ω	Differential input

【*1】 On-off conditions for supply voltage
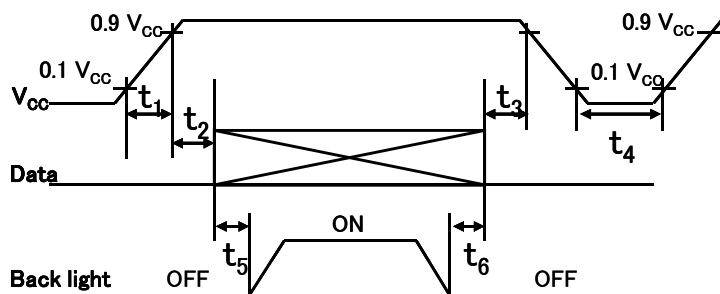
$20\mu s < t_1 \leqq 10ms$

$20ms < t_2 \leqq 200ms$

$0 < t_3 \leqq 1s$

$1s \leqq t_4$

$500ms \leqq t_5$

$200ms \leqq t_6$

Vcc-dip conditions
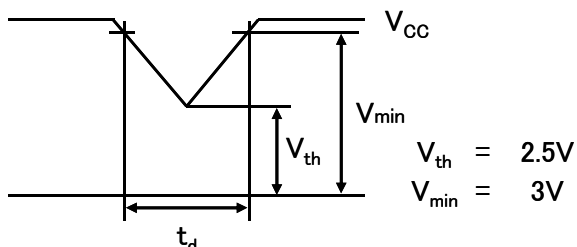
1) $Vth < V_{CC} \leqq Vmin$

$t_d \leqq 10ms$

2) $V_{CC} < V_{th}$

$V_{th} = 2.5V$

$V_{min} = 3V$

Vcc-dip conditions should also follow the On-off conditions for supply voltage

- Hsync/Vsync need not be input so that this model may drive only by the ENAB signal.
  Even if Hsync/Vsync is input, it doesn't become a malfunction.
- The relation between the data input and the backlight lighting will recommend the above-mentioned input sequence.
  When the backlight is turned on before the panel operates, there is a possibility of abnormally displaying.
  The liquid crystal module is not damaged.

【*2】 Current dissipation

Typical current situation : 64-gray-bar pattern

(Vcc=+3.3V、fck = 40MHz、Ta=25°C)

RGB RGB RGB ... RGB RGB
GS0 GS1 GS2   GS62 GS63
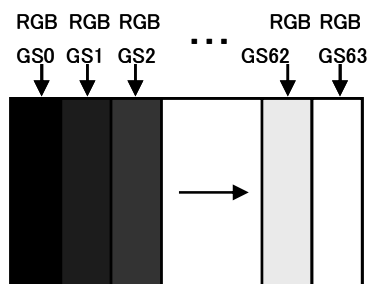
【*3】 V_{CM} : LVDS common mode voltage

【*4】 RL/UD

6-2. LED backlight

Ta＝+25℃

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark	
Supply voltage		V_{DD}	10.2	12.0	13.8	V	【*1】	
Current dissipation		I_{DD1}	–	350	500	mA	【*2】	
		I_{DD2}	–	–	10	μA		
Permissive input ripple voltage		V_{RP_BL}	–	–	200	mVP–P	VDD=+12.0V	
XSTABY	High voltage	V_{IH_BL1}	2.4	–	VDD	V	【*3】	
	Low voltage	V_{IL_BL1}	–	–	0.2	V	【*3】	
VBR	High voltage	V_{IH_BL2}	2.1	–	VDD	V	【*4】	
	Low voltage	V_{IL_BL2}	–	–	0.8	V	【*4】	
PWM	Frequency	f_{PWM}	200	–	1K	Hz	【*4,5】	
	Duty	D_{PWM}	10	–	100	%	【*4,5】	
	Pulse width (Lo)	L_{PWM}	–	–	4.5	ms	【*5,7】	△2
	Pulse width (Hi)	H_{PWM}	0.1	–	–	ms	【*5】	△2
Life time		L	–	(50,000) (Module)	–	h	【Reference】 【*6】	

【*1】 On-off conditions for supply voltage
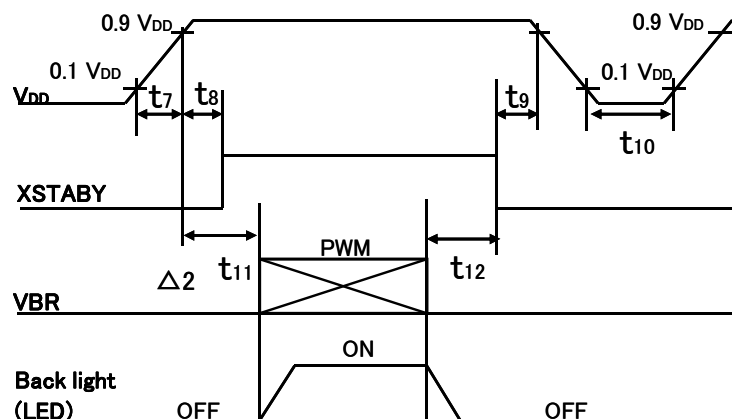
$20\mu s \leqq t7 \leqq 200ms$

$0ms \leqq t8$

$0ms \leqq t9$

$200ms \leqq t10$

$0ms \leqq t11$ △2

$0ms \leqq t12$

【*2】 Current dissipation

Typ. value： VDD=+12.0V、Duty=100%

Max. value： VDD=+10.2V、Duty=100%

【*3】 Backlight ON/OFF signal （connected by the pull-down resistor of 10kΩ）

【*4】 PWM signal （connected by the pull-down resistor of 10kΩ）
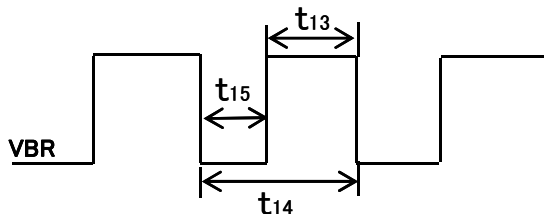
【*5】PWM

$f_{PWM} = 1/t_{14}$ $D_{PWM} = t_{13} / t_{14}$

Duty 10% : Min. Luminance(0%:LED OFF)

Duty 100% : Max. Luminance

Luminance changes in proportion to the duty ratio. $(t_{13} \geqq 10\mu s)$
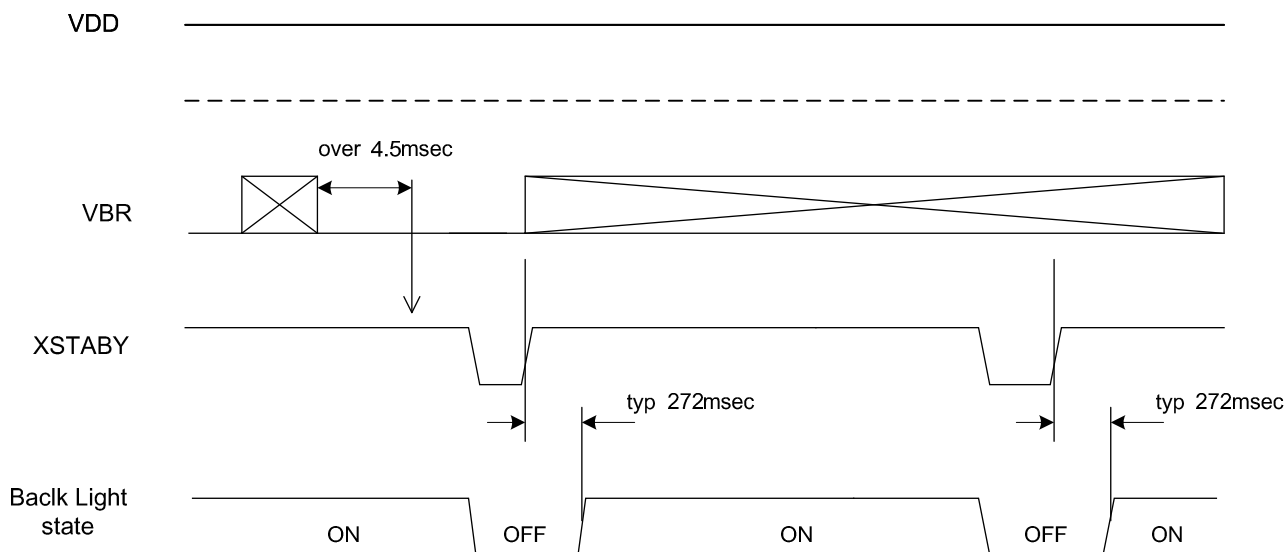
When the frequency slows, the display fineness might decrease.

【*6】Luminance becomes 50% of an initial value. (Ta＝25°C, PWM=100%)

【*7】When VBR signal is set "Low" more than 4.5ms, please turn off XSTABY.

△2

7. Timing characteristics of input signals

7-1. Timing characteristics

Parameter		Symbol	min	typ	max	unit	remark
Clock	Frequency	1/Tc	35	40	42	MHz	
ENAB	Horizontal period	TH	940	1056	1395	clock	
			23.5	26.4	39.9	μs	
	Horizontal period (High)	THd	800	800	800	clock	
	Vertical Frequency	TV	628	666	798	line	【*1】
			–	16.7	–	ms	
	Vertical period (High)	TVd	600	600	600	line	

【*1】 In case of using the long vertical period, the deterioration of display quality, flicker etc. may occur.
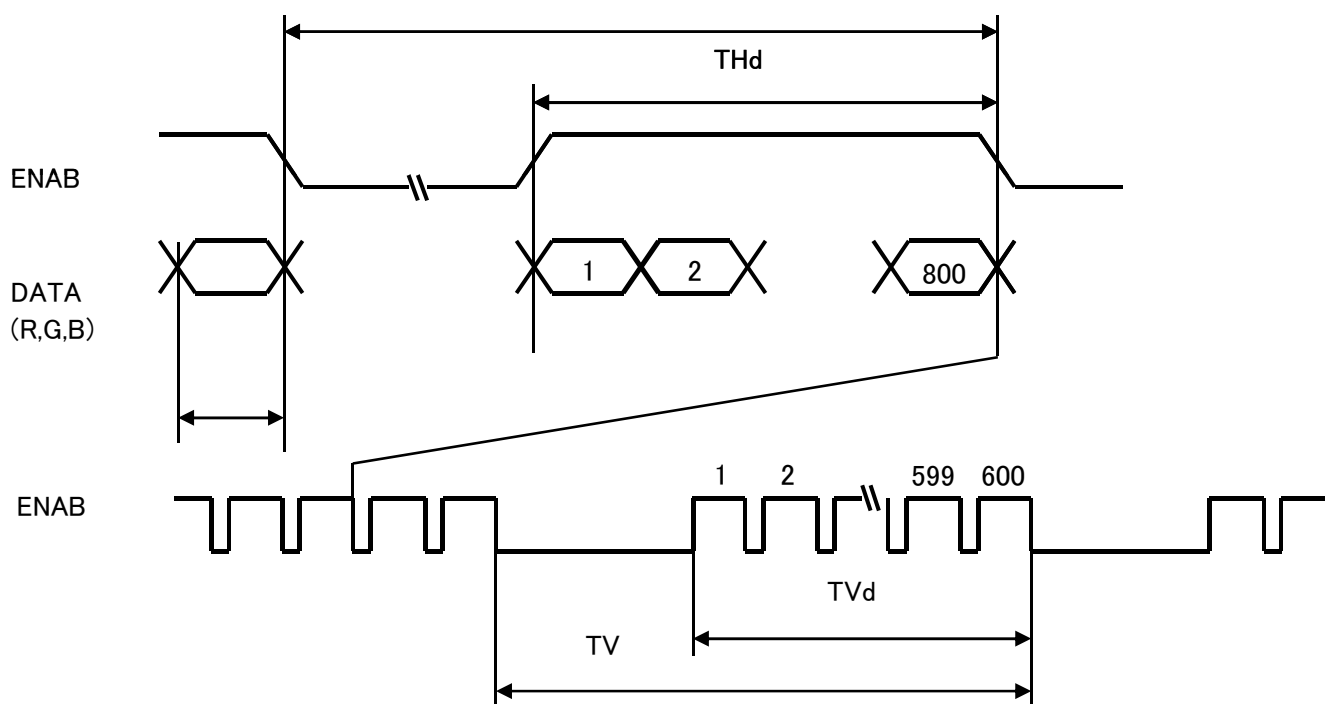
7-2. Input Data Signals and Display Position on the screen

R	G	B	R	G	B
(1, 1)			(2, 1)		

D(1,1) D(2,1) D(3,1)   D(800   ,1)

D(1,2) D(2,2)

D(1,3)

R G B

D(1,   600   )   D(800 , 600)
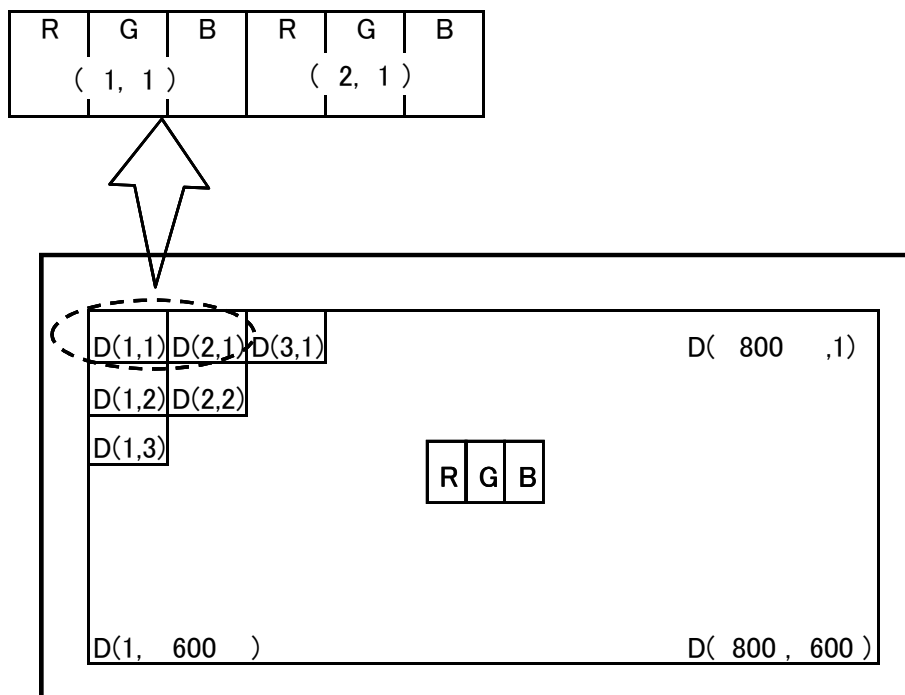
8. Input Signals, Basic Display Colors and Gray Scale of Each Color

	Colors & Gray scale	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

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℃, Vcc=＋3.3V

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angle range	Horizontal	$\theta 21, \theta 22$	CR>10	60	80	–	Deg.	【*1,2,4】
	Vertical	$\theta 11$		35	60	–	Deg.	
		$\theta 12$		60	80	–	Deg.	
Contrast ratio		CR	optimized angle	500	800	–		【*2,4】
Response Time	White Black	$\tau r + \tau d$		–	30	–	ms	【*3,4】
Chromaticity of White		Wx		0.255	0.305	0.355		【*4】
		Wy		0.275	0.325	0.375		
Chromaticity of Red		Rx		–	0.560	–		
		Ry		–	0.330	–		
Chromaticity of Green		Gx	$\theta = 0°$	–	0.335	–		
		Gy		–	0.595	–		
Chromaticity of Blue		Bx		–	0.155	–		
		By		–	0.115	–		
Luminance of white		Y_{L1}		350	450	–	cd/m^2	【*4】
White Uniformity				–	–	1.33		【*5】

※The measurement shall be executed 30 minutes after lighting at rating.

The optical characteristics shall be measured in a dark room or equivalent state with the method shown
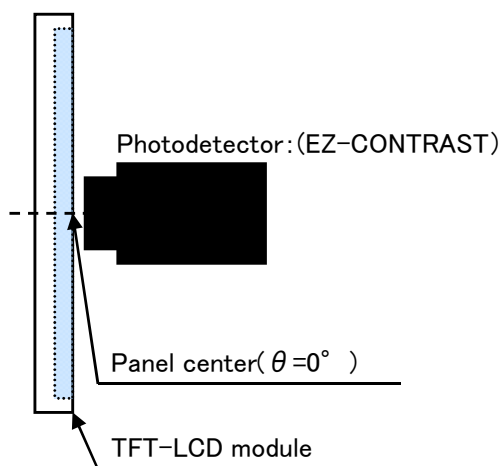
in Fig.2 below.

Photodetector:(EZ-CONTRAST)

Panel center(θ =0°)

TFT-LCD module

fig.2-1 Measuring method of Viewing angle range.

Photodetector
:Response time（BM-5A）
:Contrast/Luminance/Chromaticity（SR-3）

400mm

Field=1°
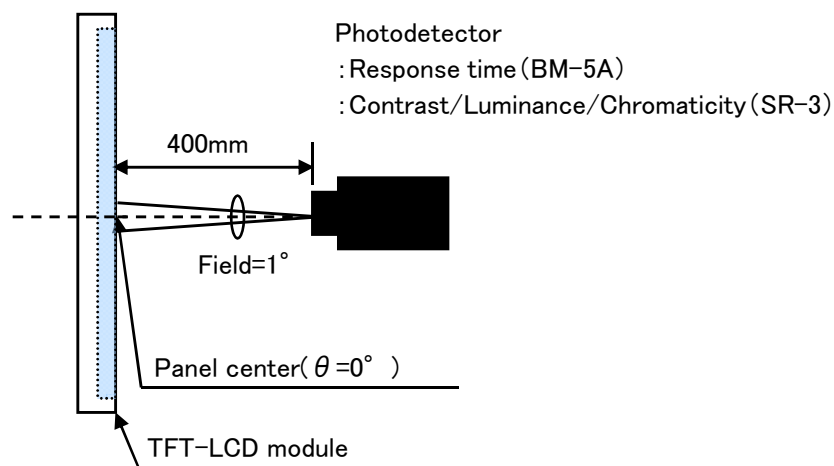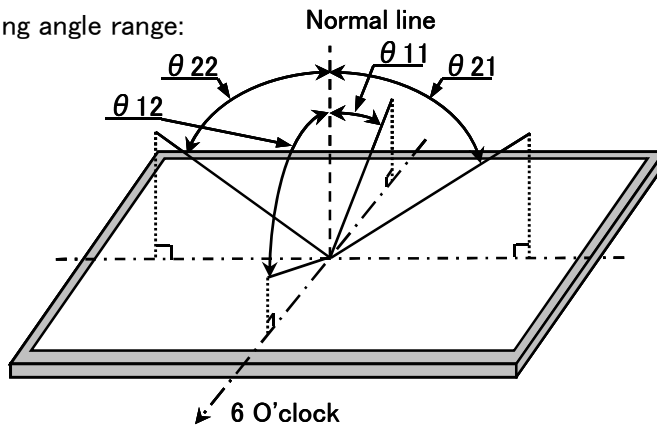
Panel center(θ =0°)

TFT-LCD module

fig.2-2 Measuring method of contrast, luminance, response time, and Chromaticity.

Fig.2 Optical characteristics measurement method

【*1】Definitions of viewing angle range:

Normal line

$\theta 22$ $\theta 12$ $\theta 11$ $\theta 21$

6 O'clock

【*2】Definition of contrast ratio:

The contrast ratio is defined as the following.   Contrast（CR）＝ $\dfrac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$

【*3】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".

Photodetector Output (Relative Value)

White   Black   White
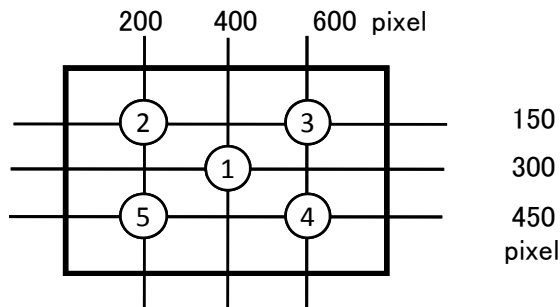
100%
90%

10%
0%

τ_d τ_r

Time
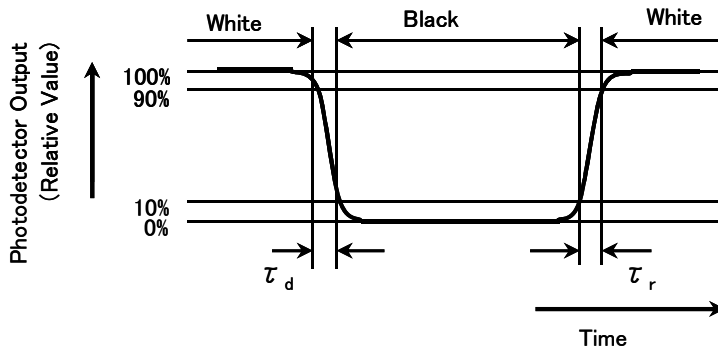
【*4】This shall be measured at center of the screen.

【*5】Definition of white uniformity:

White uniformity is defined as the following with five measurements. (①～⑤)

$\delta_w = \dfrac{\text{Maximum luminance of 5 points(①～⑤).}}{\text{Maximum luminance of 5 points(①～⑤).}}$

200   400   600 pixel

② ③ ① ⑤ ④

150
300
450
pixel

10. Handling Precautions

【Handling Precautions】

a) Treat LCD module in dustless surroundings. Metal foreign material stuck to the circuit is possible to cause a short.

b) Be sure to design the cabinet so that the module can be installed without any extra stress such as warp or twist.

c) Be careful not to give any physical stress onto the circuit and/or the connector of LCD module
when you pull/plug a cable. Physical stress will cause a break or worse connection.

d) Since the front polarizer is easily damaged, pay attention not to scratch it.

e) Use N2-blower such as an ionized nitrogen has anti-electrostatic when you blow dusts on Polarizer.

f) Since a long contact with water may cause discoloration or spots, wipe it with absorbent cotton or other soft
cloth immediately.

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) Be careful with the edge parts of the module which is made of metal.

i) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface. Handle with care.

j) When the panel is broken, don't touch the glass. Although the panel is difficult to be scattered, touching the
broken part may hurt your hands.

k) 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.

l) Don't touch the circuit and the pattern of the board. If you touch it, the circuit may be broken.

m) Follow the regulations when LCD module is scrapped. The government you stay may have some regulations
about it.

【Set-Design Precautions】

a) Notice : Never take to pieces the module , because it will cause failure. Please don't remove the fixed tape,
insulating tape etc. that was pasted on the original module. (except for protection film of the panel)

b) Protection 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. Blow off 'dust' on the polarizer by using
an ionized nitrogen.

c) Be sure to design the cabinet so that the module can be installed without any extra stress such as warp or twist.

d) Connect GND to flame of module to stabilize against EMI and external noise.

e) When install LCD modules in the cabinet, please tighten with("torque=0.294±0.02N·m(3.0±0.2kgf·cm)").
Be sure to confirm it in the same condition as it is installed in your instrument.

f) Since there is a circuit board in the module back, stress is not added at the time of a design assembly.
Please make it like. If stress is added, there is a possibility that circuit parts may be damaged.

g) It causes an irregular display and the defective indication, etc., when always put constant pressure
on the back of the module. Please do not make the structure to press the back of the module.

h) Be careful of a back light FPC not to pull by force at the time of the connecting to a W-LED driver,
or FPC processing.

i)   The polarizer surface on the panel is treated with Anti-Glare for low reflection. In case of attaching
      sure

j)   Don't change the volume of LCD module. It is optimized when the shipping. Any change may not meet
      the specification.

k)   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.

l)   Be sure to follow the absolute maximum rating in the specification. The design should consider the surrounding
      temperature, the fluctuating input signal, and tolerance of the electronic parts. Exceeding values is possible to
      cause worse characteristic such as burn and/or broken of the parts on LCD module.

m) Be sure to use LCD module within the recommended operating conditions. Operating module out of the
      recommended range is not guaranteed even if it is in the absolute maximum rating.

n)   Follow the power, signal, and supply voltage sequence which the specification indicates, regarding on-off
      input signal after power on of LCD module.

o)   According to the using application, power circuit protection is recommended at module failure.

【Operation Precautions】

a) Do not expose the LCD panel to direct sunlight. Lightproof shade etc. should be attached when LCD panel is used
      under such environment.

b) When handling LCD modules and assembling them into cabinets, please avoid that long-terms 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 modules.
      Do not use the LCD module under such environment.

c) An abnormal display by changing in quality of the polarizing plate might occur regardless of contact or no contact
      to the polarizing plate, because of epoxy resin (amine system curing agent) that comes out from the material
      and the packaging material used for the set side, the silicon adhesive (dealcoholization system and oxime system),
      and the tray blowing agents (azo-compound), etc. Please confirm adaptability with your employed material.

d) Don't use polychloroprene (CR) with LCD module. It will generate chlorine gas, which will damage the reliability of
      the connection part on LCD panel.

e) Be careful when using it for long time with fixed pattern display as it may cause accidential image.
      Pleave use a screen saver etc., in order to avoid an afterimage.

f) The LED (Light Emitting Diode) used in this LCD module is very sensitive to temperature change. If it operates
      for extremely long time under high temperature, it is possible rapidly to shorten the life time of LED.
      In case of such a condition, consult with us.

g)   If stored at the temperatures lower than the rated storage temperature, the LC may freeze and it may cause
      LCD panel damage. If storage temperature exceeds the specified rating, the molecular orientation of the LC may
      change to that of a liquid, and they may not revert to their original state. Store the module in normal room
      temperature.

h)   Keep LCD module in the range of the specified temperature conditions at all times. Once out of the range,
      liquid crystal will lose its characteristics, and it cannot recover.

i)   Nature of dew consideration prevention is necessary when LCD is used for long time under high-temperatur
      and high-humidity.

11. Packing form

    a) Piling number of cartons ：   MAX. 6

    b) Package quantity in one carton：   20pcs

    c) Carton size(TYP)：   517mm(W) × 432mm(D)×347mm(H)

    d) Total mass of one carton filled with full modules(20pcs)： 14kg

12. Reliability test items

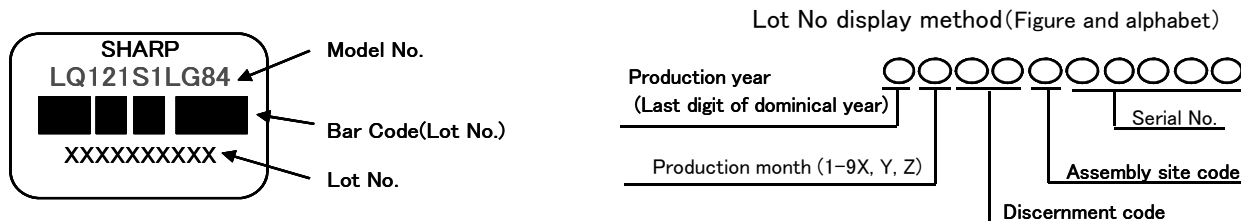|	No.	Test item	Conditions	Remark
	1	High temperature storage test	Ambient temperature 80℃ 240H	【Note1】
	2	Low temperature strage test	Ambient temperature −30℃ 240H	【Note1】
	3	High temperature & high humidity operation test	Ambient temperature 40℃、Humidity 95% RH 240H（No condensation.）	【Note1】
	4	High temperature operation test	Panel surface 80℃ 240H	【Note1】
	5	Low temperature operation test	Ambient temperature −30℃ 240H	【Note1】

△1	6	Vibration test (non-operating)	＜Sin wave＞
			  Frequency ：10～57Hz／Vibration width (one side) ：0.076mm
			                ：57～500Hz／Gravity：9.8m/s2
			  Sweep time：11minutes
			  Test period ：3H(X, Y, Z direction 1H)
				【Note1】

△1	7	Shock test (non-operating)	Max. gravity：490m/s2 Pulse width：11ms Direction：±X,±Y,±Z Test period ：1time／1direction	【Note1】
	8	Thermal shock test	−30℃[0.5h]～80℃[0.5h]／50cycles	【Note1】

【Note1】 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)
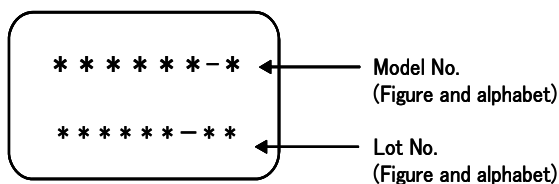
13. Others

13-1. Lot No Label:

A）Module serial label

The label that displays SHARP・Model No.（ LQ121S1LG84）・Lot No. is stuck on the back of the module.

Lot No display method（Figure and alphabet）

```
SHARP          → Model No.
LQ121S1LG84
■■■■           → Bar Code(Lot No.)
XXXXXXXXXX     → Lot No.
```

Production year
(Last digit of dominical year)

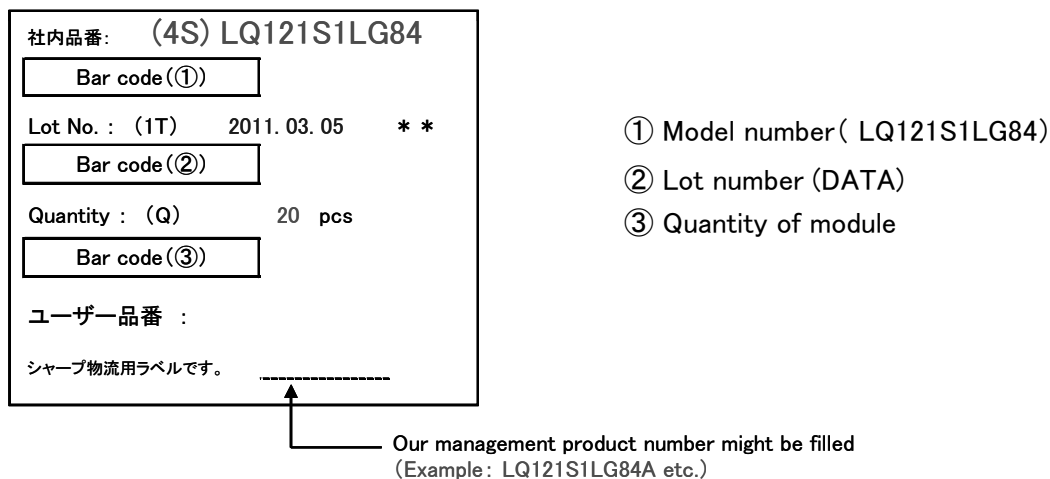Production month (1–9X, Y, Z)

Serial No.

Assembly site code

Discernment code

B）Backlight serial label

The label that displays the model No. and lot No. for the backlight is stuck on the back of the module.

```
＊＊＊＊＊＊-＊    ← Model No.
                (Figure and alphabet)

＊＊＊＊＊＊－＊＊   ← Lot No.
                (Figure and alphabet)
```

13-2. Packing box Label:

The label that displays ①Model number（ LQ121S1LG84) ②Lot number ③Quantity of module is stuck

on the packing box. Moreover, the display of bar code also applies to this.

```
社内品番：  (4S) LQ121S1LG84
    Bar code(①)

Lot No. :  (1T)   2011. 03. 05    ＊＊
    Bar code(②)

Quantity :  (Q)      20  pcs
    Bar code(③)

ユーザー品番 ：

シャープ物流用ラベルです。 _____
```

① Model number（ LQ121S1LG84）

② Lot number（DATA）

③ Quantity of module

Our management product number might be filled
（Example： LQ121S1LG84A etc.）

A right picture is written to the packing box of module for the RoHS restriction.

  ※ R.C.（RoHs Compliance）means these parts have corresponded with the RoHs directive.

  This module corresponds from the first sample to RoHS Directive.

R.C.

The figure below is written under the SHARP logo of the packing box about the production country.

MADE IN JAPAN   OR   MADE IN CHINA

13-3. The ozone-depleting substances is not used.

13-4. If any problem occurs in relation to the description of this specification , it shall be resolved through

discussion with spirit of cooperation.

14. Storage conditions

Environmental condition range of storage temperature and humidity

Temperature   0 to 40 degrees Celsius

Relative humidity   95% and below

【Note】Please refer below as a mean value of the environmental conditions.

Summer time temperature 20 to 35 degrees Celsius humidity , 85% and below

Winter time temperature 5 to 15 degrees Celsius humidity , 85% and below

Please maintain within 240 hours of accumulated length of storage time, with conditions of 40 degrees Celsius and room humidity of 95%.

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.
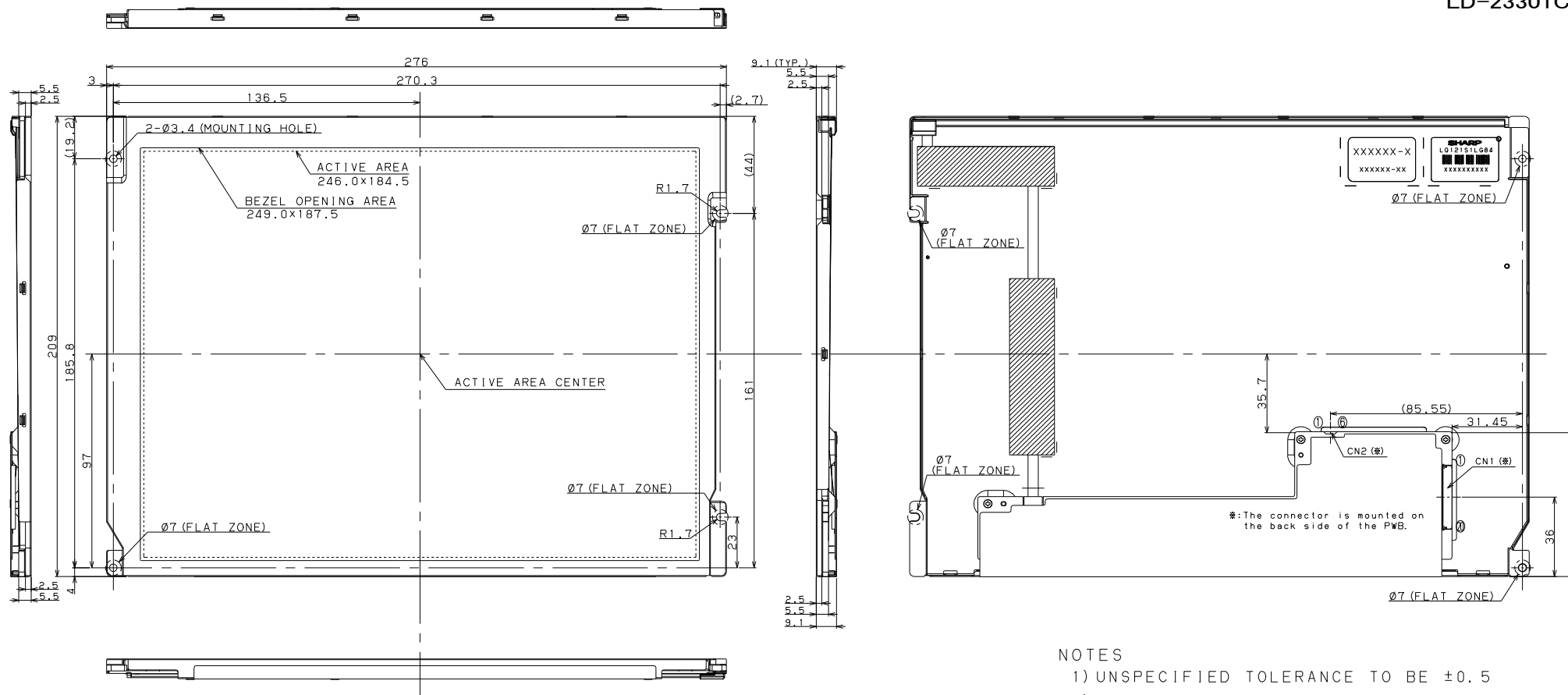
Prevention of dew

Please store the product carton either on a wooden pallet or a stand / rack 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 storage wall.

Storage period

Within above mentioned conditions, maximum storage period should be one year.

276
270.3
136.5
9.1(TYP.)
5.5
2.5
(2.7)

2-Ø3.4 (MOUNTING HOLE)

ACTIVE AREA
246.0×184.5

BEZEL OPENING AREA
249.0×187.5

R1.7
Ø7 (FLAT ZONE)

ACTIVE AREA CENTER

Ø7 (FLAT ZONE)

Ø7 (FLAT ZONE)

R1.7

Ø7 (FLAT ZONE)

XXXXXX-X
LQ121S1LG84
xxxxxx-xx XXXXXXXXX

Ø7 (FLAT ZONE)

Ø7
(FLAT ZONE)

35.7

(85.55)
31.45

CN2 (※)

CN1 (※)

Ø7
(FLAT ZONE)

65.3

36

※:The connector is mounted on
the back side of the PWB.

Ø7 (FLAT ZONE)

NOTES
1) UNSPECIFIED TOLERANCE TO BE ±0.5
2) WARP AND FLOATING FOR PWB COVER・FFC・CHASSIS
   ARE EXCLUDED FROM THE THICKNESS OF THE UNIT.
3) TIGHTEN TORQUE (RECOMMENDATION)
   :0.294±0.02N・m (3.0±0.2kgf・cm)
   ※PLASE CONFIRM WHETHER THERE IS
   THE PROBLEM SUCH AS LOOSENING OF
   THE SCREW IN A REAL MACHINE.
4) NEVER TAKE TO PIECES THE MODULE,
   BECAUSE IT WILL CAUSE FAILURE.
   PLEASE DO NOT PELL OFF THE PWB COVER,
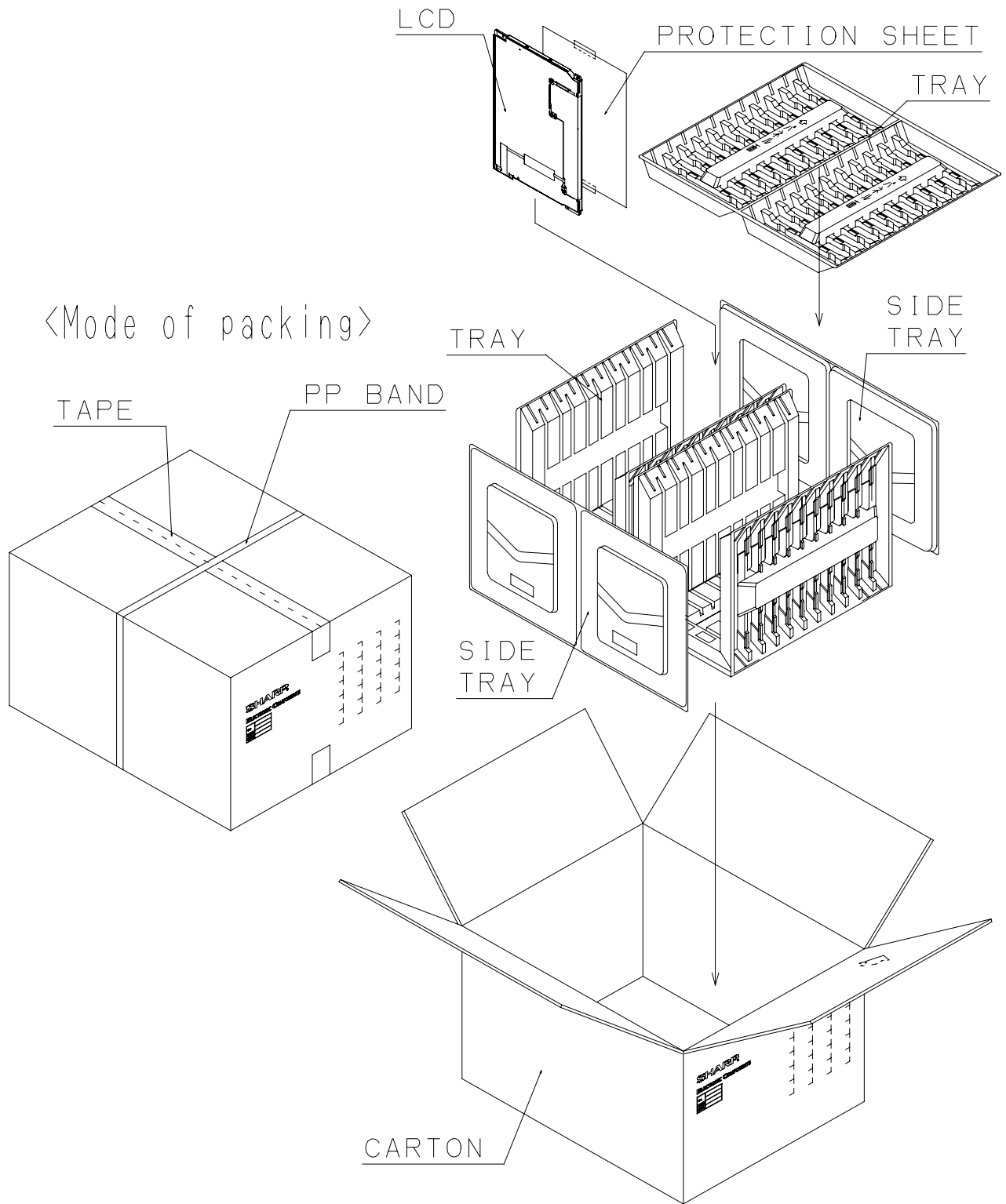   SCREW, TAPE PASTED TO THE PRODUCT.

【I/F Connector】
CN1:FI-SEB20P(JAE)

PIN LAYOUT

1	2	3	4	5	6	7	8
VCC	VCC	GND	GND	RXIN0-	RXIN0+	GND	RXIN1-
9	10	11	12	13	14	15	16
RXIN1+	GND	RXIN2-	RXIN2+	GND	CKIN-	CKIN+	GND
17	18	19	20				
NC	RL/UD	GND	GND				

BEZEL/DISPLAY POSITION

A

ACTIVE AREA

BEZEL OPENING

C B D

1) TOLERANCE X-DIRECTION A:1.5±0.8
2) TOLERANCE Y-DIRECTION B:1.5±0.8
3) OBLIQUITY OF DISPLAY AREA IC-DI<0.8

【LED Backlight Connector】
CN2:SM06B-SHLS-TF(JST)

PIN LAYOUT

1	2	3	4	5	6
VDD	VDD	GND	GND	XSTABY	VBR

Fig.1 : LQ121S1LG84 OUTLINE

LCD

PROTECTION SHEET

TRAY

〈Mode of packing〉

TRAY

SIDE TRAY

TAPE

PP BAND

SIDE TRAY

CARTON

Fig 3 : PACKING FORM