Technical Document

LCD Specification

LCD Group

LQ104V1DG62 LCD Module

Product Specification
February 2008

VGA LCD Module featuring 550 nits brightness with 600:1 contrast and extended temperature operation. LED backlight is rated at 50,000 hours. Full Specifications Listing.

SHARP

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	MOBILE LIQUID CRYSTAL DISPLAY GROUP SHARP CORPORATION SPECIFICATION	APPLICABLE GROUP MOBILE LIQUID CRYSTAL DISPLAY GROUP

DEVICE SPECIFICATION FOR

TFT-LCD Module

MODEL No.

LQ104V1DG62

These parts have corresponded with the RoHS directive.

☐ CUSTOMER'S APPROVAL

BY

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1. Application

This specification applies to color 10.4VGA TFT-LCD module, LQ104V1DG62.

The device listed in these technical literature sheets 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 (conrrols 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 these specification sheets.

Confirm "12. Handling Precautions " item when you use the device.

Contact and consult with a SHARP sales representative for any questions about this device.

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 White-LED 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, +3.3V/5.0V 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. Viewing angle is 6 o’clock direction.
This module is the type of wide viewing angle, superhigh brightness (550cd/m^2) and high contrast (600:1).
The LED Backlight driving DC/DC converter and the cable are not built in this LCD module.

3. Outline specification.

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)	-
Number of colors (Number of gray scale level)	262, 144 colors (64 gray scales per color)	
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)×Max.12.5(D)	mm
Mass	580(max)	g
Surface treatment	Anti-glare and hard-coating 3H	-

*1: Note: excluding back light cables (The backlight cable is not attached to the LCD unit.)

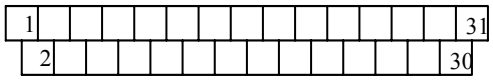
The thickness of module (D) doesn't contain the projection.

Outline dimensions is shown in Fig.1

4. Input Terminals

4-1. TFT-LCD panel driving

CN1 Used connector: DF9MA-31P-1V(32) (Hirose Electric Co., Ltd.)



CN1 pin arrangement from module surface
(Transparent view)

Corresponding connector:
DF9-31S-1V(32), DF9A-31S-1V(32),
DF9B-31S-1V(32), DF9C-31S-1V(32)
(Hirose Electric Co., Ltd.)

(※) Please do not use it besides corresponding conector

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	+3.3V / +5.0V power supply	
29	Vcc	+3.3V / +5.0V power supply	
30	R/L	Horizontal display mode select signal	[Note3]
31	U/D	Vertical display mode select signal	[Note4]

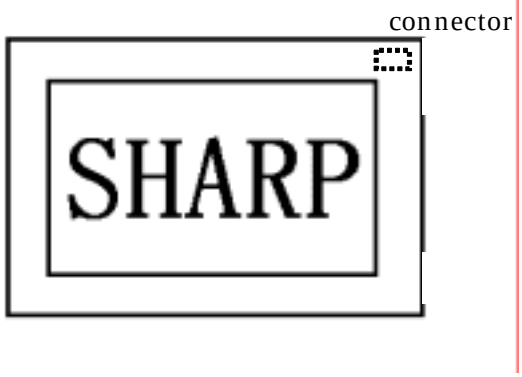
※The shielding case is connected with GND.

[Note1] The polarity of both synchronous signals are negative.

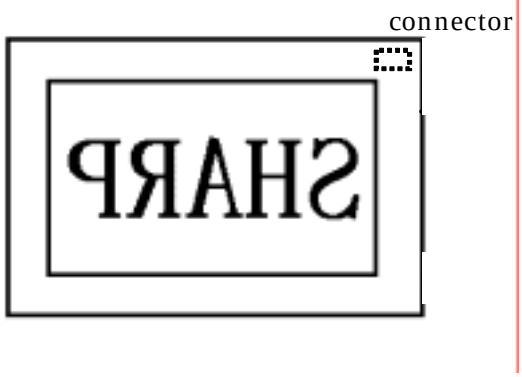
[Note2] The horizontal display start timing is settled in accordance with a rising timing of ENAB signal. In case ENAB is fixed "Low", the horizontal start timing is determined as described in 8-2. Don't keep ENAB “High" during operation.

[Note 3],[Note 4]

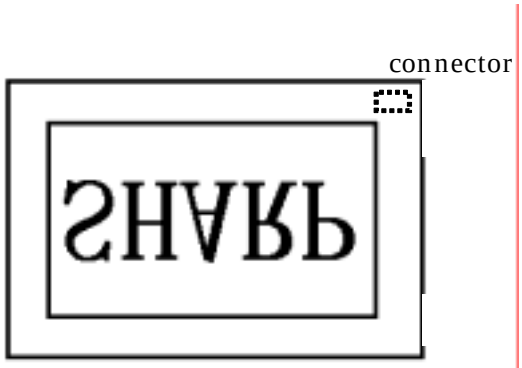
R/L = High, U/D = Low



R/L = Low, U/D = Low



R/L = High, U/D = High



R/L = Low, U/D = High

4-2. Backlight driving

CN2 Used connector : SM06B-SRSS-TB(LF)(SN) (JST)

Corresponding connector : SHR-06V-S-B (JST)

Pin no.	symbol	function
1	+ch3	Power supply for LED (Ch3 High voltage side)
2	+ch2	Power supply for LED (Ch2 High voltage side)
3	+ch1	Power supply for LED (Ch1 High voltage side)
4	- ch1	Power supply for LED (Ch1 Low voltage side)
5	- ch2	Power supply for LED (Ch2 Low voltage side)
6	- ch3	Power supply for LED (Ch3 Low voltage side)

5. Absolute Maximum Ratings

Parameter	Symbol	Condition	Ratings	Unit	Remark
Input voltage	VI	Ta=25°C	-0.3 to Vcc+0.3	V	[Note1]
Lamp input current	IL	-	350	mA	
supply voltage	Vcc	Ta=25°C	0 to +6.0	V	
Storage temperature	Tstg	-	-30 to +80	°C	[Note2]
Operating temperature	Topa	Panel surface	-30 to +80	°C	

[Note1] CK,R0～R5,G0～G5,B0～B5,Hsync,Vsync,ENAB,R/L,U/D

[Note2] Humidity: 95%RH Max. at Ta≦40°C.

Maximum wet-bulb temperature at 39°C or less at Ta>40°C.

No condensation.

6. Recommended operation condition

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Input voltage	V_I	0		Vcc	V	[Note1]
Supply voltage	V_{CC}	＋3.0	+3.3/+5.0	＋5.5	V	[Note2]
Ambient temperature	Topa	-30		+80	℃	[Note3], [Note4]

[Note1]CK,R0～R5,G0～G5,B0～B5,Hsync,Vsync,ENAB,R/L,U/D

[Note2]

Vcc-turn-on conditions

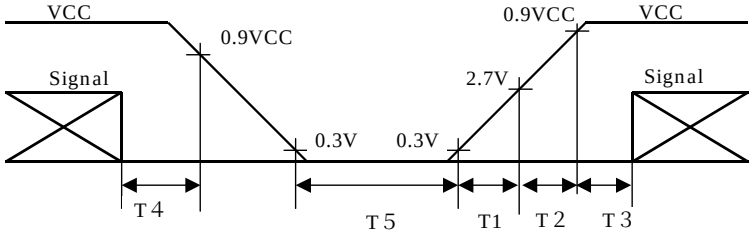
0<t1≦15ms

0<t2≦10ms

0<t3≦100ms

0<t4≦1s

t5>200ms



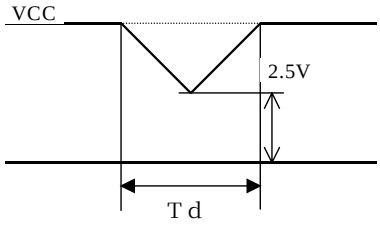
Vcc-dip conditions

1) 2.5V≦Vcc

td≦10ms

2) Vcc<2.5V

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



[Note3] Humidity: 95%RH Max. at Ta≦40 °C.

Maximum wet-bulb temperature at 39 °C or less at Ta>40 °C.

No condensation.

[Note4] Maximum value : Panel surface temperature

7. Electrical Characteristics

7-1. TFT-LCD panel driving Ta=25 °C

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Current dissipation	Vcc=3.3V	Icc	-	200	300	mA	[Note1]
	Vcc=5.0V	Icc	-	130	200	mA	
Permissive input ripple voltage		VRP	-	-	100	mVp-p	
Input voltage	Low	VIL	-	-	0.8	V	[Note2]
Input voltage	High	VIH	2.1	-	-	V	
Input current 1	Low(VI=0V)	IOL1	-10.0	-	10.0	μA	[Note3],[Note6]
	Hogh(VI=Vcc)	IOH1	-10.0	-	10.0	μA	
Input current 2	Low(VI=0V)	IOL2	-800	-	-	μA	[Note4],[Note6]
	Hogh(VI=Vcc)	IOH2	-10.0	-	10.0	μA	
Input current 3	Low(VI=0V)	IOL3	-10.0	-	10.0	μA	[Note5],[Note6]
	Hogh(VI=Vcc)	IOH3	-	-	800	μA	

[Note1] Typical current situation : 16-gray-bar pattern.
Vcc=+3.3V/+5.0V

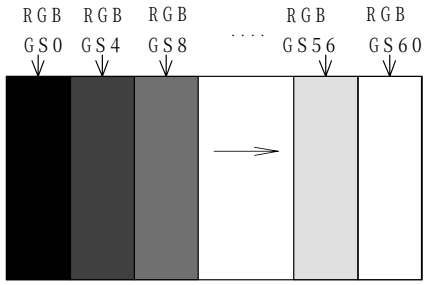
[Note2] CK,R0~R5,G0~G5,B0~B5,Hsync,Vsync,ENAB, R/L,U/D

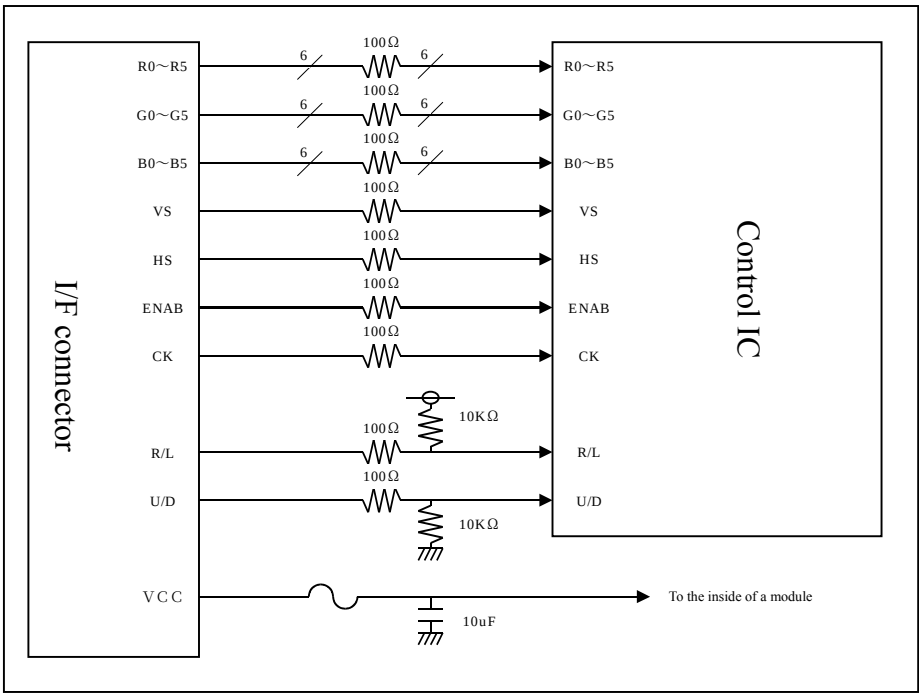
[Note3] CK,R0~R5,G0~G5,B0~B5,Hsync,Vsync,ENAB,

[Note4] R/L

[Note5] U/D

[Note6] See below block diagram of input interface.





7-2. Backlight driving

The backlight system is an edge-lighting type with white-LED.

The characteristics of LED are shown in the following table.

(It is usually required to measure under the following condition.

condition:Constant current drive,Ta=25℃±2℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED voltage	V_L	—	18.6	21.6	V	
LED current range	I_L	—	80	100	mArms	Value for one channel [Note 1]
Number of circuit channel		—	3	—		[Note 2]
Lamp power consumption	W_L	—	4.5	6.5	W	[Note 3]
Life time（LCD module）	L_L	50,000	—	—	Hour	[Note 4]

＊LED：NICHIA CORPORATION (NFSW-TYPE)

[Note 1] The LED current is recommended to be used by 80mA or less to suppress the LED deterioration.

[Note 2] The LED backlight is composed of 3 channels which 6 LED is connected in series.

[Note 3] Calculated value for reference ($I_L \times V_L \times 3$ channel)

[Note 4]①Lighting condition:

・The state of the LCD module installation: Landscape position and standing position

・Atmosphere temperature: 25℃

・Lighting current: 80mA (Constant current drive／Continuous turning on)

②Definition of Life time:

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

8. Timing Characteristics of input signals

Timing diagrams of input signal are shown in Fig.2.

8-1. Timing characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Clock	Frequency	1/Tc	23	25.18	28.33	MHz	-
	High time	Tch	5	-	-	ns	-
	Low time	Tcl	10	-	-	ns	-
	Duty ratio	Th/T	40	50	60	%	-
Data	Setup time	Tds	5	-	-	ns	-
	Hold time	Tdh	10	-	-	ns	-
Horizontal sync. signal	Cycle	TH	30.00	31.78	-	μs	-
			750	800	900	clock	-
	Pulse width	THp	2	96	200	clock	-
Vertical sync. signal	Cycle	TV	515	525	560	line	-
	Pulse width	TVp	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	-
Vertical data start position		TVs	34	34	34	line	-

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

8-2. 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	TH-10	clock	-
Hsync-Enable signal phase difference		THe	44	-	TH—664	clock	-

[Note] When ENAB is fixed "Low", the display starts from the data of C104(clock) as shown in Fig.2.

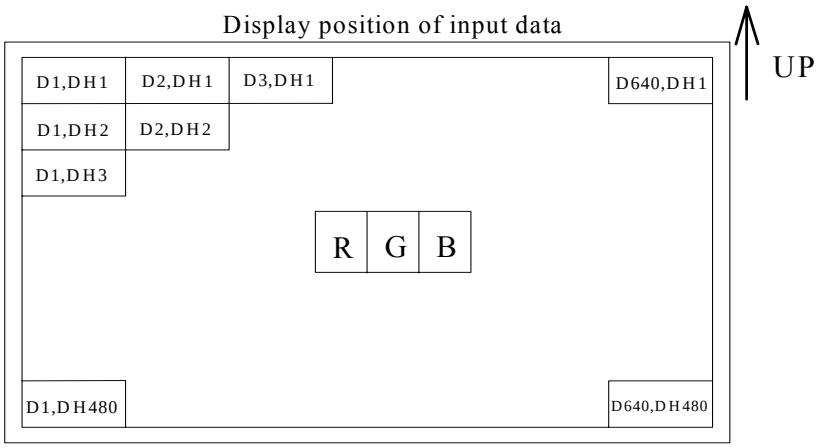
Be careful that the module does <u>not</u> work when ENAB is fixed "High".

When the phase difference is below 104 clock, keep the “High level of ENAB is signal longer than 104-THe. If it will not be keeped, the display starts from the data of C104(clock).

8-3. Vertical display position

The vertical display position, TVs is fixed “34” (line).

8-4. Input Data Signals and Display Position on the screen



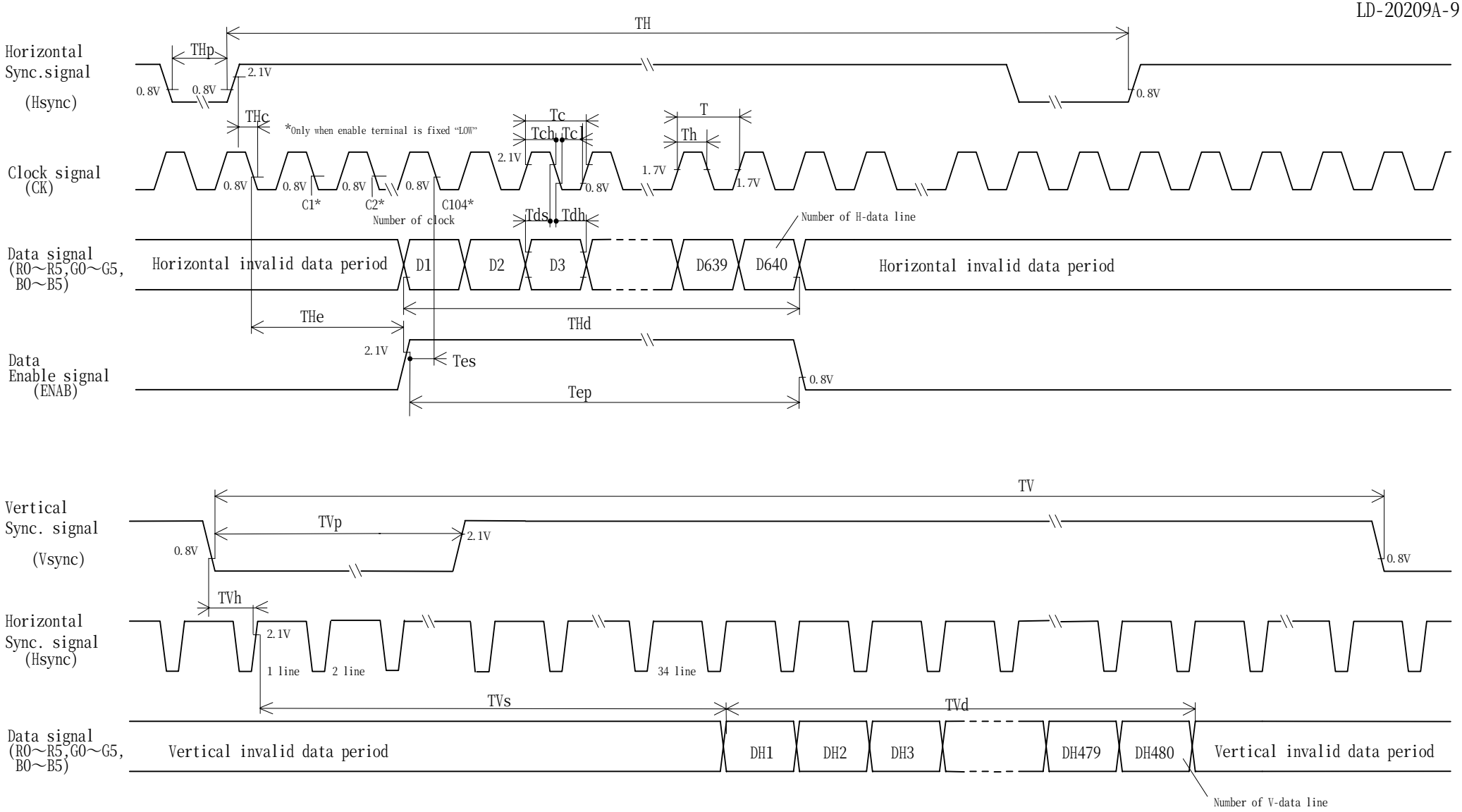


Fig. 2 Input signal waveforms

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

	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 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.

10. Optical Characteristics

Ta=25°C, Vcc=+3.3V / +5.0V

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angle range	Horizontal	θ21, θ22	CR>10	60	70	-	Deg.	[Note1] [Note4]
	Vertical	θ11		35	50	-	Deg.	
		θ12		55	60	-	Deg.	
Contrast ratio		CRn	θ=0°	300	-	-		[Note2] [Note4]
		CRo	Optimum viewing angle	-	600	-		
Response time	Rise	τr	θ=0°	-	10	-	ms	[Note3] [Note4]
	Decay	τd		-	25	-	ms	
Chromaticity of white		x		0.255	0.313	0.375		[Note4] If=80mA Ta=25°C
		y		0.288	0.343	0.410		
Chromaticity of red		x		0.520	0.569	0.620		
		y		0.279	0.327	0.375		
Chromaticity of green		x		0.287	0.339	0.390		
		y		0.507	0.562	0.619		
Chromaticity of blue		x		0.127	0.175	0.225		
		y		0.131	0.182	0.238		
Luminance of white		Y_{L1}		400	550	-	cd/m^2	
White Uniformity		δW		-	-	1.35		[Note5]

[Note] The measurement shall be executed 30 minutes after lighting at rating. (condition:If=80mA)

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

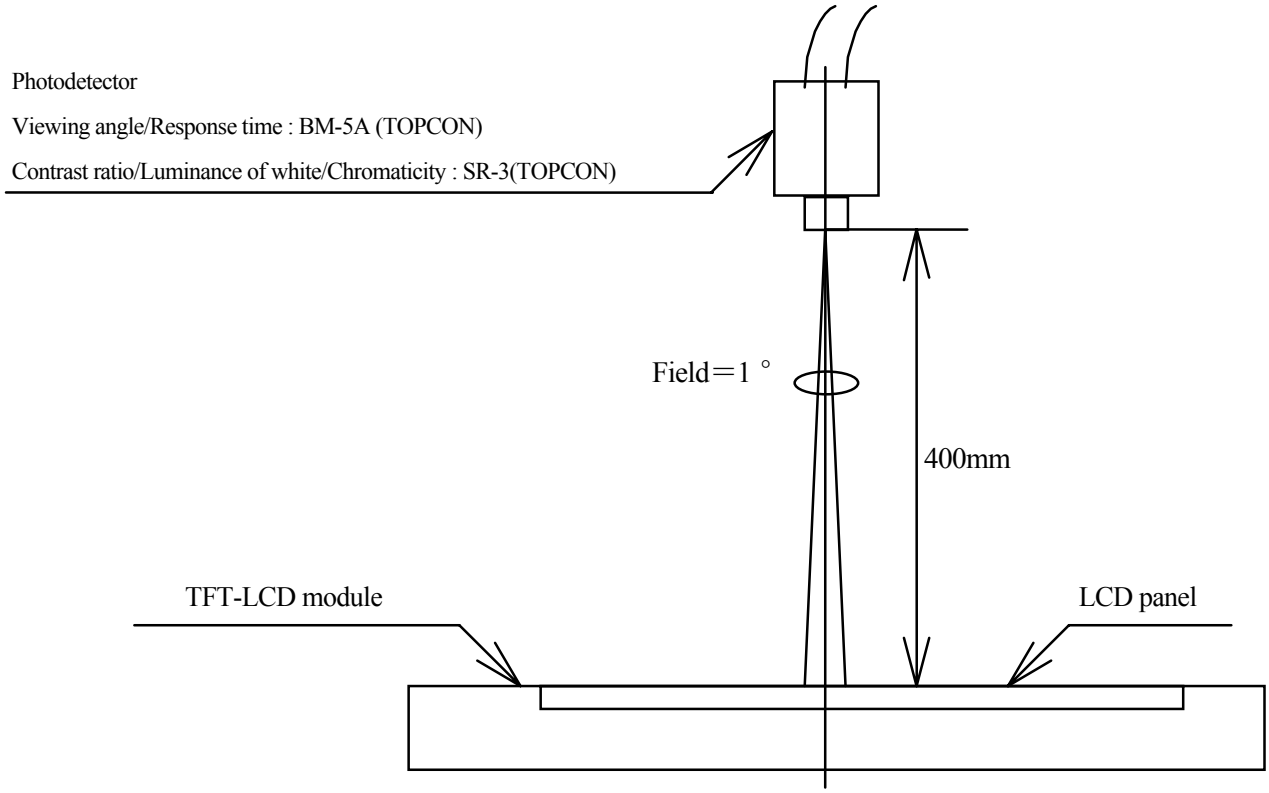
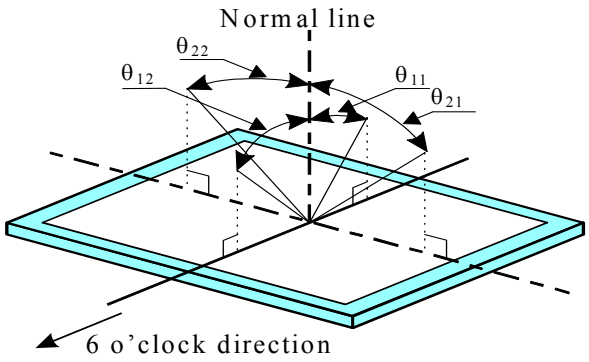


Fig.3 Optical characteristics measurement method

[Note1] Definitions of viewing angle range:



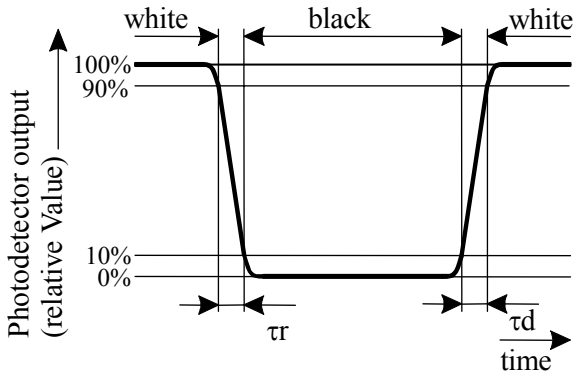
[Note2] Definition of contrast ratio:

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:

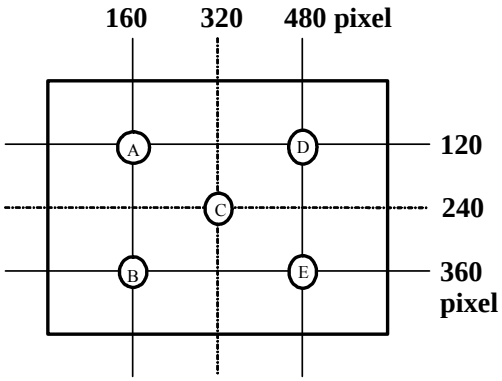
The response time is defined as the following figure and shall be measured by switching the input signal for "black" and "white" .



[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).



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

11. Display Quality

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

12.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.
Blow away dust on the polarizer with antistatic N_2 blow. It is undesirable to wipe off because a polarizer is sensitive.
It is recommended to peel off softly using the adhesive tape when soil or finger oil is stuck to the polarizer.
When unavoidable, wipe off carefully with a cloth for wiping lenses.

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) 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.

i) 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.

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 panel to direct sunlight. Lightproof shade etc. should be attached when LCD panel is used under such environment.

l) Connect GND to 4 place of mounting holes 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. Do not use the LCD module under such environment.

n) When install LCD modules in the cabinet, recommended torque value is “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.

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) Notice:Never dismantle the module , because it will cause failure.
Please do not peel off the white tape pasted to the product. However, the panel protection film is excluded.

q) Be careful when using it for long time with fixed pattern display as it may cause afterimage.

r) 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.

s) 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.

t) 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.

13. Packing form

Product countries / Areas	CHINA		
Piling number of cartons	6（max）		
Package quantity in one carton	10pcs		
Carton size	468×253×323(H)		
Total mass of one carton filled with full modules	7.5Kg(typ)		
Packing form is shown	Fig.4		

14.Reliability test items

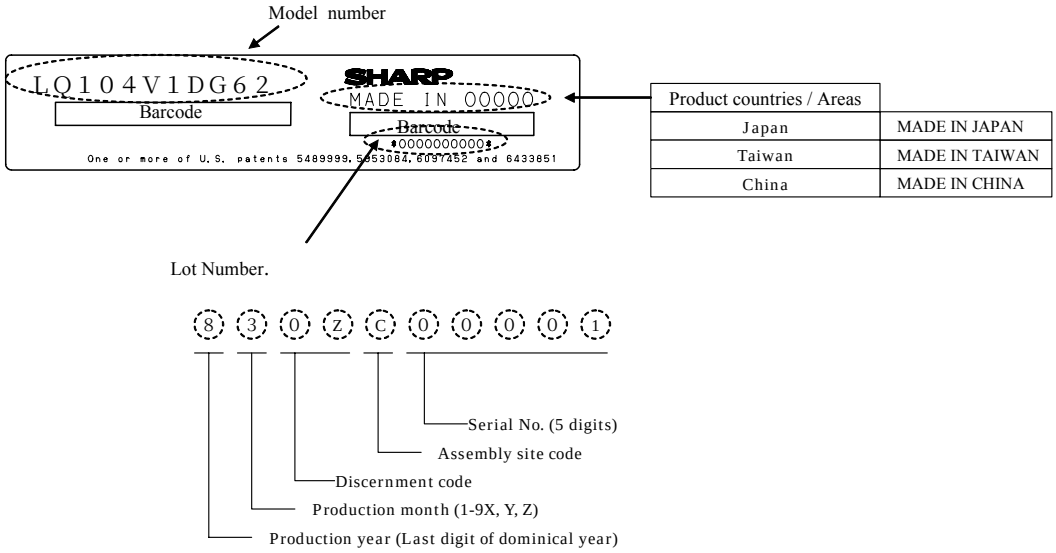
No.	Test item	Conditions	Remark
1	High temperature storage test	Tpa=80℃ 240h	Panel surface
2	Low temperature storage test	Ta= -30℃ 240h	
3	High temperature & high humidity operation test	Ta=40℃ ; 95%RH 240h (If=80mA) (No condensation)	
4	High temperature operation test	Tpa=80℃ 240h (If=80mA)	Panel surface
5	Low temperature operation test	Ta= -30℃ 240h (If=80mA)	
6	Vibration test (non- operating)	Frequency: 10～57Hz/Vibration width (one side): 0.115mm : 57～500Hz/Gravity: 19.6 m/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.	
8	ESD test	Contact discharge (150pF,330Ω) Non-operating =±10kV ,operating=±8kV Atmospheric discharge (150pF,330Ω) Non-operating =±20kV ,operating=±15kV	
9	EMI	Measurement in 10m site Display position on the screen=”H”(full-screen) GND to 4 place=un-connect Vcc/Vsignal=typ	VCCI (Class B)

[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)

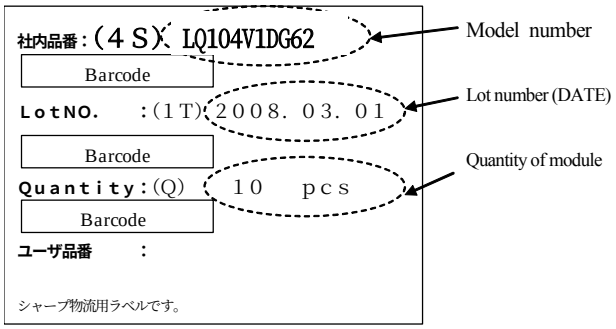
15.Others

15-1 Lot No. Label:



Product countries / Areas	
Japan	MADE IN JAPAN
Taiwan	MADE IN TAIWAN
China	MADE IN CHINA

15-2 Packing box Label:



R.C.

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

15-3 If any problem occurs in relation to the description of this specification, it shall be resolved through discussion with spirit of cooperation.

16. 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.

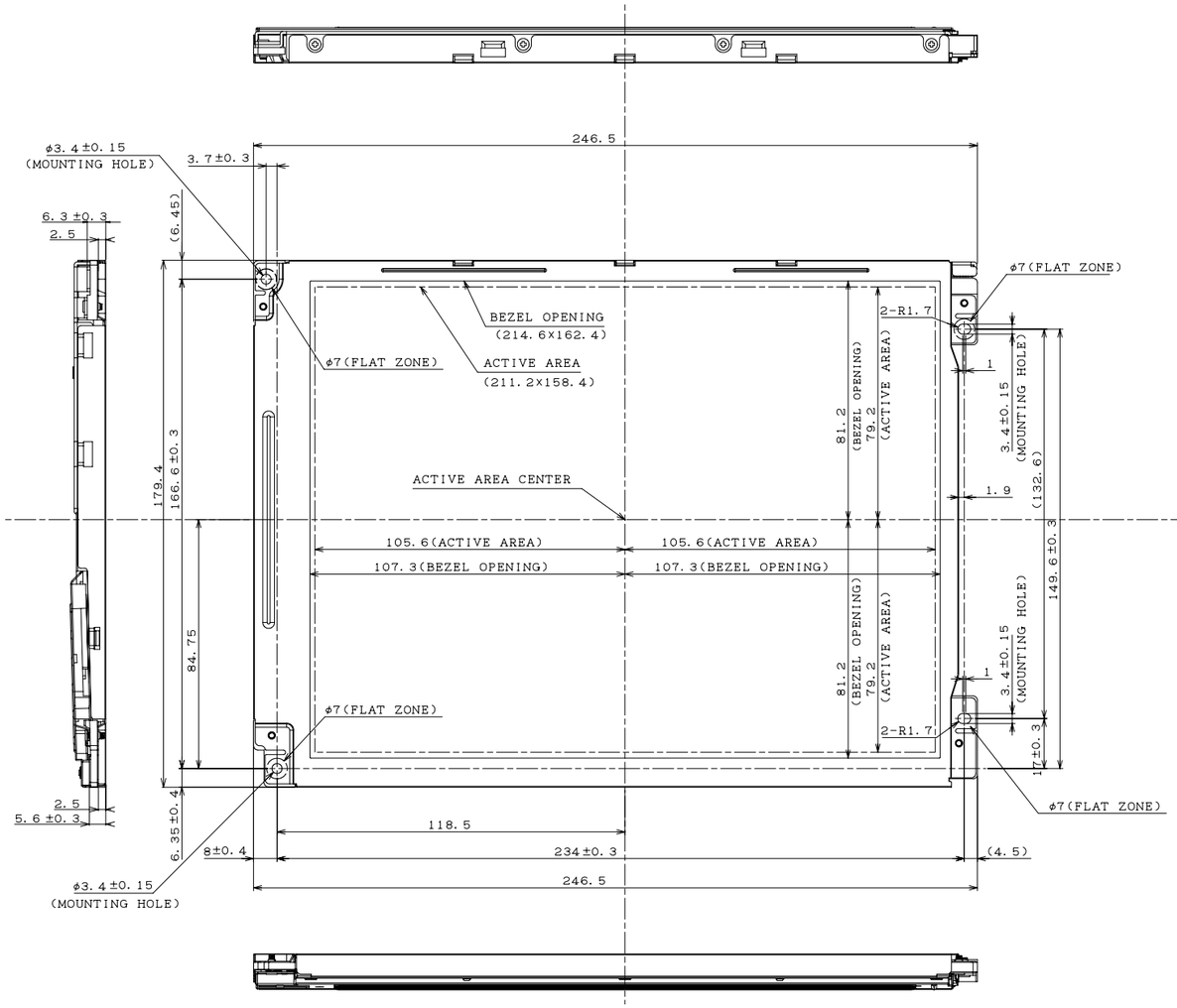
Prevention of dew * Please store the product carton either on a wooden pallet or a stand / rack to prevent dew. Do not place directly on the floor. In addition, to obtain moderate ventilation in between the pallet's top and bottom surfaces, pile the cartons up in a single direction and in order.

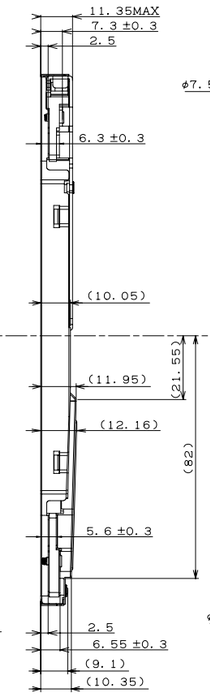
* Please place the product cartons away from the storage wall.

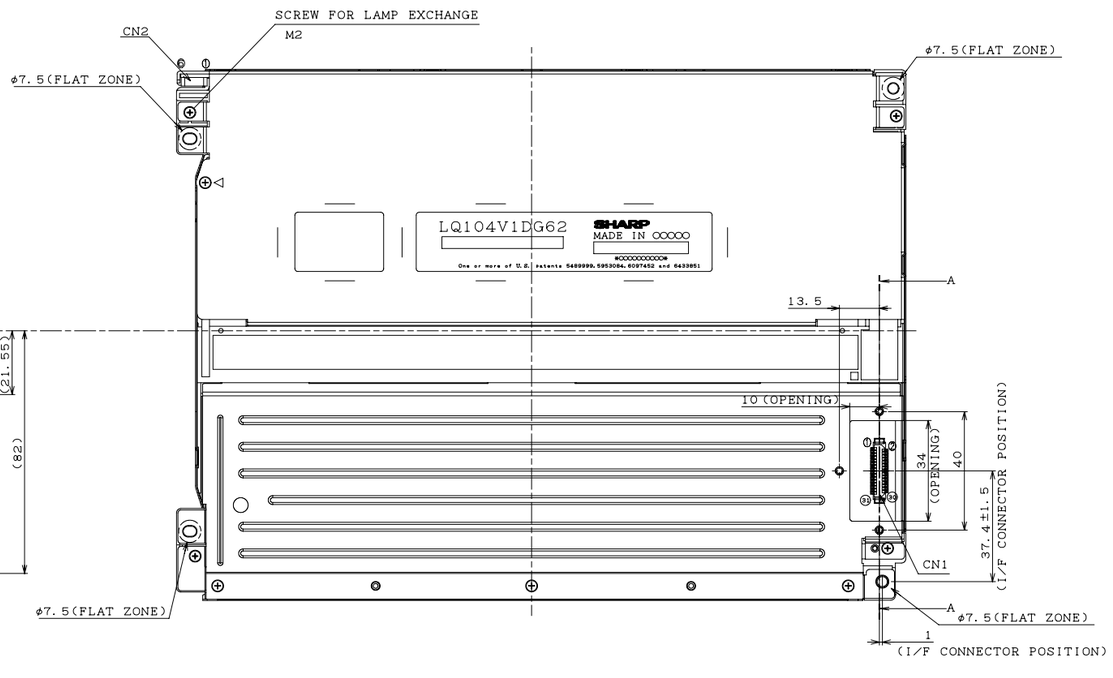
* Please maintain the storage area with an appropriate ventilation. It is recommendable to furnish the storage area with equipments such as ventilation systems.

* Please maintain the ambient temperature within the range of natural environmental fluctuation.

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







CN1：DF9MA-31P-1V(Hirose Electric Co.,Ltd.)

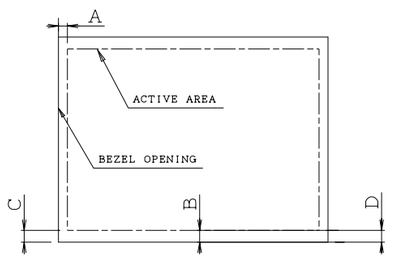
pin	1	2	3	4	5	6	7	8	9	10
	GND	CK	Hsync	Vsync	GND	R0	R1	R2	R3	R4
11	12	13	14	15	16	17	18	19	20	21
R5	GND	G0	G1	G2	G3	G4	G5	GND	B0	B1
22	23	24	25	26	27	28	29	30	31	
B2	B3	B4	B5	GND	ENAB	Vcc	Vcc	R/L	U/D	

CORRESPONDING CONNECTOR：DF9-31S-1V，DF9A-31S-1V，DF9B-31S-1V，DF9C-31S-1V

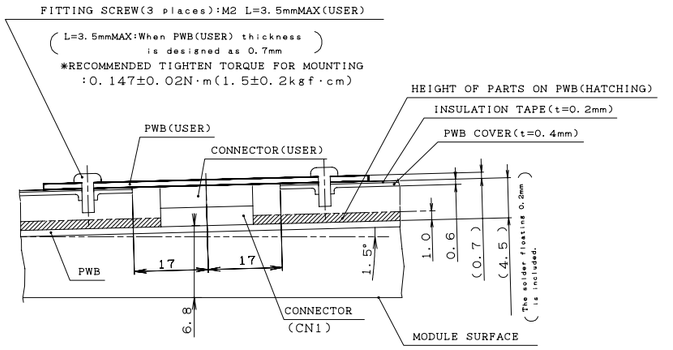
CN2：
SM06B-SRSS-TB(JST)

1	+(CH3)
2	+(CH2)
3	+(CH1)
4	-(CH1)
5	-(CH2)
6	-(CH3)

BEZEL/DISPLAY POSITION



1) TOLERANCE X-DIRECTION A：1.7±0.8
2) TOLERANCE Y-DIRECTION B：2.0±0.8
3) OBLIQUITY OF DISPLAY AREA |C-D|<0.8



SECTION A-A

NOTES
1)UNSPECIFIED TOLERANCE TO BE ±0.5
2)WARP AND FLOATING FOR PRINTED WIRING BOARD AND CHASSIS ARE EXCLUDED FROM THE THICKNESS OF THE UNIT
3)FRONT SIDE：REGARDING THE SIZE OF USER'S BOSSES. PLEASE DESIGN THEM FROM U+22056mm TO U+22057mm.
4)REAR SIDE：REGARDING THE SIZE OF USER'S BOSSES. PLEASE DESIGN THEM FROM U+22056mm TO U+22057.5mm.
5)RECOMMENDED TIGHTEN TORQUE FOR MOUNTING
0.294±0.02N·m(3.0±0.2kgf·cm)

Fig1. LQ104V1DG62 OUTLINE DIMENSIONS

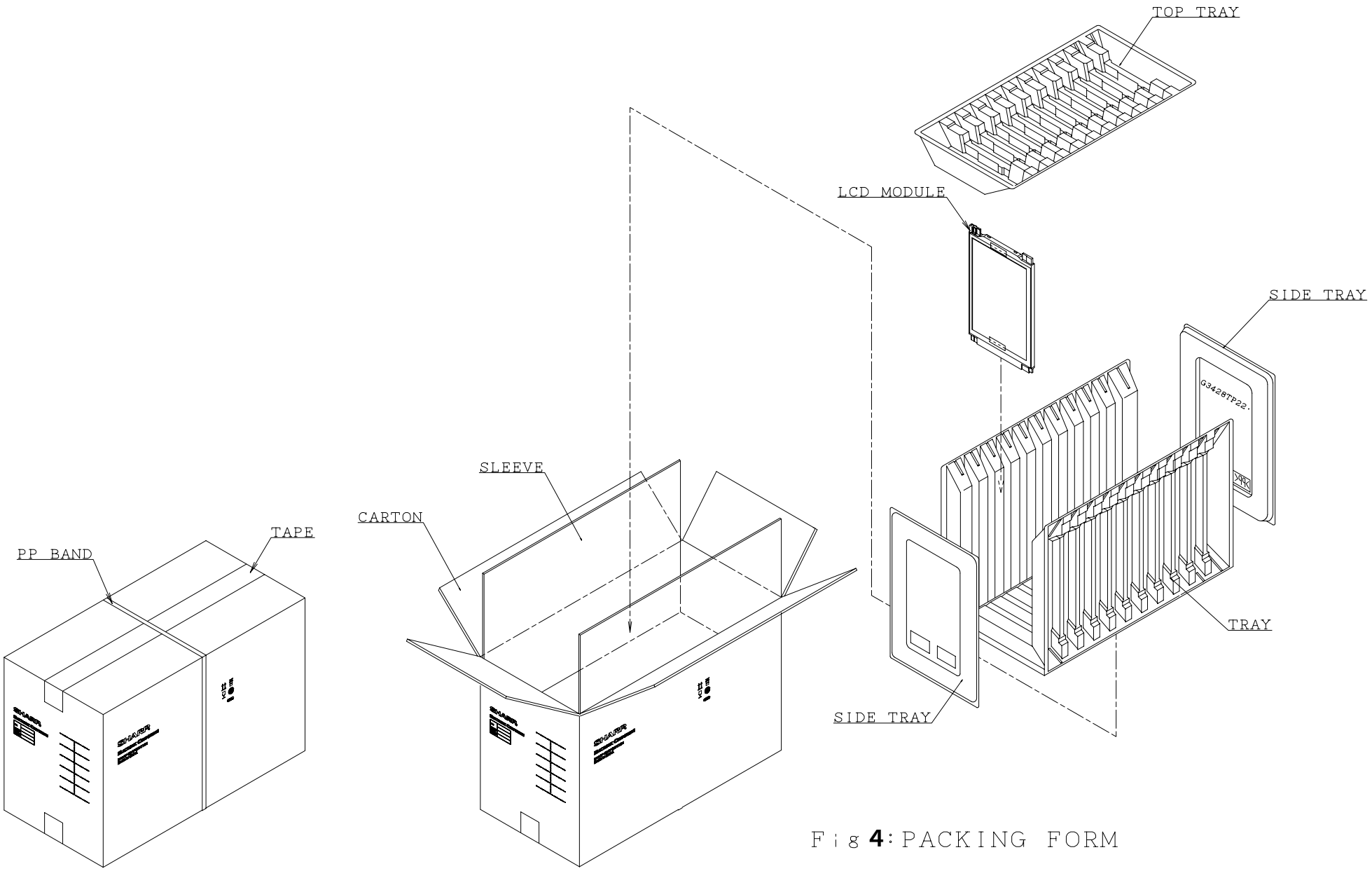


Fig 4: PACKING FORM

Technical Document

LCD Specification

LCD Group

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