LCD Specification

LQ104S1LG2A LCD Module

Product Specification
December 2008

SVGA module featuring LVDS interface,
Strong 2 rating for brightness, contrast,
operating range, and shock and
vibration tolerance; 350 nits brightness
with 500:1 contrast.

SHARP®

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	SHARP CORPORATION	APPLICABLE GROUP
	SPECIFICATION	MOBILE LIQUID CRYSTAL DISPLAY GROUP

DEVICE SPECIFICATION FOR

TFT-LCD Module

MODEL No.

LQ104S1LG2A

These parts have corresponded with the RoHS directive.

☐ CUSTOMER'S APPROVAL

DATE _____

BY _____

PRESENTED

BY *K. Shiono*

K. Shiono
General manager
ENGINEERING DEPARTMENT I
MOBILE LIQUID CRYSTAL DISPLAY DIVISION III
MOBILE LIQUID CRYSTAL DISPLAY GROUP
SHARP CORPORATION

RECORDS OF REVISION

LQ104S1LG2A

SPEC No.	DATE	PAGE	SUMMARY	NOTE
LD-20905A	Sep.30.2008	-	1 st Issue	
LD-20905B	Dec.12.2008	14	14. Reliability test items	
			High temperature operation test : "Ta = 80 ℃" is corrected to "Ta (panel surface) = 80 ℃".	
			(Operating temperature condition was described as "Panel surface" in 5. Absolute Maximum Ratings on page 5 of LD-20905A. On the other hand, "panel surface" was omitted about "Reliability test items". Therefore, this is corrected.)	
		17	OUTLINE DIMENSIONS	
			Added the tape for reinforcement to the module rear bottom.	

1. Application

This specification applies to color TFT-LCD module, LQ104S1LG2A.

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The device listed in these specification 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 (control 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 "(page 13 and 14) 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 backlight unit.

Graphics and texts can be displayed on a 800×3×600 dots panel with 262,144 colors by using LVDS

(Low Voltage Differential Signaling) system for interface and supplying +3.3V DC supply voltage for

TFT-LCD panel driving and supply voltage for backlight.

This module is super-high brightness (350cd/m^2).

This module is the type of wide viewingangle the viewing angle is 6 o'clock direction.

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

3. Mechanical Specifications

Parameter	Specifications	Unit
Display size	26 (10.4")　Diagonal	cm
Active area	211.2(H)× 158.4(V)	mm
Pixel format	800(H)× 600(V)	pixel
	(1 pixel　R　G　B dots)	
Pixel pitch	0.264(H)× 0.264(V)	mm
Pixel configuration	R,G,B vertical stripe	
Display mode	Normally white	
Unit outline dimensions *1	246.5(W)× 179.4(H)× 15.5max(D)	mm
Mass	620 max	g
Surface treatment	Anti-glare and hard-coating 3H	

*1　excluding backlight cables.

Outline dimensions is shown in page 17.

4. Input Terminals

4-1. TFT-LCD panel driving

CN1 (LVDS Signals , +3.3V DC power supply and Contorol signal)

Corresponding connector:FI-SE20ME (FPC Type) or FI-S20S (WireType)　　JAE

Pin No.	Symbol	Function	Remark
1	V_{CC}	+3.3V　power supply	
2	V_{CC}	+3.3V　power supply	
3	GND		
4	GND		
5	RXIN0-	Differential data input, CH0 (negative)	LVDS signal
6	RXIN0+	Differential data input, CH0 (positive)	LVDS signal
7	GND		
8	RXIN1-	Differential data input, CH1 (negative)	LVDS signal
9	RXIN1+	Differential data input, CH1 (positive)	LVDS signal
10	GND		
11	RXIN2-	Differential data input, CH2 (negative)	LVDS signal
12	RXIN2+	Differential data input, CH2 (positive)	LVDS signal
13	GND		
14	RXCLK IN-	Differential clock input (negative)	LVDS signal
15	RXCLK IN+	Differential clock input (positive)	LVDS signal
16	GND		
17	R/L	Horizontal display mode select signal	[Note1]
18	U/D	Vertical display mode select signal	[Note2]
19	GND		
20	GND		

[Note]　To obtain the proper relation between LVDS signals and actual digital data signals,
the digital signals should be inputted into the transmitter as described in the nextsection, 4-2.

[Note 1],[Note 2]

R/L = High, U/D = Low
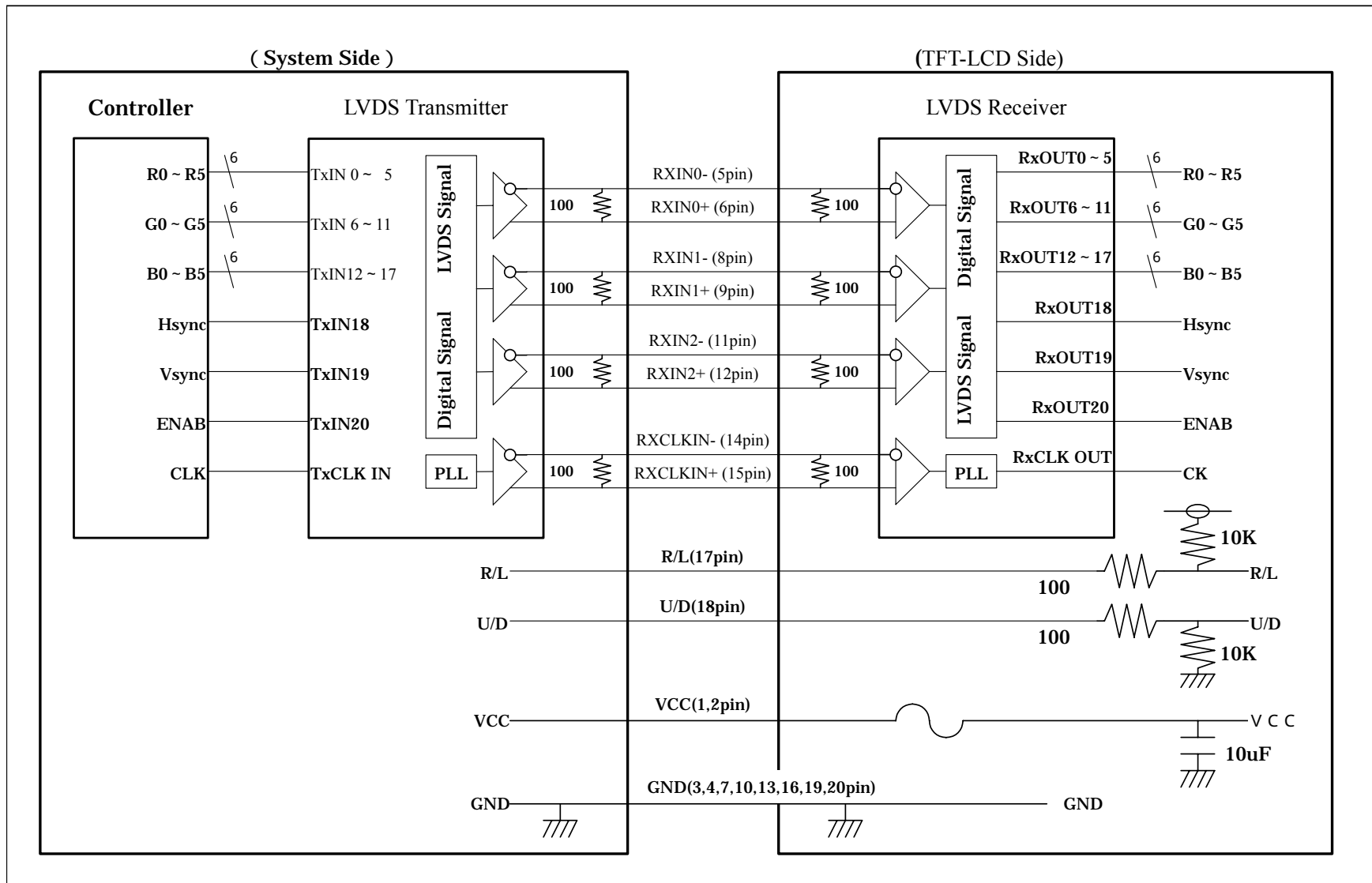

R/L = Low, U/D = Low
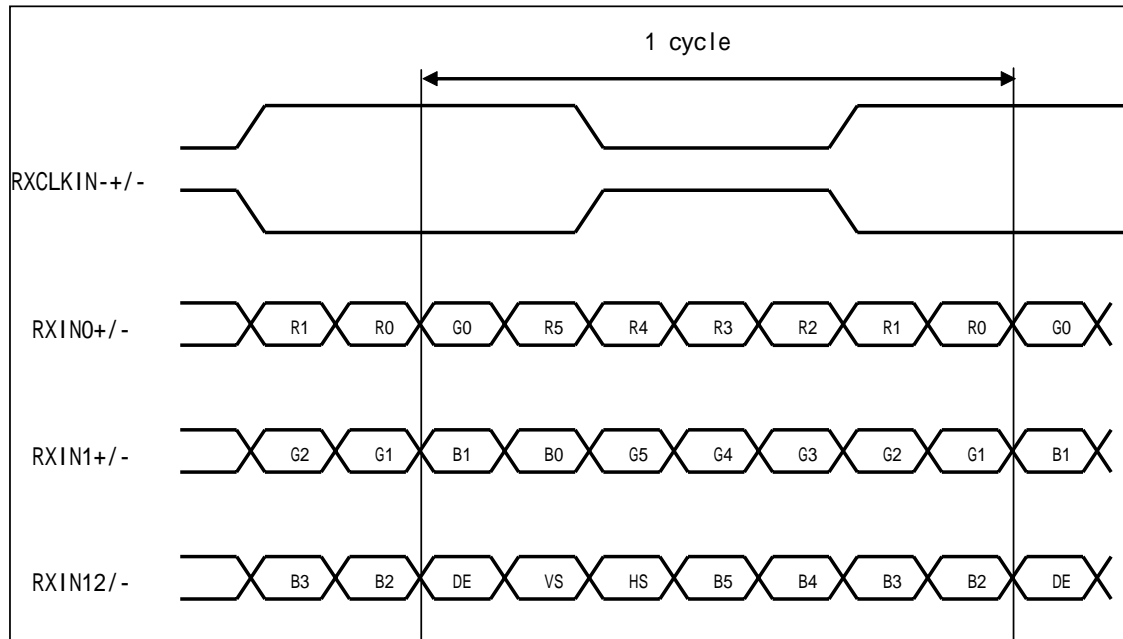

R/L = High, U/D = High

R/L = Low, U/D = High

Using receiver   Single LVDS interface, which equals THC63LVDF64A(THine),contained in a control IC

Corresponding Transmitter   DS90C363, DS90C363A, DS90C383, DS90C383A(National semiconductor),

THC63LVDF63A,THC63LVDM63A(THine), SN75LVDS84(Ti)

System Side   (TFT-LCD Side)

Controller   LVDS Transmitter   LVDS Receiver

Controller	LVDS Transmitter		Receiver

R0   R5 — TxIN 0   5

G0   G5 — TxIN 6   11

B0   B5 — TxIN12   17

Hsync — **TxIN18**

Vsync — **TxIN19**

ENAB — **TxIN20**

CLK — **TxCLK IN**   **PLL**

RXIN0- (5pin)
100   RXIN0+ (6pin)   100

RXIN1- (8pin)
100   RXIN1+ (9pin)   100

RXIN2- (11pin)
100   RXIN2+ (12pin)   100

RXCLKIN- (14pin)
100   RXCLKIN+ (15pin)   100

RxOUT0   5 — R0   R5

RxOUT6   11 — G0   G5

RxOUT12   17 — B0   B5

RxOUT18 — Hsync

RxOUT19 — Vsync

RxOUT20 — ENAB

RxCLK OUT   **PLL** — CK

R/L — **R/L(17pin)** — **100** — R/L   **10K**

U/D — **U/D(18pin)** — **100** — U/D   **10K**

VCC — **VCC(1,2pin)** — **10uF**

GND — **GND(3,4,7,10,13,16,19,20pin)** — GND

LD20905B-4

[Note]　Data Mapping

4-3. Backlight driving

CN2 ,CN3

Using connector　　　　: BHR-02(8.0)VS-1N (JST)
Corresponding connector　: SM02(8.0)B-BHS (JST)

Pin no.	symbol	Function	Color of FL cable	
			CN2	CN3
1	V_{HIGH}	Power supply for lamp (High voltage side)	Pink	Pink
2	V_{LOW}	Power supply for lamp (Low voltage side)	White	White

5. Absolute Maximum Ratings

Parameter	Symbol	Condition	Pin name	Ratings	Unit	Remark
+3.3V supply voltage	Vcc	Ta=25 ^{o}C	Vcc	0 to + 4.0	V	
Input voltage	V_{I1}	Ta=25 ^{o}C	RXINi-/+(i= 0,1,2) RXCLK IN-/+	-0.3 to Vcc+0.3		
	V_{I2}	Ta=25 ^{o}C	R/L , U/D	-0.3 to Vcc+0.3	V	
Storage temperature	Tstg	-		-30 to +80	^{o}C	[Note1]
Operating temperature	Topa	Panel surface		-30 to +80	^{o}C	[Note2]

Note1　Humidity　95%RH Max. at Ta　40　.

Maximum wet-bulb temperature at 39　　or less at Ta>40　.　　No condensation.

Note2　There is a possibility of causing deterioration in the irregularity and others of the screen and the display fineness when preserving or using it from 60 to 80　.

6.Recommended operation condition

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply voltage		3.0	+3.3	3.6		[Note1]
LVDS Signals	L	0		2.4		[Note2]
Input voltage		0		Vcc		[Note3]
Temperature (Panel surface)		-30		+80		[Note4]

[Note1]On-off conditions for supply voltage

    0<t1 15ms

    0<t2 10ms

    0<t3 100ms

    0<t4 1s

200ms<t5

Vcc-dip conditions

  1) 2.5V Vcc

      td 10ms

  2) Vcc<2.5V

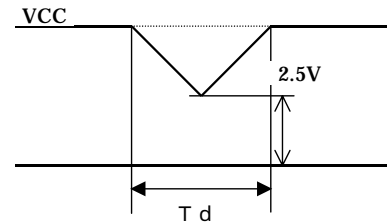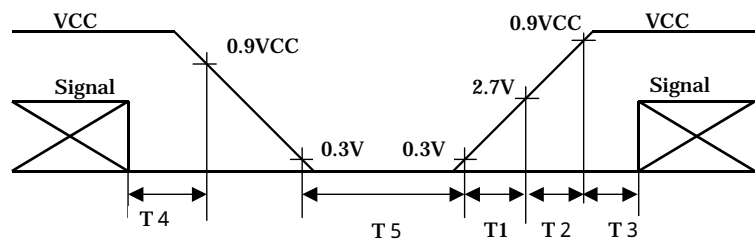   Vcc-dip conditions should also follow the On-off

    conditions for supply voltage

[Note2] RXIN0-, RXIN0+,RXIN1-,RXIN1+,RXIN2-,RXIN2+,

      RXCLK IN-,RXCLK IN+

[Note3] R/L, U/D

[Note4] Humidity: 95%RH Max. at Ta=<40°C.

      Maximum wet-bulb temperature at 39°C or less at Ta>40 ^{o}C.

      No condensation.

7. Electrical Characteristics

7-1.TFT-LCD panel driving   Ta=25 ^{o}C

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Current dissipation	Vcc=+3.3V	Icc	-	310	510	mA	[Note1]
Permissive input ripple voltage		VRP	-	-	100	mVp-p	
Input voltage range	LVDS signal	VL	0	-	2.4	V	[Note2]
Differential input threshold voltage	High	VTH	-	-	$V_{CM}+$ 100	mV	V_{CM}=1.2V
	Low	VTL	$V_{CM}-$ 100	-	-	mV	[Note3]
Input impedance (Differential input)		RT	-	100	-		[Note2]
Input voltage	Low	VIL	-	-	0.8	V	[Note4]
	High	VIH	2.1	-	-		[Note5]
Input current1	Low(VI=0V)	IOL1	-800	-	-		[Note4]
	High(VI=Vcc)	IOH1	-10.0	-	10.0		
Input current2	Low(VI=0V)	IOL2	-20.0	-	10.0	uA	[Note5]
	High(VI=Vcc)	IOH2	-	-	800	uA	

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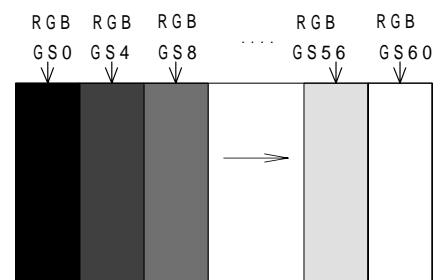
    Vcc=+3.3V

[Note2] LVDS signals

[Note3] V_{CM} : Common mode voltage of LVDS driver.

[Note4] R/L

[Note5] U/D

7-2. Backlight driving

The backlight system is an edge-lighting type with double CCFT (Cold Cathode Fluorescent Tube).
The characteristics of single lamp are shown in the following table.
(It is usually required to measure under the following condition. I_L=6.0mA,Ta=25 $\pm$ 2 ,F_L=60kHz.)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark	
Lamp current	I_L	3.5	6.0	7.0	mA rms	[Note1]	
Lamp power consumption	P_L	-	2.8	-	W	[Note2]	
Lamp frequency	F_L	35	60	70	kHz	[Note3]	
Kick-off voltage	Vs	-	-	1300	V rms	Inverter output Ta=-30°C	[Note4]

[Note1] Lamp current is measured with current meter for high frequency as shown below.
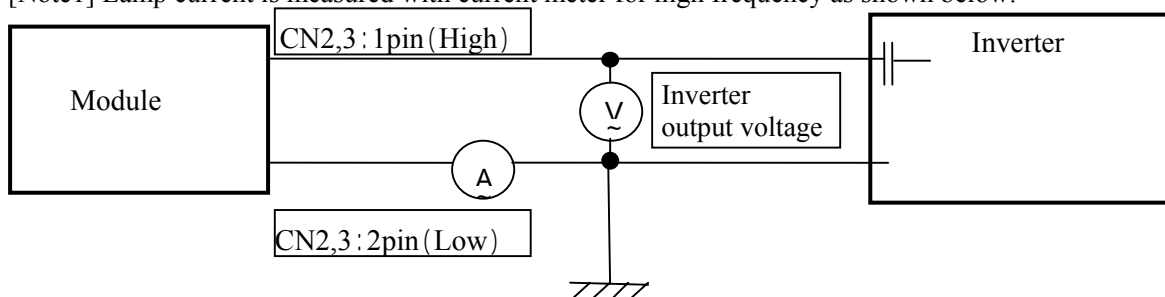
[Note2] Referential data per one CCFT by calculation. ($I_L \times V_L$)
The data don't include loss at inverter.   (I_L = 6.0mArms)
[Note3] Lamp frequency may produce interference with horizontal synchronous frequency, and this may cause beat on the display. Therefore lamp frequency shall be detached as much as possible from the horizontal synchronous frequency and from the harmonics of horizontal synchronous to avoid interference.
[Note4] The open output voltage of the inverter shall be maintained for more than 1s;
otherwise the lamp may not be turned on.
[Note5] Lamp is consumables. In the following condition, the lamp life time is 50,000 hours as the reference value and it is not guaranteed in this specification sheet by SHARP.
Above value is applicable when lamp (the long side of LCD module) is placed horizontally. (Landscape position)
Lamp life time is defined that it applied either   or   under this condition.
(Continuous turning on at Ta = 25 ^{o}C, I_L = 6.0mA rms)
Brightness becomes 50% of the original value under standard condition.
Kick-off voltage at Ta = -30 ^{o}C exceeds maximum value (1300Vrms).
Lamp life time shortens according to the state of mounting and use.
(Lamp lifetime may vary if lamp is in portrait position due to the change of mercury density inside the lamp.)
In case of operating under lower temp environment, the lamp exhaustion is accelerated
and the brightness becomes lower.
Continuous operating for around 1 month under lower temp condition may reduce the brightness to half of the original brightness.
In case of such usage under lower temp environment, periodical lamp exchange is recommended.
[Note6] The performance of the backlight, for example life time or brightness, is much influenced by the characteristics of the DC-AC inverter for the lamp.
When you design or order the inverter, please make sure that a poor lighting caused by the mismatch of the backlight and the inverter (miss-lighting,flicker, etc.) never occur. when you confirm it, the module should be operated in the same condition as it is installed in your instrument.
Be sure to use a back light power supply with the safety protection circuit such as the detection circuit for the excess voltage, excess current and or electric discharge waveform.
Be sure to use the detect circuit by which one side of the CCFT lamps can be controlled independently.
Otherwise, when one side of the CCFT is open, the excess current may possibly be applied to the other side of the lamp.
[Note7] It is required to have the inverter designed so that to allow the impedance deviation of the two CCFT lamps and the capacity deviation of barast capacitor.
[Note8] Please make it to the structure not touching directly insulating the high voltage part.
Please stop the circuit by the protection element such as fuses for generation of heat and the ignition prevention, and use a flame resisting and high material for the substrate and the resin material.
[Note9] Under the environment of 10lx or less, miss-lighting delay may occur.

8. Timing characteristics of input signals
 8-1. Timing characteristics
    (These are specified at the digital inputs/outputs of LVDS transmitter/receiver.)
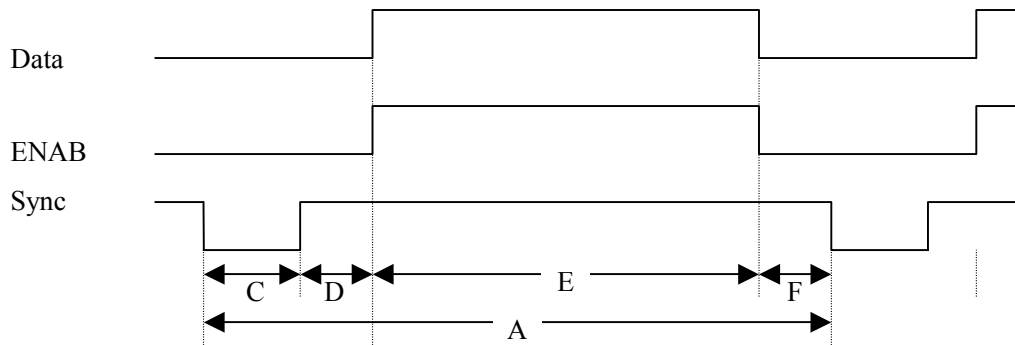
(Vertical timing)

Item(symbol)	Min.	Typ.	Max.	Unit	Remark
Vsync cycle (T_{VA})	-	17.6	-	ms	Negative
	628	666	798	line	
Vsync pulse width (T_{VC})	2	4	6	line	
Back porch (T_{VD})	23	23	23	line	
Vsync pulse width+Back porch ($T_{VC}+T_{VD}$)	25	27	29	line	
Active display area (T_{VE})	600	600	600	line	
Front porch (T_{VF})	3	39	-	line	

(Horizontal timing)

Item(symbol)	Min.	Typ.	Max.	Unit	Remark
Hsync cycle (T_{HA})	20.8	26.4	39.9	us	Negative
	832	1056	1395	clock	
Hsync pulse width (T_{HC})	2	128	200	clock	
Back porch (T_{HD})	0	-	-	clock	When ENAB signal is input.
	88	88	88	clock	When ENAB signal is fixed to low level.
Active display area (T_{HE})	800	800	800	clock	
Front porch (T_{HF})	-	40	-	clock	

(Clock signal)

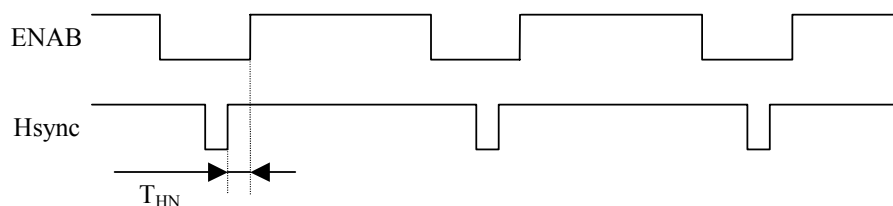| Item	Min.	Typ.	Max.	Unit	Remark
Frequency	35	40	42	MHz	[Note1]

 [Note1] In case of lower frequency, the deterioration of display quality, flicker etc., may be occurred.

(Hsync-Vsync Phase difference)
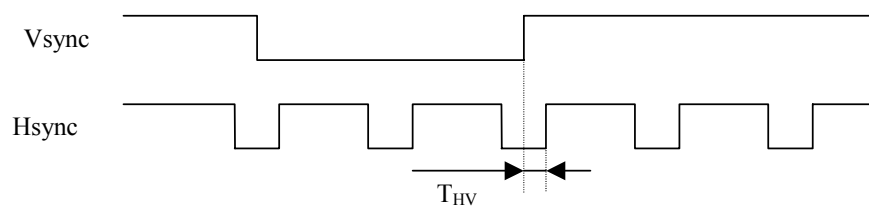
Item(symbol)	Min.	Typ.	Max.	Unit	Remark
Hsync-Vsync Phase difference (T_{HV})	1	-	T_{HA}-T_{HC}	clock	

(Hsync-ENAB Phase difference)

Item	Min.	Typ.	Max.	Unit	Remark
Hsync-ENAB Phase difference (T_{HN})	0	-	T_{HA}-T_{HC} -800	clock	

8-2　Display position

Item	Standards	Beginning	Ending	Unit	Remark
Horizontal	rising edge of ENAB	0	800	clock	
	rising edge of Hsync	88	888	clock	[Note1]
Vertical	rising edge of Vsync	23	623	line	

[Note1]　In case that ENAB signal is fixed to low level.

8-3. Input Data Signals and Display Position on the screen

Display position of input data

(H , V

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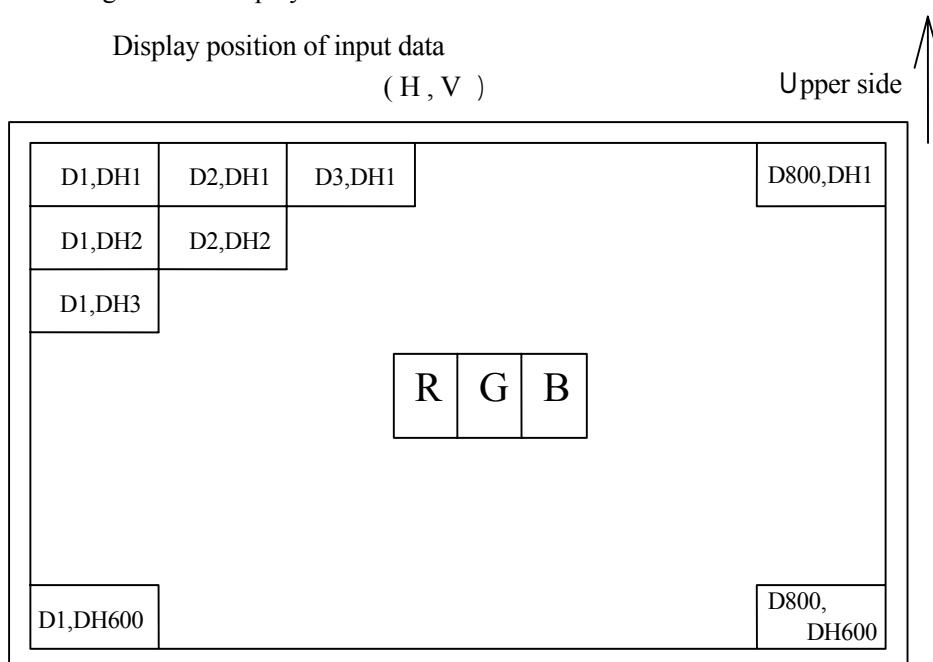
9. Input Signals, Basic Display Colors and Gray Scale of Each Color

Colors & Gray scale		Gray Scale	Data signal																	
			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   , Vcc=+3.3V

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angle range	Horizontal	21, 22	CR>10	60	70	-	Deg.	[Note1]
	Vertical	11		45	50	-	Deg.	[Note4]
		12		45	60	-	Deg.	
Contrast ratio		CRn	=0°	150	-	-		[Note2]
		CRo	Optimum viewing angle	-	500	-		[Note4]
Response time	Rise	r	=0°	-	10	-	ms	[Note3]
	Decay	d		-	25	-	ms	[Note4]
Chromaticity of white		x		0.263	0.313	0.363		[Note4]
		y		0.279	0.329	0.379		I_L=6.0mArms
Luminance of white		Y_L		280	350	-	cd/m²	F_L=60kHz
White Uniformity		δ_W		-	-	1.45		[Note5]
Viewing Angle range as a Brightness Definition	Horizontal	21, 22	50% of the maximum brightness	-	35	-	Deg.	[Note1]
	Vertical	11		-	25	-	Deg.	(Reference value)
		12		-	30	-	Deg.	

[Note] The measurement shall be executed 30 minutes after lighting at rating. (condition:I_L=6.0mA rms)
The optical characteristics shall be measured in a dark room or equivalent state with
the method shown in Fig.1 below.

Photodetector(EZ-CONTRAST

Center of screen(=0°

TFT-LCD-
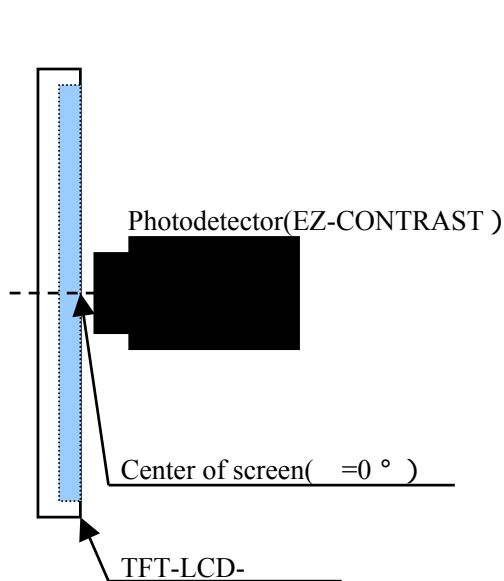
Fig.1-1 Viewing angle measurement method

Photodetector
Response Time(BM-5A)
Contrast ratio/Luminance/
Chromaticity(SR-3)

400mm

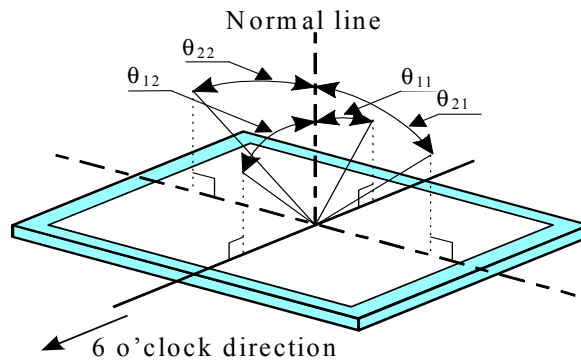Field=1°

Center of screen(=0°)

TFT-LCD-Module
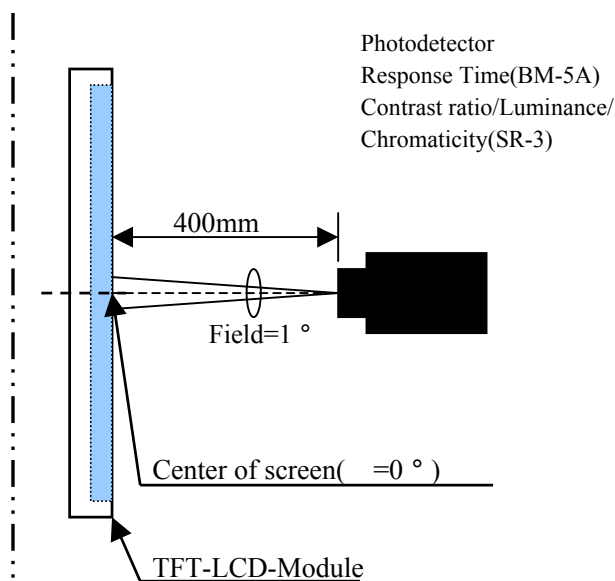
Fig.1-2 Luminance/Contrast ratio/Response time/Chromaticity
measurement method

Fig.1 Optical characteristics measurement method

[Note1] Definitions of viewing angle range:

[Note2] Definition of contrast ratio:

The contrast ratio is defined as the following.

$$\text{Contrast Ratio (CR)} = \frac{\text{Luminance (brightness) with all pixels white}}{\text{Luminance (brightness) with all pixels black}}$$
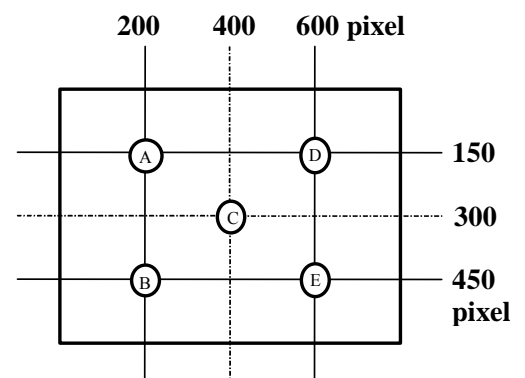
[Note3] Definition of response time:

The response time is defined as the following figure and shall be measured by switching the input signal for "black" and "white" .
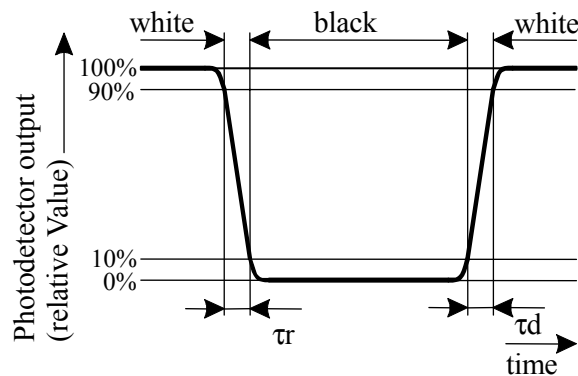
[Note4] This shall be measured at center of the screen.

[Note5] Definition of white uniformity:

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

$$\text{w} \quad \frac{\text{Maximum Luminance of five points (brightness)}}{\text{Minimum Luminance of five points (brightness)}}$$

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 $_2$ 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. The panel characteristic might be deteriorated and the display fineness decrease

when strong light is irradiated to the liquid crystal panel.

l) Connect GND to 4 place of mounting holes to stabilize against EMI and external noise.

m) There are high voltage portions on the backlight and very dangerous. Careless touch may lead to electrical shock.

When exchange lamps or service, turn off the power without tail.

n) When handling LCD modules and assembling them into cabinets, 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, causes corrosion and discoloration of the modules.

Therefore, please avoid these use.

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 regardress of contact or noncontact to polarizer film.

Be sure to confirm the component of them.

o) Cold cathode fluorescent lamp in LCD panel contains a small amount of mercury, please follow local ordinances

or regulations for disposal.

p) Be careful of a back light lead not to pull by force at the time of the wiring to an inverter, or line processing.

q) 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.

r) 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.

s) Notice:Never dismantle the module , because it will cause failure. Moreover, please do not peel off the tapes other than

the creped paper tape (yellow tape) of a protection film pasted to the product and a lamp connector temporary stop.

t) 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.)

u) 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.

v) 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.

w)The lamp used for this product is very sensitive to the temperature.

Luminance decreases rapidly when it is used for a long time or repeatedly under the environment of the low temperature or the module is being cooled.

Please avoid the continuous or repeating use of it under such an environment.

It may decrease up to 50% of the initial luminance in about one month under the low temperature environment.

Please consult our company when it is used under the environment like the above mentioned.

13. Packing form

Product countries / Areas	JAPAN	CHINA
Piling number of cartons	5(Max)	
Package quantity in one carton	20pcs	
Carton size	494(W)× 326(D)× 433(H)	
Total mass of one carton filled with full modules	15.6kg(Max)	
Packing form is shown	Page 18	

14　Reliability test items

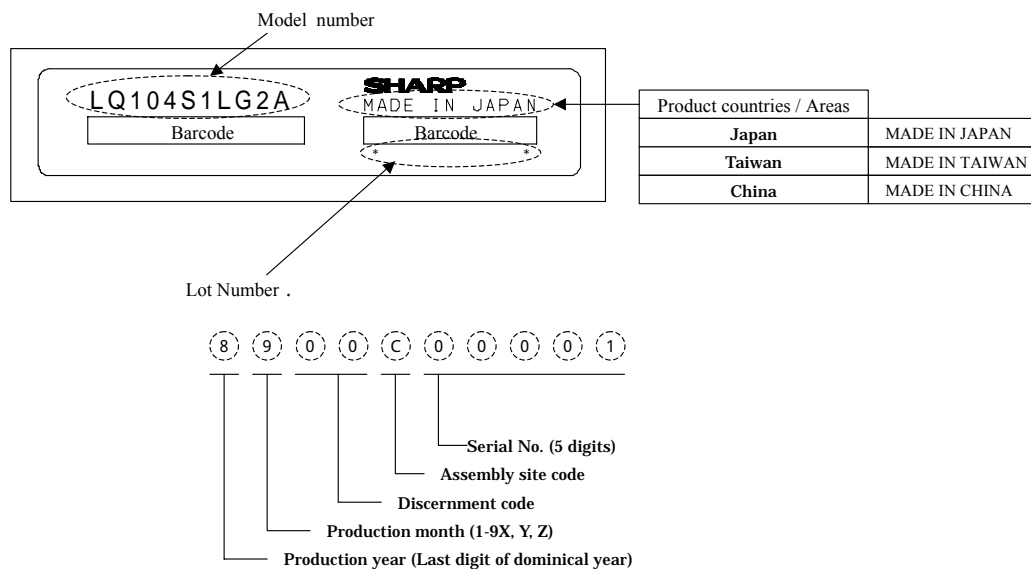| No.	Test item	Conditions	Remark
1	High temperature storage test	Ta=80　240h	
2	Low temperature storage test	Ta= -30　240h	
3	High temperature operation test	Ta (panel surface)=80　240h	
4	Low temperature operation test	Ta= -30　240h	
5	High temperature & high humidity operation test	Ta=40　; 95%RH　240h (No condensation)	
6	Vibration test (non- operating)	Frequency: 10　57Hz/Vibration width (one side):0.153mm 　　　: 57　500Hz/Gravity:14.7m/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 330) 　　　non-operating = ± 10kV,　operating = ± 8kV Atmospheric discharge　(150pF 330) 　　　non-operating = ± 20kV,　operating = ± 15kV	
9	EMI	Measurement in 10m site	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)
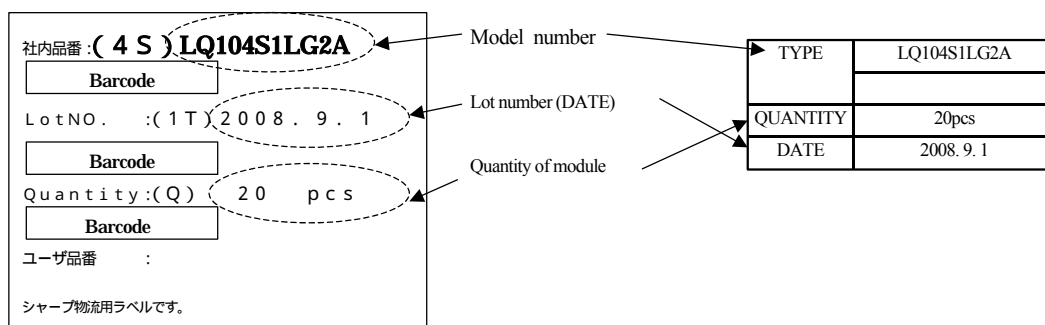
15.Others

15-1. Label

Lot No. Label:

Model number

LQ1O4S1LG2A   **SHARP**
              MADE IN JAPAN

| Barcode | Barcode |

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

Lot Number

Serial No. (5 digits)

Assembly site code

Discernment code

Production month (1-9X, Y, Z)

Production year (Last digit of dominical year)

Packing box Label:

Quantity of module : Japan or China

LQ104S1LG2A

| **Barcode** |

| **Barcode** |

| **Barcode** |

Model number

Lot number (DATE)

Quantity of module

Quantity of module : Taiwan

TYPE	LQ104S1LG2A
QUANTITY	20pcs
DATE	2008. 9. 1

The figure right below is written to the packing box of the settlement for the RoHS restriction.
R.C. RoHS Compliance means it suits the RoHS directive.
This LCD module is compliant with RoHS Directive.

Internal Use Only
. .

15-2. The chemical ozone depleting substance is not used.

15-3. Cold cathode fluorescent lamp in LCD panel contains a small amount of mercury, please follow

local ordinances or regulations for disposal. (It marks on the back of the module.)

```
COLD CATHODE FLUORESCENT LAMP IN LCD PANEL
CONTAINS A SMALL AMOUNT OF MERCURY, PLEASE FOLLOW
LOCAL ORDINANCES OR REGULATIONS FOR DISPOSAL.
```

15-4. Keeping environment condition

Temperature   0   40

Relative humidity   95% or less

Note   Please manage as a mean value of the keeping temperature humidity environment referring to

the following condition.

Summer time 20   35   85% or less

Winter   5   15   85% or less

Please manage in total within 240 hours at the time kept under the environment of 40   ,95%RH.

Direct sunshine

Please keep it in the state of wrapping or the darkroom so that direct sunshine should not strike directly

into the product.

Atmosphere

Please do not keep it in the place with the danger of the generation of the causticity gas and the

volatile solvent.

Asking for be dewy prevention

Please do not put directly on the floor, and keep the wrapping box on the palette or the stand to avoid

the be dewy. Moreover, please arrange it in a constant direction correctly to improve ventilation under

the palette.

Please separate from the wall in the storage warehouse and keep it.

Please note that ventilation is improved and consider the installation such as ventilators in the warehouse.

Please manage so that there is no rapid temperature change more than natural environment.
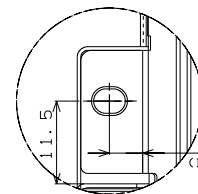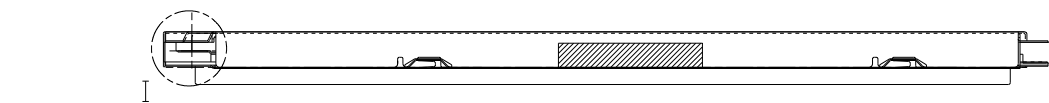
Keeping period

Please make it to keeping within one year under the above-mentioned keeping condition.

15-5. If any problem occurs in relation to the description of this specification, it shall be resolved

through discussion with spirit of cooperation.

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

DETAIL OF MODULE S/N LABEL

MODEL NAME
BARCODE

LQ104S1LG2A

SHARP
MADE IN *****

One or more of U.S. patents 5489999, 5953084, 6097452 and 6433851

生産国/地域	
JAPAN	MADE IN JAPAN
CHINA	MADE IN CHINA

Barcode
— Serial No. (5 digits)
— Assembly site code
— Discernment code
— Production month(1-9X.Y.Z)
— Production year(Last digit of dominical year)

ENVIRONMENT READING THE NOTE

·COLD CATHODE FLUORESCENT LAMP IN LCD PANEL
CONTAINS A SMALL AMOUNT OF MERCURY.PLEASE FOLLOW
LOCAL ORDINANCES OR REGULATIONS FOR DISPOSAL.
·当該液晶ディスプレイパネルは蛍光管が組込まれていますので、地方自
治体の条例、または、規則に従って廃棄してください。

BEZEL OPENING
(214.6x162.4)

ACTIVE AREA
(211.2x158.4)

ACTIVE AREA CENTER

105.6(ACTIVE AREA)　105.6(ACTIVE AREA)
107.3(BEZEL OPENING)　107.3(BEZEL OPENING)

81.2(BEZEL OPENING)
79.2(ACTIVE AREA)

81.2(BEZEL OPENING)
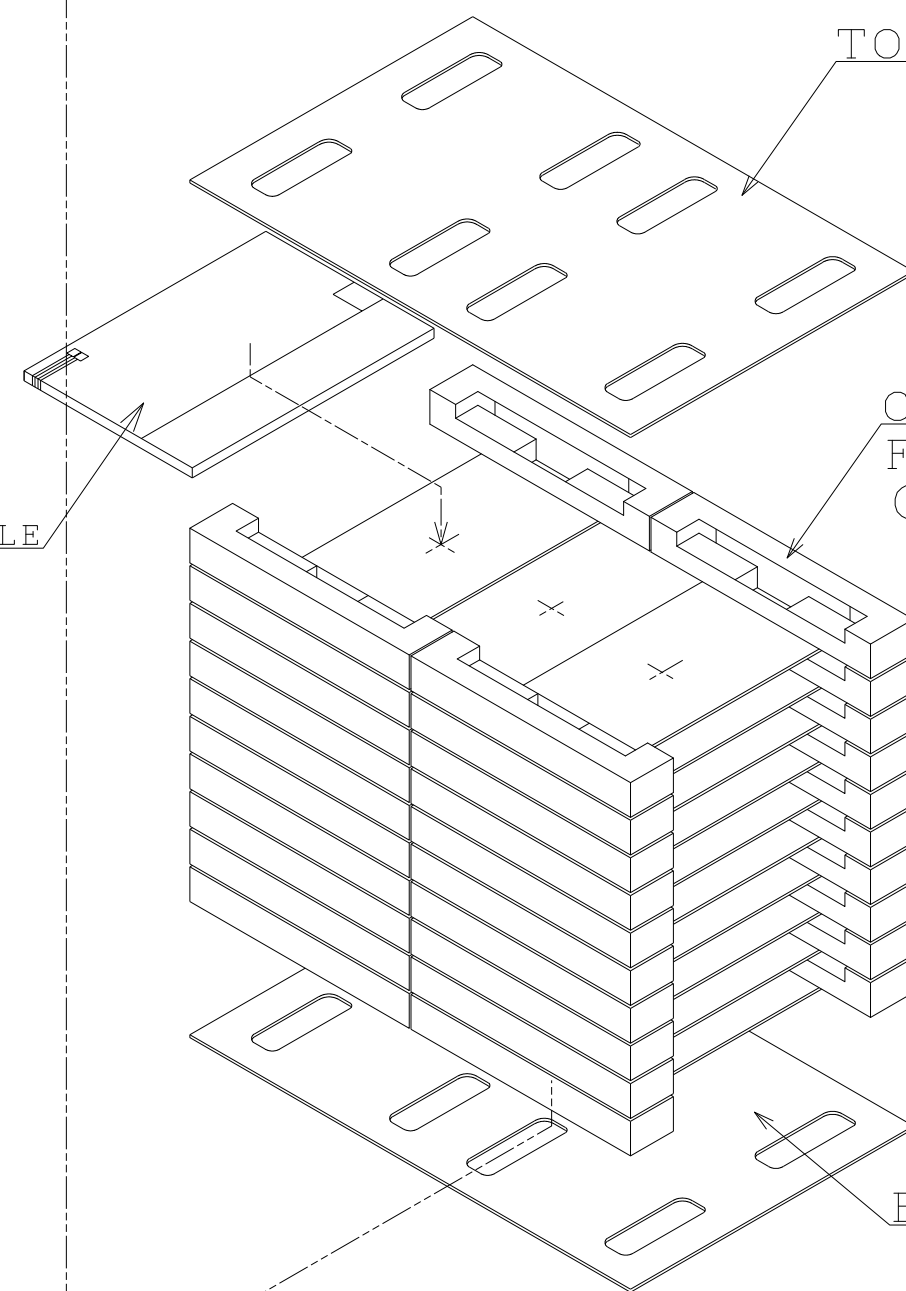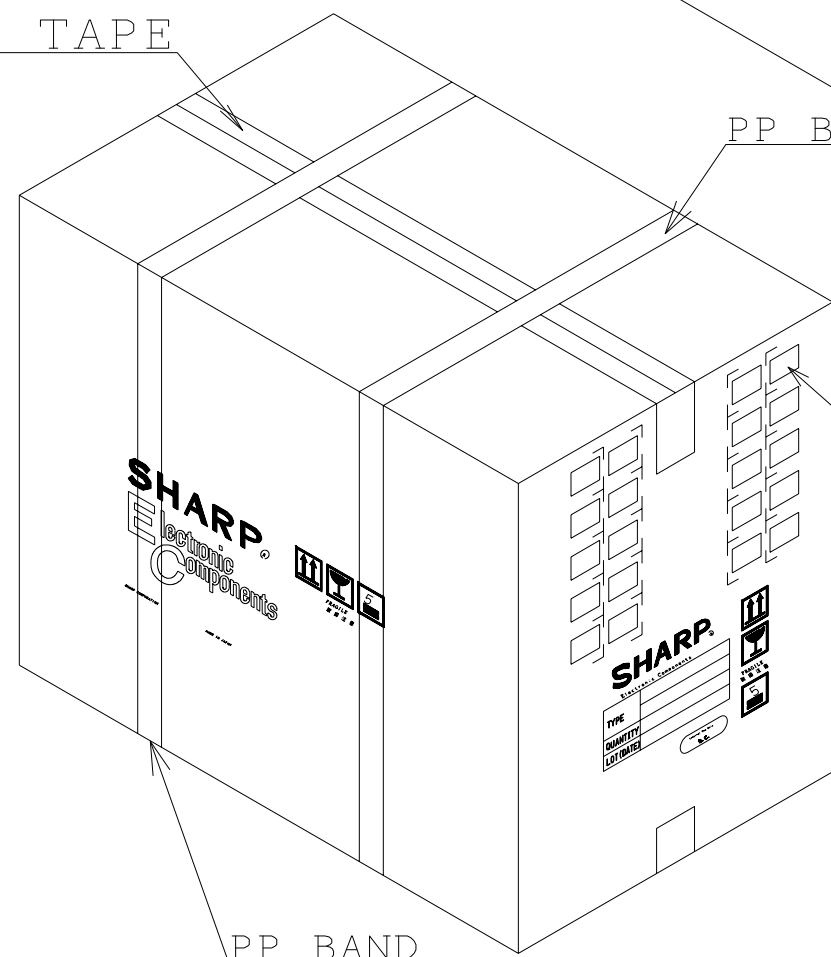79.2(ACTIVE AREA)

246.4
126.5
122.2
90 +1.5/0
15.5max
5.6
2.5 ±0.3

CN2
1.HOT
2 GND
CN3
1.HOT
2 GND

166.6±0.3
179.4
91.1
84.75
77.5
118.5
234 ±0.3

51.5
132.6 ±0.3
113.6
60.2
67.75
75.5
40.7

2.5 ±0.3
5.6
10.15
11.8

MODULE S/N LABEL　ENVIRONMENT READING THE NOTE

LQ104S1LG2A
SHARP
MADE IN *****

One or more of U.S. patents 5489999, 5953084, 6097452 and 6433851

BL LOT LABEL

******-*
******-**

CN1

208.5
118.5
28.5
0.5
5.6
2.5±0.3
12.9
19.7 19.7
37.8
39.35
13
10

2.5±0.3
5.6

INTERFACE CONNECTOR
CN1:20186-20E-13(I-PEX)
PIN LAYOUT

pin	1	2	3	4	5	6	7
	VCC	VCC	GND	GND	RXIN0-	RXIN0+	GND
8	9	10	11	12	13	14	15
RXIN1-	RXIN1+	GND	RXIN2-	RXIN2+	GND	RCLKIN-	RCLKIN+
16	17	18	19	20			
GND	R/L	U/D	GND	GND			

CORRESPONDING CONNECTOR:FI-SE20M(FPC type),FI-S20S(Wire type)

CCFT CONNECTOR
CN2,CN3:BHR-02(8.0)VS-1N (JST)
PIN LAYOUT

1	V_{HIGH}
2	NC
3	V_{LOW}

CORRESPONDING CONNECTOR:SM02(8.0)B-BHS

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 HEIGHT OF USER'S BOSSES.
   PLEASE DESIGN THEM FROM φ6mm TO φ7mm.
4. REAR SIDE:REGARDING THE HEIGHT OF USER'S BOSSES.
   PLEASE DESIGN THEM FROM φ6mm TO φ7.5mm.

5.6
2.5 ±0.3

ENLARGED
DETAIL I

φ3.4±0.15
(CLAMP HOLE)
4.5
(FLAT PART4.0)

R4.5
(FLAT PART R4)

ENLARGED
DETAIL A

φ3.4±0.15
(CLAMP HOLE)
4.4
(FLAT PART3.9)
7.6

ENLARGED
DETAIL B

3.4±0.15
(CLAMP HOLE)
1
4.2(FLAT PART3.7)

ENLARGED
DETAIL C

3.4±0.15
(CLAMP HOLE)
1
4.2
(FLAT PART3.7)

ENLARGED
DETAIL D

11.5
4.3
(FLAT PART3.8)

ENLARGED
DETAIL E

7.1
4.8
(FLAT PART4.3)

ENLARGED
DETAIL G

6.05
4.95
4.8
(FLAT PART4.3)

ENLARGED
DETAIL F

4.65
(FLAT PART4.15)
5.5

ENLARGED
DETAIL H

LQ104S1LG2A OUTLINE DIMENSIONS

LD20905B-17

MASTER CARTON

TOP PAD

CORRUGATED
FIBER BOARD
(TRAY)

TFT-LCD MODULE

OPP TAPE

PP BAND

S/N LABEL

BOTTOM PAD

PP BAND

< PACKING FORM >

LD20905B-18

SHARP®

NORTH AMERICA

Sharp Microelectronics of the Americas
5700 NW Pacific Rim Blvd.
Camas, WA 98607, U.S.A.
Phone: (1) 360-834-8700
Fax: (1) 360-834-8903
www.sharpsma.com

TAIWAN

Sharp Electronic Components
(Taiwan) Corporation
8F-A, No. 16, Sec. 4, Nanking E. Rd.
Taipei, Taiwan, Republic of China
Phone: (886) 2-2577-7341
Fax: (886) 2-2577-7326/2-2577-7328

CHINA

Sharp Microelectronics of China
(Shanghai) Co., Ltd.
28 Xin Jin Qiao Road King Tower 16F
Pudong Shanghai, 201206 P.R. China
Phone: (86) 21-5854-7710/21-5834-6056
Fax: (86) 21-5854-4340/21-5834-6057
Head Office:
No. 360, Bashen Road,
Xin Development Bldg. 22
Waigaoqiao Free Trade Zone Shanghai
200131 P.R. China
Email: smc@china.global.sharp.co.jp

EUROPE

Sharp Microelectronics Europe
Division of Sharp Electronics (Europe) GmbH
Sonninstrasse 3
20097 Hamburg, Germany
Phone: 49 (0)180 507 35 07
Fax: (49) 40-2376-2232
www.sharpsme.com

SINGAPORE

Sharp Electronics (Singapore) PTE., Ltd.
438A, Alexandra Road, #05-01/02
Alexandra Technopark,
Singapore 119967
Phone: (65) 271-3566
Fax: (65) 271-3855

KOREA

Sharp Electronic Components
(Korea) Corporation
RM 501 Geosung B/D, 541
Dohwa-dong, Mapo-ku
Seoul 121-701, Korea
Phone: (82) 2-711-5813 ~ 8
Fax: (82) 2-711-5819

JAPAN

Sharp Corporation
Electronic Components & Devices
22-22 Nagaike-cho, Abeno-Ku
Osaka 545-8522, Japan
Phone: (81) 6-6621-1221
Fax: (81) 6117-725300/6117-725301
www.sharp-world.com

HONG KONG

Sharp-Roxy (Hong Kong) Ltd.
Level 26, Tower 1, Kowloon Commerce Centre,
No. 51, Kwai Cheong Road, Kwai Chung,
New Territories, Hong Kong
Phone: (852) 28229311
Fax: (852) 28660779
www.sharp.com.hk
Shenzhen Representative Office:
Room 602-603, 6/F.,
International Chamber of Commerce Tower,
168 Fuhua Rd. 3, CBD,
Futian District, Shenzhen 518048,
Guangdong, P.R. China
Phone: (86) 755-88313505
Fax: (86) 755-88313515