

PREPARED BY : DATE	<b>SHARP</b> LIQUID CRYSTAL DISPLAY GROUP SHARP CORPORATION <b>SPECIFICATION</b>	SPEC No. LD-23602A
APPROVED BY : DATE		FILE No. LD-23602A
		ISSUE : 01-Jun-11
		PAGE : 21pages
		APPLICABLE GROUP DISPLAY DEVICE BUSINESS GROUP

REVISION : 1-Jun-11

DEVICE SPECIFICATION FOR  
**TFT-LCD Module**

MODEL No.

**LQ084S3LG03**

These parts have corresponded with the RoHS

CUSTOMER'S APPROVAL  
BY \_\_\_\_\_

BY  
J.Kawanishi  
GENERAL MANAGER  
ENGINEERING DEPARTMENT I  
LIQUID CRYSTAL DISPLAY DIVISION II  
DISPLAY DEVICE BUSINESS GROUP  
SHARP CORPORATION



## RECORDS OF REVISION

LQ084S3LG03

## - Contents -

No.		page
1	Application	1
2	Overview	2
3	Mechanical Specifications	2
4	Input Terminals	3
5	Absolute Maximum Ratings	6
6	Electrical Characteristics	7
7	Timing characteristics of input signals	9
8	Input Signals, Basic Display Colors and Gray Scale of Each Color	10
9	Optical Characteristics	11
10	Display quality	12
11	Handling Precautions	13
12	Packing form	14
13	Reliability test items	14
14	Others	15
15	Storage conditions	16
Fig.1	OUTLINE DIMENSIONS	17
Fig.2	PACKING FORM	18

## 1. Application

This specification applies to the color TFT-LCD module LQ084S3LG03.

This specification is the proprietary product of SHARP CORPORATION (SHARP) and include materials protected under copyright of SHARP. Do not reproduce or cause any third party to reproduce them in any form or by any means, electronic or mechanical, for any purpose, in whole or in part, without the express written permission of SHARP.

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 .

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, power supply circuit and a White-LED Backlight unit. Graphics and texts can be displayed on a 800×RGB×600dots panel with about 16 million colors by using LVDS (Low Voltage Differential Signaling) and supplying +3.3V DC supply voltages 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.

The maximum viewing angle is in the 12 o'clock direction.

The 6 o'clock direction is difficult to reverse the grayscale.

The LED driver circuit and the PWM circuit to drive the backlight are built into the module.

## 3. Mechanical technical literatures

Parameter	technical literatures	Unit
Display size	21(8.4inch) Diagonal	cm
Active area	170.4(H)×127.8(V)	mm
Pixel format	800(H)×600(V) (1pixel=R+G+B dot)	pixel
Aspect ratio	4:3	
Pixel pitch	0.213(H)×0.213(V)	mm
Pixel configuration	R,G,B vertical stripe	
Display mode	Normally white	
Unit outline dimensions *1	199.5(W)×154.0(H)×11.6(D)	mm
Mass	320 (Max.)	g
Surface treatment	Anti-glare and hard-coating 2H	

\*1.Note: excluding back light connector.

Outline dimensions are shown in Fig.1.

## 4. Input Terminals

### 4-1. TFT-LCD panel driving

CN1 (Interface signals and +3.3V power supply)

Corresponding connectors: DF19G-20S-1C (Hirose Electric Co., Ltd.)

DF19G-20S-1SD (Hirose Electric Co., Ltd.)

20230-020B-F (I-PEX)

(※)Please do not use it besides corresponding connector

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 (-)	【*4-1】
6	RxIN0+	LVDS receiver signal CH0 (+)	【*4-1】
7	GND	GND	
8	RxIN1-	LVDS receiver signal CH1 (-)	【*4-1】
9	RxIN1+	LVDS receiver signal CH1 (+)	【*4-1】
10	GND	GND	
11	RxIN2-	LVDS receiver signal CH2 (-)	【*4-1】
12	RxIN2+	LVDS receiver signal CH2 (+)	【*4-1】
13	GND	GND	
14	CK IN-	LVDS receiver signal CK (-)	【*4-1】
15	CK IN+	LVDS receiver signal CK (+)	【*4-1】
16	GND	GND	
17	RxIN3-	LVDS receiver signal CH3 (-)	【*4-1,4-5】
18	RxIN3+	LVDS receiver signal CH3 (+)	【*4-1,4-5】
19	REV	Horizontal/Vertical display mode select signal	【*4-3】
20	8/6Bit	8Bit/6Bit select terminal	【*4-4】

【\*4-1】Please refer to 4-2 and 7-2 for correspondence of RxIN $i$  ( $i=0,1,2,3$ ) and actual display-data.

【\*4-2】The shielding case is connected with GND-line in the module.

【\*4-3】 REV = LOW or OPEN

REV = HIGH



【\*4-4】terminal function table

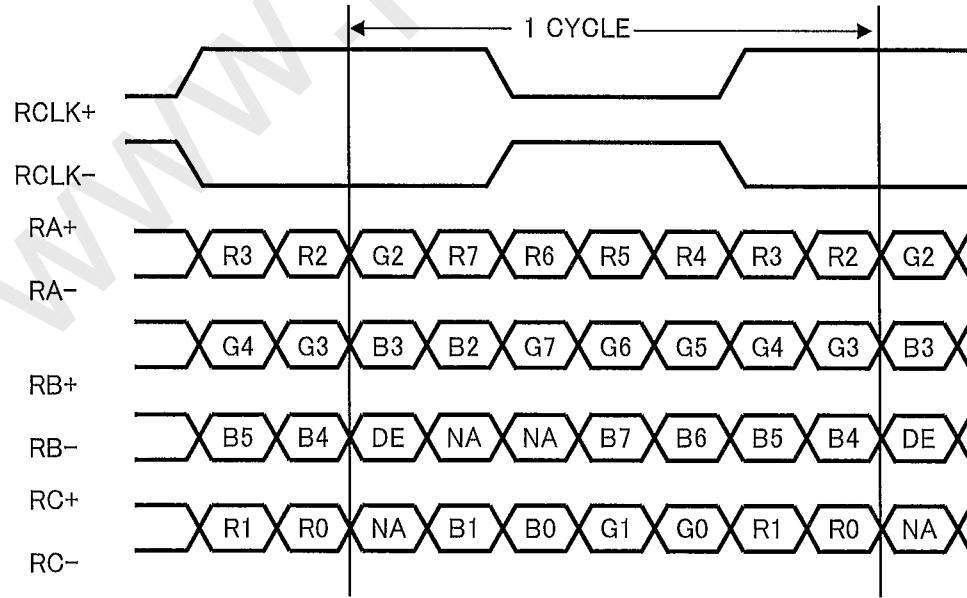
"H"	8Bit input mode
"L" or Open	6Bit input mode

【\*4-5】When use 6Bit input mode, please connects RxIN3+/- and GND-line.

## 4-2. Data Mapping

pin assignment ex) (THC63LVDM83R/D(Thine electronics) or Compatible product)

Transmitter		CN1 20Pin (8/6Bit)	
Pin No	Data	= "H" (8bit)	= "L" or Open (6bit)
51	TA0	R2	R2(LSB)
52	TA1	R3	R3
54	TA2	R4	R4
55	TA3	R5	R5
56	TA4	R6	R6
3	TA5	R7(MSB)	R7(MSB)
4	TA6	G2	G2(LSB)
6	TB0	G3	G3
7	TB1	G4	G4
11	TB2	G5	G5
12	TB3	G6	G6
14	TB4	G7 (MSB)	G7 (MSB)
15	TB5	B2	B2(LSB)
19	TB6	B3	B3
20	TC0	B4	B4
22	TC1	B5	B5
23	TC2	B6	B6
24	TC3	B7 (MSB)	B7 (MSB)
27	TC4	(NA)	(NA)
28	TC5	(NA)	(NA)
30	TC6	DE	DE
50	TD0	R0(LSB)	R0(GND)
2	TD1	R1	R1(GND)
8	TD2	G0(LSB)	G0(GND)
10	TD3	G1	G1(GND)
16	TD4	B0(LSB)	B0(GND)
18	TD5	B1	B1(GND)
25	TD6	(NA)	GND



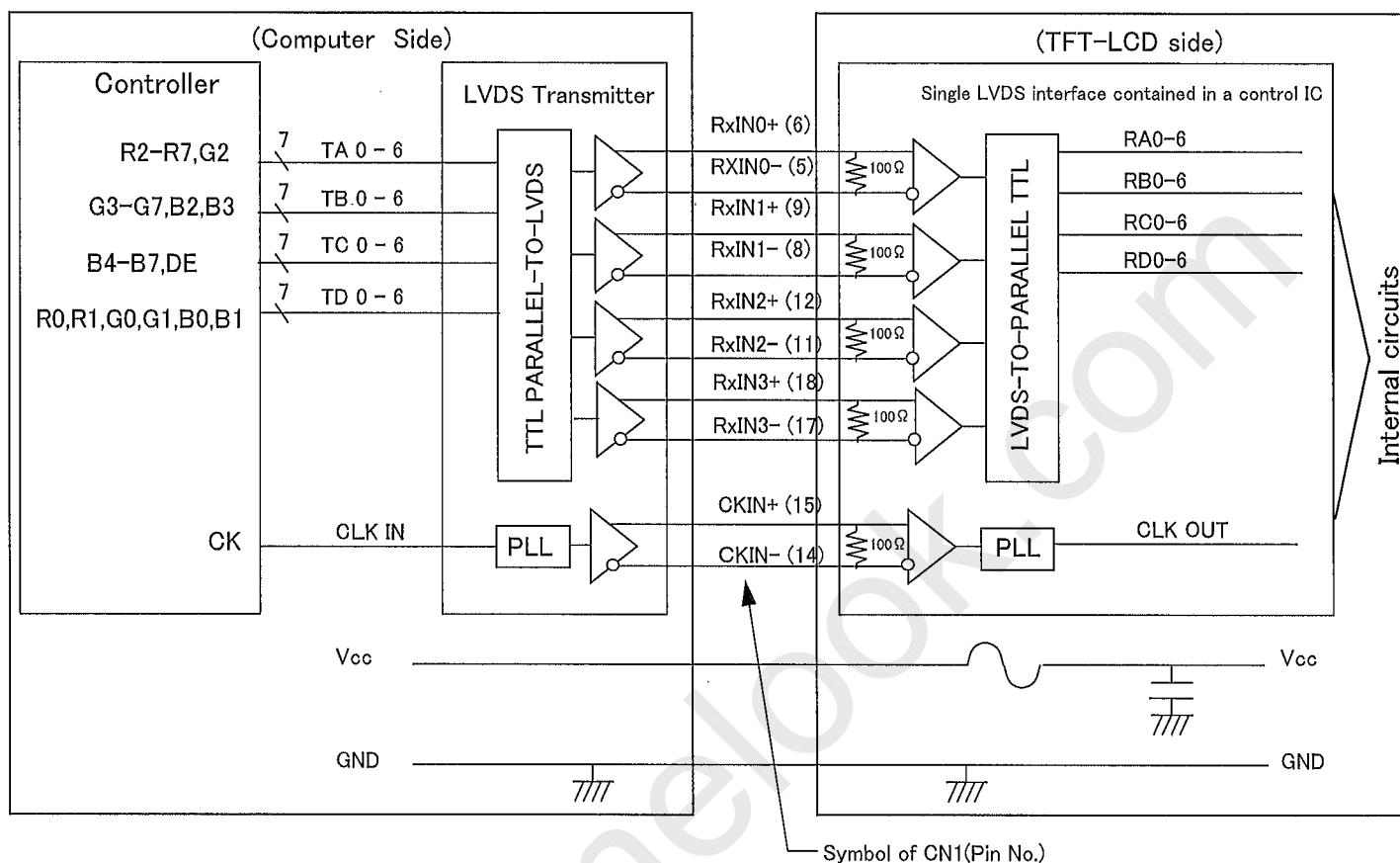
DE: Display Enable

NA: Not Available

### 4-3. Interface block diagram

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

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



\* When use 6Bit input mode, please connects RxIN3+/- and GND-line.

#### 4-4. LED backlight

LED backlight connector

CN2	Used connector	: SM06B-SRSS-TB(LF)(SN)	( J.S.T. Mfg. Co. Ltd )
	Corresponding connector	: SHR-06V-S-B	( J.S.T. Mfg. Co. Ltd )
		: SHR-06V-S	( J.S.T. Mfg. Co. Ltd )

Connector No.	Pin No.	Symbol	function
CN2	1	VLED	+12V power supply
	2	VLED	+12V power supply
	3	GND	GND
	4	GND	GND
	5	PWM	PWM signal
	6	Vst	LED output error signal[normal:5V, NG:0V]

#### 5. Absolute Maximum Ratings

Parameter	Symbol	Condition	Ratings	Unit	Remark
Supply voltage	V <sub>cc</sub>	T <sub>a</sub> =25°C	0 ~ +4.0	V	
	V <sub>LED</sub>	T <sub>a</sub> =25°C	-0.3 ~ +30.0	V	
Input voltage	V <sub>IN</sub>	T <sub>a</sub> =25°C	-0.3 ~ +V <sub>cc</sub> +0.3	V	【*5-1】
	V <sub>PWM</sub>	T <sub>a</sub> =25°C	-0.3 ~ +30.0	V	【*5-2】
Storage temperature	T <sub>stg</sub>	—	-30 ~ +75	°C	
Operating temperature	T <sub>ope</sub>	—	-30 ~ +75 (Panel surface [display area])	°C	【*5-3,5-4,5-6】

【\*5-1】 RxINi-/+(i=0,1,2), CK IN-/+, REV, 8/6Bit

【\*5-2】 PWM

【\*5-3】 Humidity:95%RH Max.( T<sub>a</sub>≤40°C ) Note static electricity.

Maximum wet-bulb temperature at 39°C or less. (T<sub>a</sub>>40°C) No condensation.

【\*5-4】 The operating temperature only guarantees operation of the circuit. For contrast, speed response, and other factors related to display quality, judgment is done using the ambient temperature T<sub>a</sub> = +25°C.

【\*5-5】 Use over the absolute maximum rating might affect reliability and might cause malfunction.

【\*5-6】 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 65~75°C.

## 6. Electrical Characteristics

### 6-1. TFT-LCD panel driving

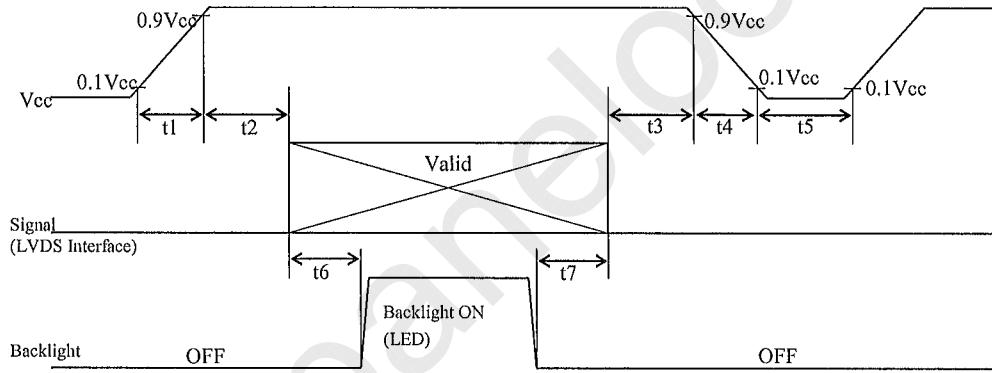
$T_a = +25^\circ\text{C}$

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Input voltage		$V_{CC}$	+3.0	+3.3	+3.6	V	【*6-3】
Current dissipation		$I_{CC}$	—	300	380	mA	【*6-4】
Permissive input ripple voltage		$V_{RP}$	—	—	100	$\text{mV}_{P-P}$	$V_{CC} = +3.3\text{V}$
Input voltage width for LVDS receiver		$V_I$	0	—	2.4	V	LVDS signal
Differential input	High	$V_{TH}$	—	—	+100	$\text{mV}$	$V_{CM} = +1.2\text{V}$ 【*6-1】
	Low	$V_{TL}$	-100	—	—	$\text{mV}$	
Input reak current (Hight)		$I_{OH1}$	—	—	$\pm 10$	$\mu\text{A}$	$V_I = +2.4\text{V}$ $V_{CC} = +3.6\text{V}$
		$I_{OH2}$	—	—	$\pm 500$	$\mu\text{A}$	
Input reak current (Low)		$I_{OL1}$	—	—	$\pm 10$	$\mu\text{A}$	$V_I = 0\text{V}$ $V_{CC} = +3.6\text{V}$
		$I_{OL2}$	—	—	$\pm 500$	$\mu\text{A}$	
Terminal resistor		$R_T$	—	100	—	$\Omega$	Differential input

【\*6-1】  $V_{CM}$  : LVDS common mode voltage

【\*6-2】 REV, 8/6bit

【\*6-3】 On-off conditions for supply voltage

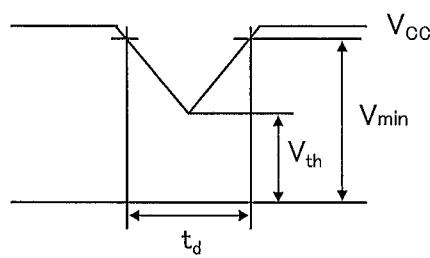


Symbol	Min.	Max.	Unit	Remark
t1	0	25	ms	
t2	0	100	ms	
t3	0	1	s	
t4	0	400	ms	
t5	200	—	ms	
t6	180	—	ms	*1
t7	5	—	ms	*1

\*1: As for the power sequence for backlight, it is recommended to apply above mentioned input timing. If the backlight is lit on and off at a timing other than shown above, displaying image may get disturbed. This is due to variation of output signal from timing generator when LVDS signal is changed from on to off or vice versa, but has no harm to the module itself.

【Note】Please do not put the input signal into the state of the High impedance for power ON period, and do not input the abnormal signal.

## Vcc-dip conditions



$$V_{th} = 2.5V$$

$$V_{min} = 3V$$

$$1) +2.5V \leq V_{cc} < +3.0V, t_d \leq 10ms$$

Under above condition, the display image should return to an appropriate figure after Vcc voltage recovers.

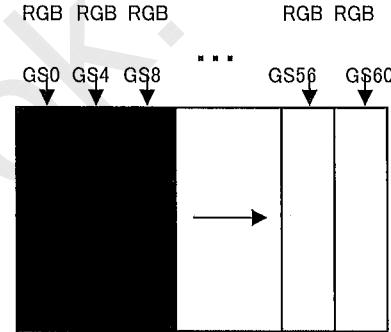
$$2) V_{cc} < +2.5V$$

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

## 【\*6-4】 Current dissipation

Typical current situation : 16-gray-scale-bar pattern  
( $V_{cc}=+3.3V$ , gray-scale: GS(4n) )

However, assume n to be a natural number from 0 to 15,  
and refer to Chapter 8 for gray scale of RGB.



Maximum current situation :  $V_{cc}=+3.0V$

## 6-2. LED backlight

$T_a = +25^\circ C$

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Supply voltage	$V_{LED}$	11.2	12.0	12.6	V	—
Current dissipation	$I_{LED}$	—	260	350	mA	$V_{LED}=12.0V$
Dimmer signal Low voltage	$V_{pwmL}$	—	—	0.8	V	$V_{LED}=12.0V$
Dimmer signal High voltage	$V_{pwmH}$	2.1	—	12	V	$V_{LED}=12.0V$
Dimmer frequency	$f_{pwm}$	50	120	1k	Hz	—
PWM Pulse width	$T_{pwmH}$	8	—	—	μs	High period
LED error detection signal (normal)	$V_{LEDOH}$	—	5.0	—	V	$V_{LED}=12.0V$
LED error detection signal (abnormal)	$V_{LEDOL}$	—	—	0.6	V	$V_{LED}=12.0V$
Life time	h	—	50,000	—	hours	【Reference】【*6-5】

【\*6-5】 Luminance becomes 50% of the original value under standard condition.

\* PWM

· Luminance changes in proportion to the duty ratio.

( $PWM=High:ON$   $PWM=Low:OFF$ )

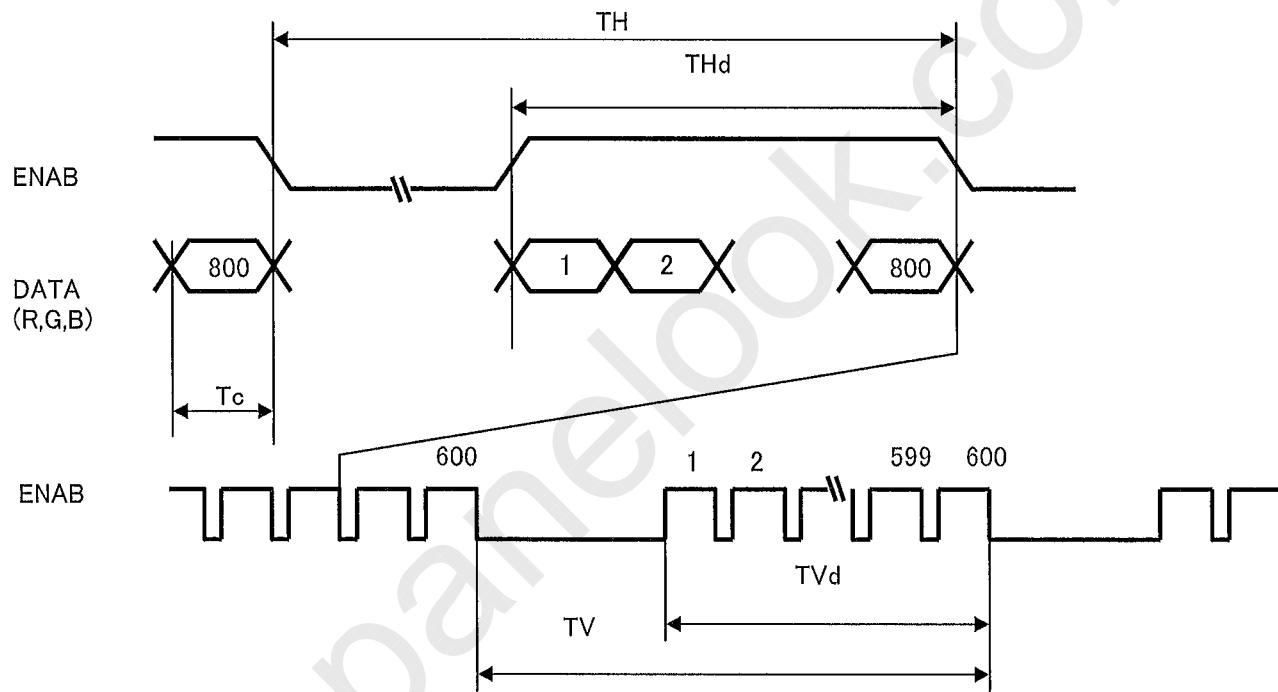
· Please do not put the PWM terminal into the state of floating (no input).

## 7. Timing characteristics of input signals

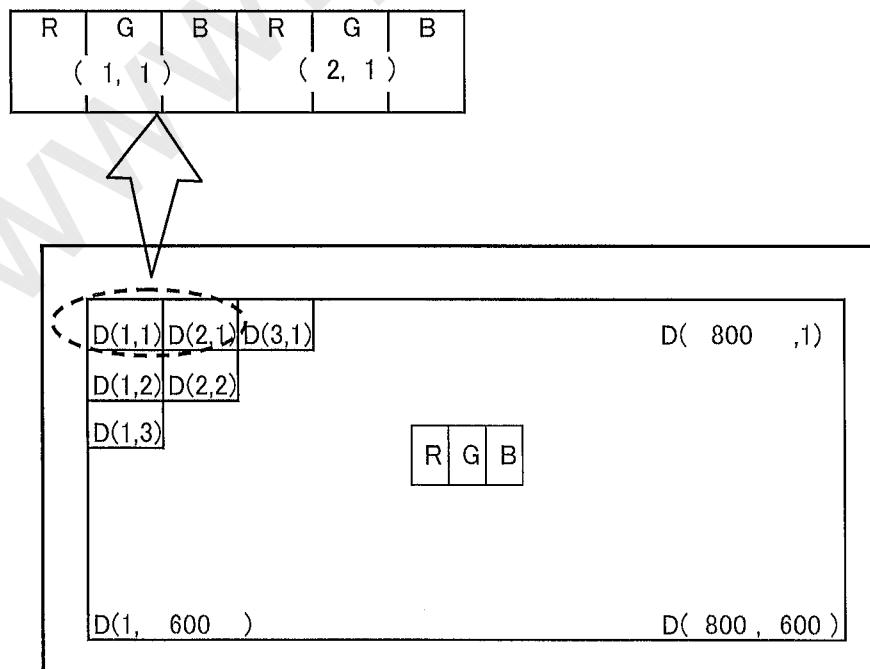
### 7-1. Timing characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Clock	Frequency	1/Tc	35.0	40	42.0	MHz
ENAB	Horizontal period	TH	832	1056	1395	clock
			20.8	26.4	39.9	μ s
	Horizontal period (High)	THd	800	800	800	clock
	Vertical Frequency	TV	628	666	798	line
			—	17.6	—	ms
	Vertical period (High)	TVd	600	600	600	line

【\*7-1】 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



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

Colors & Gray scale	Gray Scale	Data signal																								
		R0	R1	R2	R3	R4	R5	R6	R7	G0	G1	G2	G3	G4	G5	G6	G7	B0	B1	B2	B3	B4	B5	B6	B7	
Basic Color	Black	—	0	0	0	0	0	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	0	0	0	X	X	1	1	1	1	1	1	
	Green	—	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
	Cyan	—	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	X	X	1	1	1	1	1	1	
	Red	—	X	X	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Magenta	—	X	X	1	1	1	1	1	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	
	Yellow	—	X	X	1	1	1	1	1	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	
	White	—	X	X	1	1	1	1	1	X	X	1	1	1	1	1	1	X	X	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	0	0	0	0	0	
	↑	GS1	1	0	0	0	0	0	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	0	0	0	0	0	
	↑	↑	↑								↑								↑							
	↓	↓	↓								↓								↓							
	Brighter	GS250	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	↓	GS251	1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Gray Scale of Green	Red	GS252	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Black	GS0	0	0	0	0	0	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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Darker	GS2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
	↑	↑	↑								↑								↑							
	↓	↓	↓								↓								↓							
	Brighter	GS250	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	0	0	
Gray Scale of Blue	↓	GS251	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1	1	0	0	0	0	0	0	
	Green	GS252	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	
	Black	GS0	0	0	0	0	0	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	0	0	0	0	1	0	0	0	0	0	0	
	Darker	GS2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
	↑	↑	↑								↑								↑							
	↓	↓	↓								↓								↓							
Gray Scale of Blue	Brighter	GS250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1
	↓	GS251	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1
	Blue	GS252	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1

0 :Low level voltage    1 :High level voltage    X :Don't care

Each basic color can be displayed in 253 gray scales from 8 bit data signals. According to the combination of, total 24 bit data signals, the 16-million-color display can be achieved on the screen.

## 9. Optical Characteristics

Ta=+25°C, Vcc=+3.3V

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angle range	Horizontal	CR>10	50	65	-	Deg.	【*9-1,9-2,9-4】
	θ 11		45	60	-	Deg.	
	θ 12		40	55	-	Deg.	
Contrast ratio		optimized angle	300	450	-		【*9-2,9-4】
Response Time	White Black	$\tau_r + \tau_d$	-	35	-	ms	【*9-3,9-4】
Chromaticity of White	Wx	$\theta=0^\circ$	0.263	0.313	0.363		【*9-4】
	Wy		0.279	0.329	0.379		
Luminance of white		$Y_{L1}$	-	330	-	cd/m <sup>2</sup>	【*9-4】
White Uniformity		$\delta_w$	-	-	1.33		【*9-5】

※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.3 below.

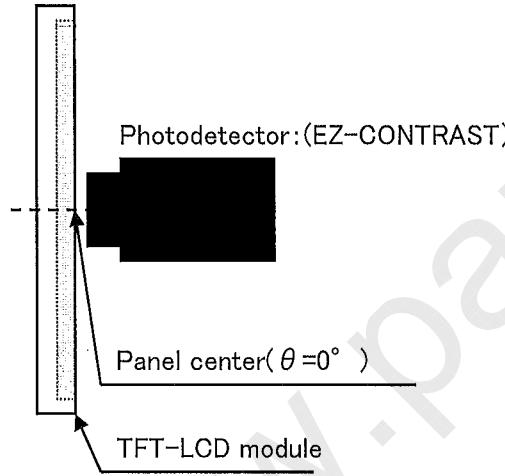


fig.3-1 Measuring method of Viewing angle range.

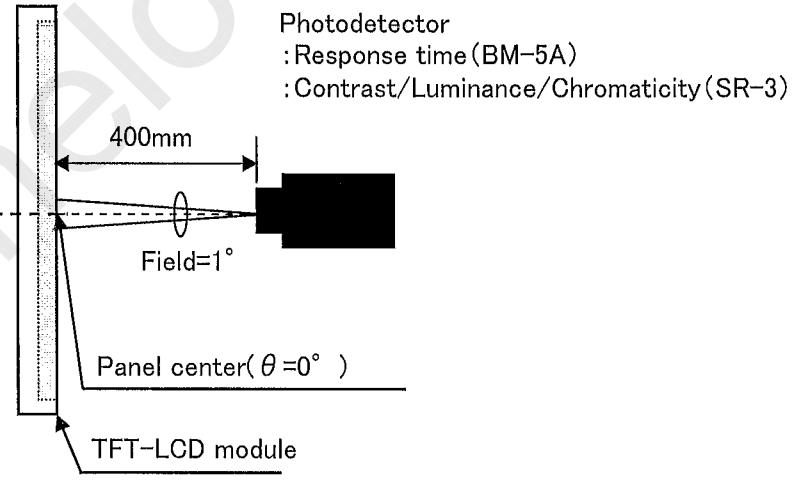
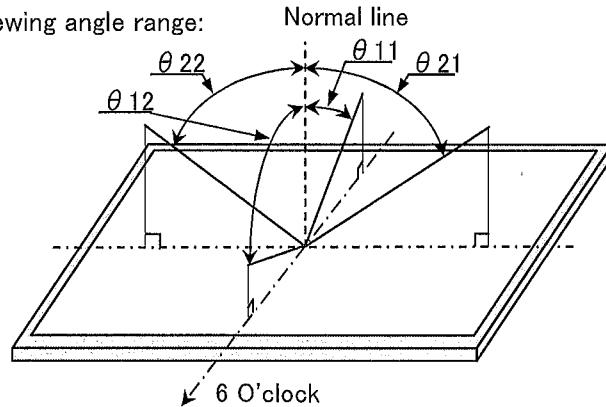


fig.3-2 Measuring method of contrast, luminance, response time, and Chromaticity.

Fig.3 Optical characteristics measurement method

【\*9-1】Definitions of viewing angle range:

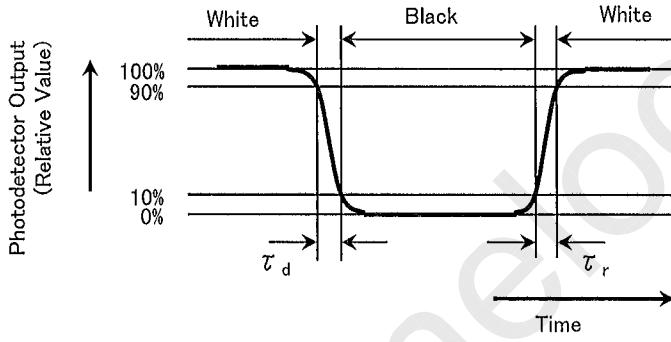


【\*9-2】Definition of contrast ratio:

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

【\*9-3】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".

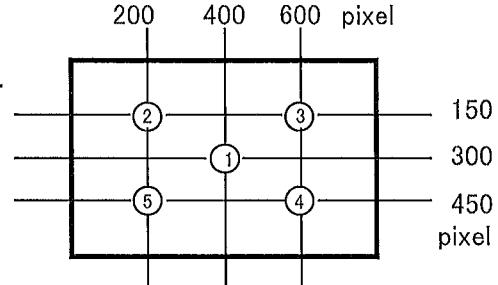


【\*9-4】This shall be measured at center of the screen.

【\*9-5】Definition of white uniformity:

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

$$\delta_w = \frac{\text{Maximum luminance of 5 points}(① \sim ⑤)}{\text{Minimum luminance of 5 points}(① \sim ⑤)}$$



## 10. Display quality

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

## 11. Handling Precautions

- a ) Be sure to turn off the power supply when inserting or disconnecting the cable.
- b ) Be sure to design the cabinet so that the module can be installed without any extra stress such as warp or twist.
- c ) Since the front polarizer is easily damaged, pay attention not to scratch it.
- d ) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- e ) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
- f ) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface. Handle with care.
- g ) Since CMOS LSI is used in this module, take care of static electricity and injure the human earth when handling. Observe all other precautionary requirements in handling components.
- h ) 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 flame of module to stabilize against EMI and external noise.
- m ) 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.
- n ) 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.
- o ) 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.
- p ) 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.
- q ) 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.
- r ) 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)
- s ) Be careful when using it for long time with fixed pattern display as it may cause accidental image. (Please use a screen saver etc., in order to avoid an afterimage.)
- t ) 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.
- u ) 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.
- v ) 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.

## 12. Packing form

- a) Piling number of cartons : MAX. 6
- b) Package quantity in one carton: 10pcs
- c) Carton size(TYP): 408mm(W) × 203mm(D) × 244mm(H)
- d) Total mass of one carton filled with full modules(10pcs): 4.5kg
- e) Packing form are shown in Fig 2.

## 13. Reliability test items

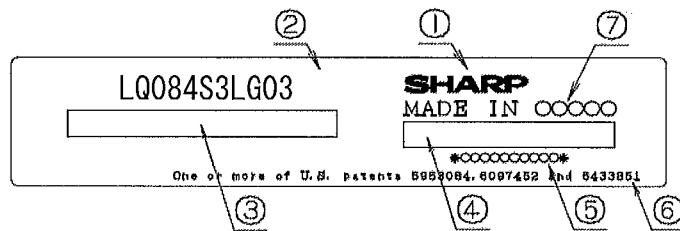
No.	Test item	Conditions
1	High temperature storage test	Ambient temperature +75°C 240H
2	Low temperature storage test	Ambient temperature -30°C 240H
3	High temperature & high humidity operation test	Ambient temperature 40°C, Humidity 95% RH 240H (No condensation.)
4	High temperature operation test	Panel surface 75°C 240H
5	Low temperature operation test	Ambient temperature -30°C 240H
6	Vibration test	<Sin wave> Frequency : 10~57Hz / Vibration width (one side) : 0.15mm : 57~500Hz / Gravity : 19.6m/s <sup>2</sup> Sweep time: 11minutes Test period : 3H(X, Y, Z direction 1H)
7	Shock test	Max. gravity : 490m/s <sup>2</sup> Pulse width: 11ms Direction: ±X, ±Y, ±Z Test period : 1time / 1direction
8	ESD test	Contact discharge (150pF 330Ω) non-operating = ±10kV, operating = ±8kV Atmospheric discharge (150pF 330Ω) non-operating = ±20kV, operating = ±15kV

【\*】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°C, Humidity:45~75%, Atmospheric pressure:86~106kpa)

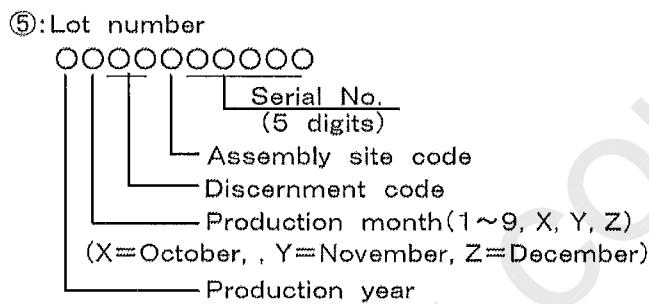
## 14. Others

### 14-1. Lot No Label:

The label that displays SHARP·Model No.( LQ084S3LG03)·Lot No. is stuck on the back of the module.

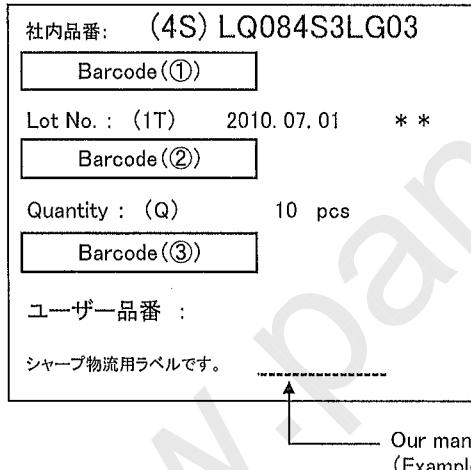


- ①:SHARP Logo
- ②:SHARP model number
- ③:Model number bar-code
- ④:Lot number bar-code
- ⑤:Lot number
- ⑥:Patent
- ⑦:Product area



### 14-2. Packing box Label:

The label that displays ①Model number( LQ084S3LG03) ②Lot number ③Quantity of module is stuck on the packing box. Moreover, the display of bar code also applies to this.



- ① Model number( LQ084S3LG03)
- ② Lot number (DATE)
- ③ Quantity of module

Our management product number might be filled  
(Example: LQ084S3LG03A 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.**

### 14-3. The ozone-depleting substances is not used.

### 14-4. If any problem occurs in relation to the description of this specification , it shall be resolved through discussion with spirit of cooperation.

## 15. 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.

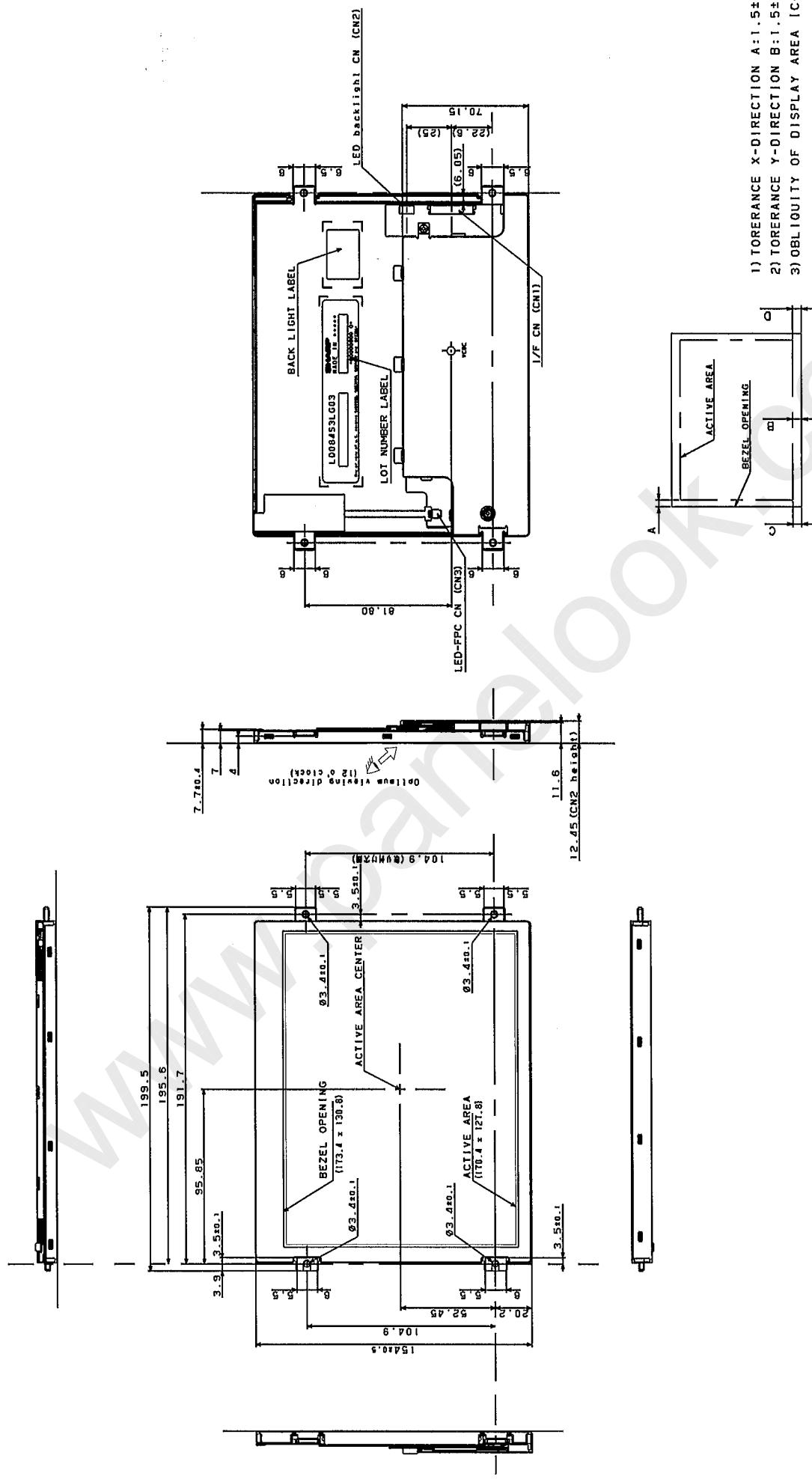
Do not place directly on the floor. In addition, to obtain moderate ventilation in between the pallet's top and bottom surfaces, pile the cartons up in a single direction and in order.

Please place the product cartons away from the storage wall.

Storage period

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

LD-23602A-17



NOTES:

- 1) UNSPECIFIED TOLERANCE TO BE  $\pm 0.5$
- 2) WARP AND FLOATING FOR PRINTED WIRING BOARD AND CHASSIS ARE EXCLUDED FROM THE THICKNESS OF THE UNIT
- 3) IGT INERTIAL TORQUE (RECOMMENDATION)

Fig. 1 : 1 G084S3 G03 CUTTING DIMENSIONS

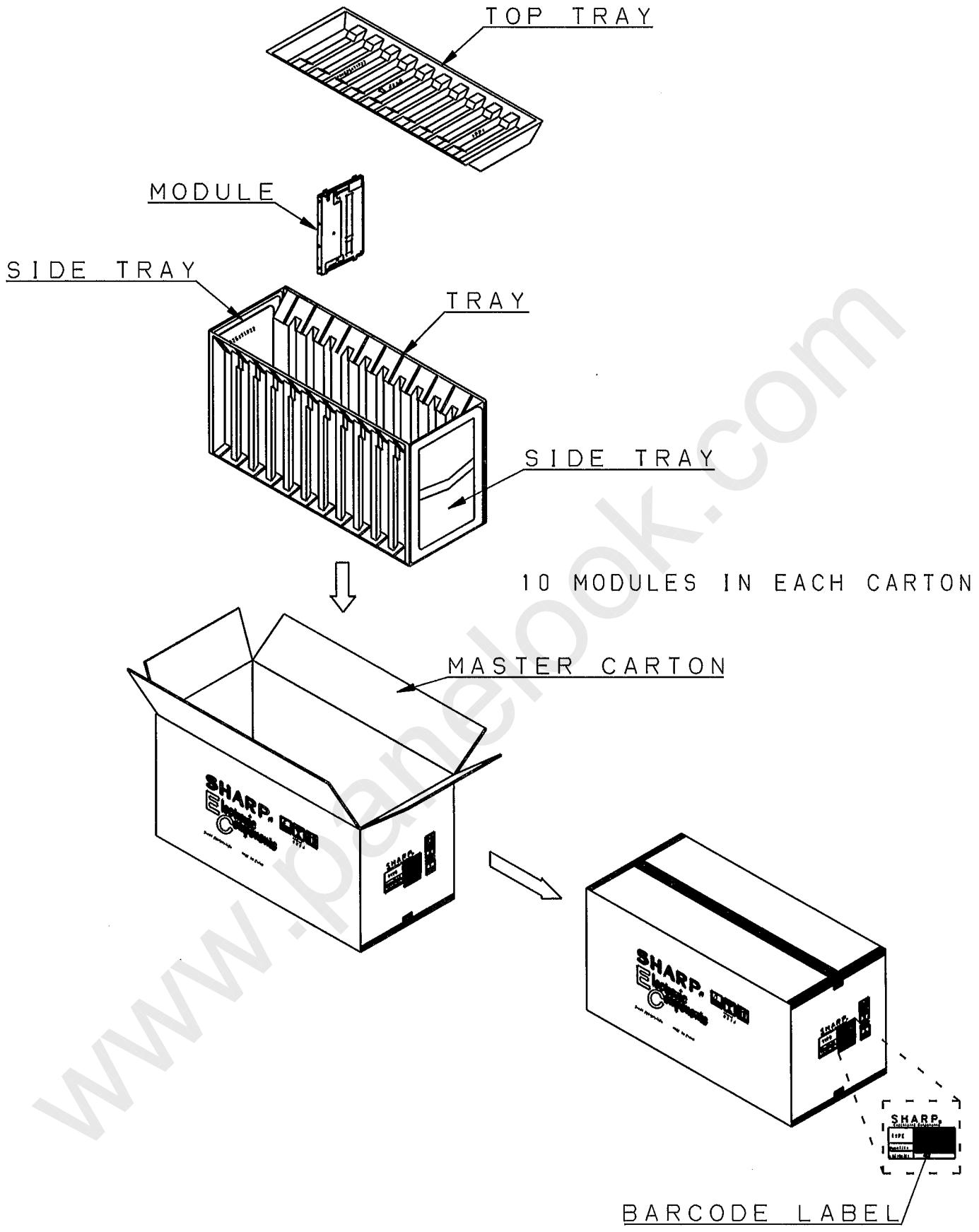


Fig.2 : PACKING FORM