

# **LQ283G1TW11**

## **TFT-LCD Module**

Spec. Issue Date: July 1, 2005

No: LD-13612D

PREPARED BY :    DATE	<h1>SHARP</h1> <p>MOBILE LIQUID CRYSTAL DISPLAY GROUP SHARP CORPORATION</p> <h2>SPECIFICATION</h2>	SPEC No. LD-13612D
		FILE No.
APPROVED BY :    DATE		ISSUE : Jul.01.2005
		PAGE : 20 pages
		APPLICABLE GROUP Mobile Liquid Crystal Display Group

DEVICE SPECIFICATION FOR  
**TFT-LCD Module**  
 MODEL No.  
**LQ283G1TW11**

CUSTOMER'S APPROVAL

DATE \_\_\_\_\_

BY \_\_\_\_\_

PRESENTED

BY *T. Naka*

T. Naka

Division deputy general manager of

Mobile LCD Design Center II

Engineering Department V

Mobile LCD Design Center II

Mobile Liquid Crystal Display Group

SHARP CORPORATION



## 1. Application 3

This specification applies to the color 28.3 QSXGA TFT-LCD module LQ283G1TW11.

These specification sheets are the proprietary product of SHARP CORPORATION("SHARP") and include materials protected under the 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.

In case of using the device for applications such as control and safety equipment for transportation(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 extremely high level of reliability, such as medical 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.

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). The wide vision can be realized in this module with SHARP original technology. It is composed of a color TFT-LCD panel, driver ICs, control circuit, power supply circuit and a back light unit. Graphics and texts can be displayed on a 2560 × 3 × 2048 dots panel with about 16.77 million colors (8 bit) by supplying 192 bit data signals(8bit × 2pixel × RGB × 4), one display enable signal, and one dot clock signal by TMDS, and +12V DC supply voltages for TFT-LCD panel driving and back light. The backlight inverter is built into this module.

## 3. Mechanical Specifications

Parameter	Specifications	Unit
Display size	71.8 (Diagonal)	cm
	28.3 (Diagonal)	Inch
Active area	560.64 (H) × 448.512 (V)	mm
Pixel format	2560 (H) × 2048 (V)	Pixel
	(1 pixel = R + G + B dots)	
Pixel pitch	0.219 (H) × 0.219 (V)	mm
Pixel configuration	R,G,B vertical stripe	
Display mode	Normally Black	
Unit outline dimensions *1	640 (W) × 530 (H) × 60(D)	mm
Mass	15 max	kg
Surface treatment	Anti-glare and hard-coating 2H	

2

\*1.Note: excluding back light cables.

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

Outline dimensions are shown in Fig.1.

## 4. Input Terminals and their function

### 4-1. Interface signals

CN1, CN2

Using connector : MDR 26Pin 10226-1A10JL (3M.)

Mating connector : MDR 26Pin 10126-6000EC (3M.)

Using TMDS receiver : SiI161 (Silicon Image co. Ltd)

Mating TMDS transmitter : SiI150,SiI154,SiI160,SiI164(Silicon Image co.Ltd)

CN1 2

Pin No.	Symbol	Function	Remark
1	B_RXC-	Negative ( - ) TMDS differential clock input (B port)	TMDS
2	B_RXC+	Positive ( + ) TMDS differential clock input (B port)	TMDS
3	B_RX0 SHIELD	GND	
4	B_RX1-	Negative ( - ) TMDS differential data input (B port)	TMDS
5	B_RX1+	Positive ( + ) TMDS differential data input (B port)	TMDS
6	B_RX2 SHIELD	GND	GND
7	SRDY	System(Graphic Board) Ready Input H: System Active L: System Inactive (Default)	EIA/TIA-562 Input 【Note】
8	A_RXC-	Negative ( - ) TMDS differential clock input (A port)	TMDS
9	A_RXC+	Positive ( + ) TMDS differential clock input (A port)	TMDS
10	A_RX0 SHIELD	GND	GND
11	A_RX1-	Negative ( - ) TMDS differential data input (A port)	TMDS
12	A_RX1+	Positive ( + ) TMDS differential data input (A port)	TMDS
13	A_RX2 SHIELD	GND	GND
14	B_RXC SHIELD	GND	GND
15	B_RX0-	Negative ( - ) TMDS differential data input (B port)	TMDS
16	B_RX0+	Positive ( + ) TMDS differential data input (B port)	TMDS
17	B_RX1 SHIELD	GND	GND
18	B_RX2-	Negative ( - ) TMDS differential data input (B port)	TMDS
19	B_RX2+	Positive ( + ) TMDS differential data input (B port)	TMDS
20	PRDY	Panel (TFT LCD) Ready Output H: TFT LCD Active L: TFT LCD Inactive (Default)	EIA/TIA-562 Output 【Note】
21	A_RXC SHIELD	GND	GND
22	A_RX0-	Negative ( - ) TMDS differential data input (A port)	TMDS
23	A_RX0+	Positive ( + ) TMDS differential data input (A port)	TMDS
24	A_RX1 SHIELD	GND	GND
25	A_RX2-	Negative ( - ) TMDS differential data input (A port)	TMDS
26	A_RX2+	Positive ( + ) TMDS differential data input (A port)	TMDS

CN2 2

Pin No.	Symbol	Function	Remark
1	D_RXC-	Negative ( - ) TMDS differential clock input (D port)	TMDS
2	D_RXC+	Positive ( + ) TMDS differential clock input (D port)	TMDS
3	D_RX0 SHIELD	GND	GND
4	D_RX1-	Negative ( - ) TMDS differential data input (D port)	TMDS
5	D_RX1+	Positive ( + ) TMDS differential data input (D port)	TMDS
6	D_RX2 SHIELD	GND	GND
7	BLON	Backlight “ON” signal H: System Active L: System Inactive (Default)	EIA/TIA-562 Input 【Note】
8	C_RXC-	Negative ( - ) TMDS differential clock input (C port)	TMDS
9	C_RXC+	Positive ( + ) TMDS differential clock input (C port)	TMDS
10	C_RX0 SHIELD	GND	GND
11	C_RX1-	Negative ( - ) TMDS differential data input (C port)	TMDS
12	C_RX1+	Positive ( + ) TMDS differential data input (C port)	TMDS
13	C_RX2 SHIELD	GND	GND
14	D_RXC SHIELD	GND	GND
15	D_RX0-	Negative ( - ) TMDS differential data input (D port)	TMDS
16	D_RX0+	Positive ( + ) TMDS differential data input (D port)	TMDS
17	D_RX1 SHIELD	GND	GND
18	D_RX2-	Negative ( - ) TMDS differential data input (D port)	TMDS
19	D_RX2+	Positive ( + ) TMDS differential data input (D port)	TMDS
20	PDR	Panel (TFT LCD) Ready Output H: vertical (Turn into vertical position) L: horizontal (Default)	EIA/TIA-562 Output
21	C_RXC SHIELD	GND	GND
22	C_RX0-	Negative ( - ) TMDS differential data input (C port)	TMDS
23	C_RX0+	Positive ( + ) TMDS differential data input (C port)	TMDS
24	C_RX1 SHIELD	GND	GND
25	C_RX2-	Negative ( - ) TMDS differential data input (C port)	TMDS
26	C_RX2+	Positive ( + ) TMDS differential data input (C port)	TMDS

【Note】 PRDY,SRDY,BLON Sequence

PRDY ( Panel ready output)“H”    SRDY(System ready input) “H”    BLON(Backlight on signal) “H”

## 4-2 Power supply for the TFT LCD.

### CN3

Using connector : RP13A-12RC-20PB (HIROSE ELECTRIC CO.LTD.)  
 Mating connector : RP13A-12PS-20SC (HIROSE ELECTRIC CO.LTD.) 1

### CN3

Pin No	Symbol	Function	Remark
1	B/L12V	Inverter power supply for Backlight (DC12V)	
2	B/L12V	Inverter power supply for Backlight (DC12V)	
3	B/L12V	Inverter power supply for Backlight (DC12V)	
4	B/L12V	Inverter power supply for Backlight (DC12V)	
5	B/L12V	Inverter power supply for Backlight (DC12V)	
6	B/L12V	Inverter power supply for Backlight (DC12V)	
7	B/L12V	Inverter power supply for Backlight (DC12V)	
8	B/L12V	Inverter power supply for Backlight (DC12V)	
9	B/LGND	Inverter GND for Backlight	
10	B/LGND	Inverter GND for Backlight	
11	B/LGND	Inverter GND for Backlight	
12	B/LGND	Inverter GND for Backlight	
13	B/LGND	Inverter GND for Backlight	
14	B/LGND	Inverter GND for Backlight	
15	B/LGND	Inverter GND for Backlight	
16	B/LGND	Inverter GND for Backlight	
17	GND	GND	
18	GND	GND	
19	VCC12V	+12V Power supply	
20	VCC12V	+12V Power supply	

## 4-3. Adjustment of Luminance

### CN4

Using connector : S5B-PH-SM3-TB(J.S.T. Co. Ltd.)  
 Mating connector : PHR-5(J.S.T. Co. Ltd.)

Pin No.	Symbol	Function	Remarks
1	5.0V	Output terminal for output voltage to supply adjusted voltage, Vbr.	
2	Vbr	Dimmer voltage input	
3	Vst	Alarm output of backlight lamp	<b>【Note】</b>
4	GND	GND	
5	GND	GND	

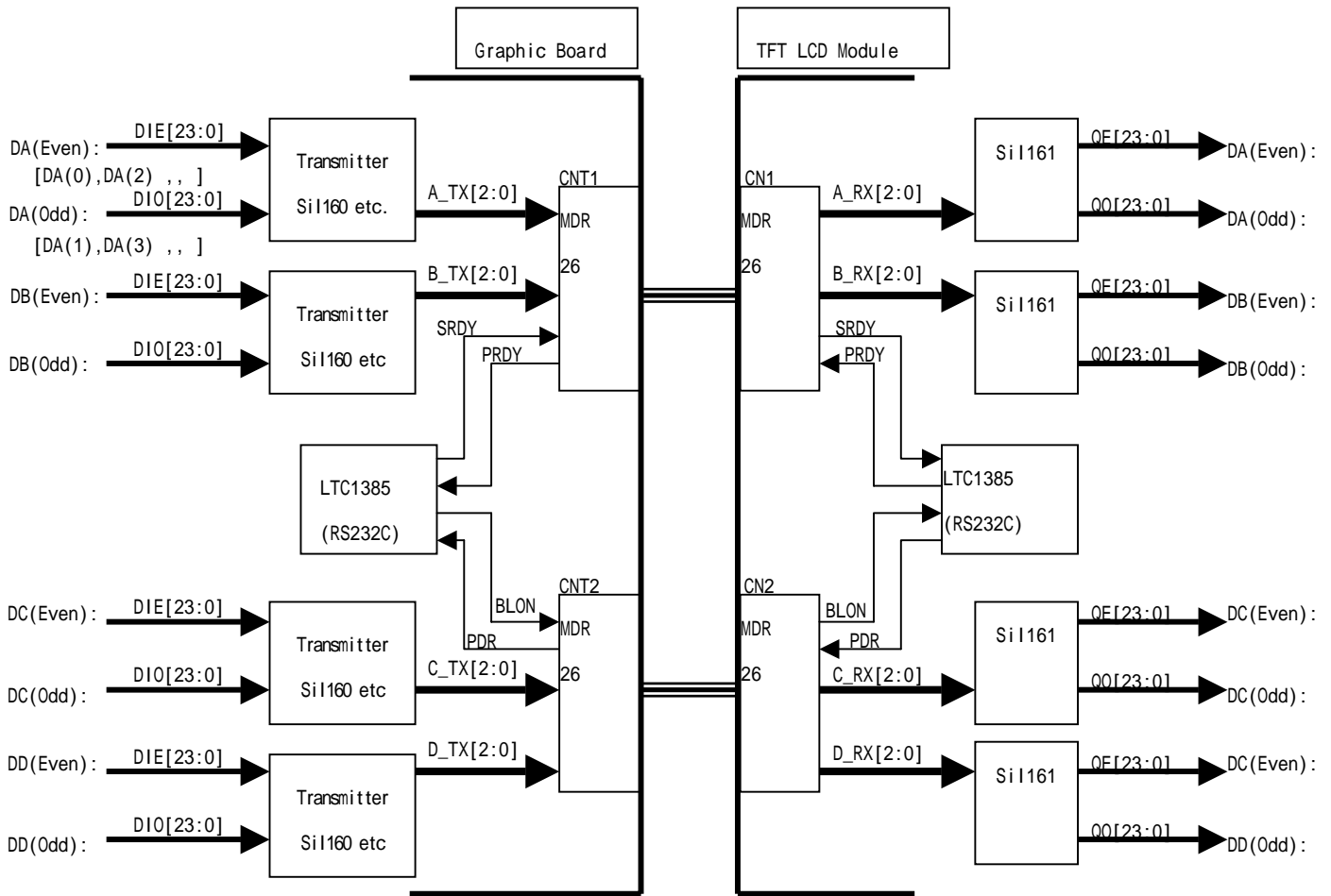
**【Note】** It is the alarm output terminal under abnormal backlight condition. High voltage output(5.0V) is produced when a lamp is burned out and/or a lamp connector is opened in one place or more.

(But this signal can't specify an abnormal spot.)

Normal condition : Vst level is LOW.(GND)

Abnormal condition : Vst level is HIGH.(5.0V)

## Interface Block



The table below shows the pin allocation of the pixel data and Panel Link.

the pixel Data	transmitter	receiver
Even B[7:0]	DIE[7:0]	QE[7:0]
Even G[7:0]	DIE[15:8]	QE[15:8]
Even R[7:0]	DIE[23:16]	QE[23:16]
Odd B[7:0]	DIO[7:0]	QO[7:0]
Odd G[7:0]	DIO[15:8]	QO[15:8]
Odd R[7:0]	DIO[23:16]	QO[23:16]

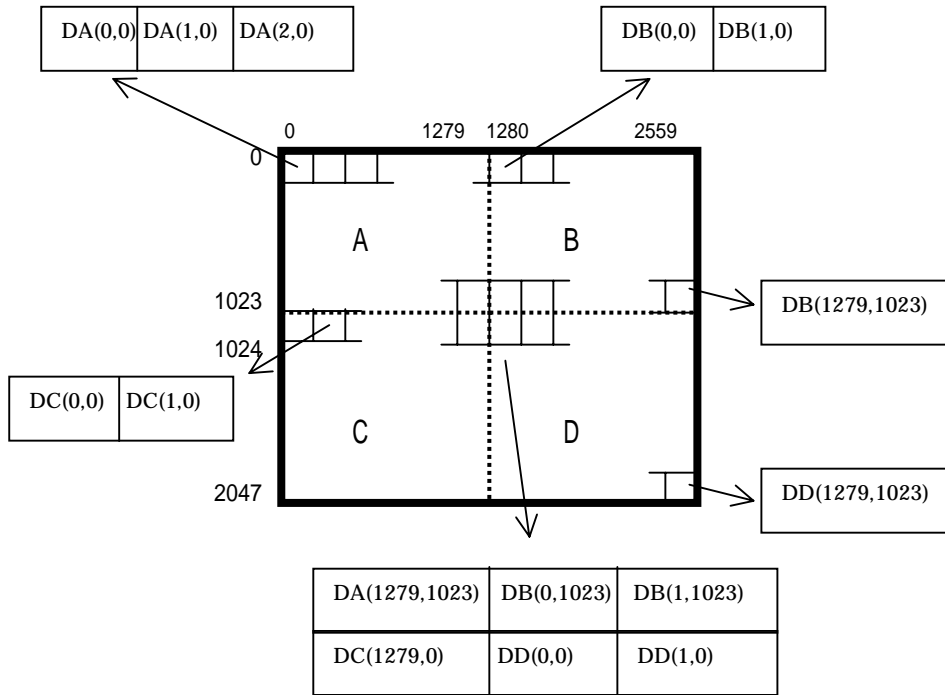
Note: B[7:0] = DIE[7:0]      B7 = DIE7, B6 = DIE6, ..., B1 = DIE1, B0 = DIE0

MSB:B7, LSB:B0

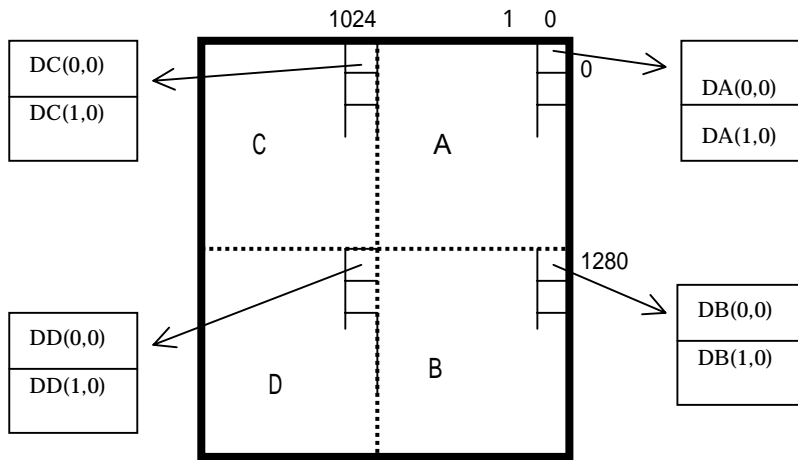
R and G are similar.

Relation between screen and pixel data

1 . Horizontal (default) position ( PDR = L )



2 . Turn to vertical position ( PDR = H )



PDR switch is located near close to CN in the backside of TFT module, as shown “SW” in Fig.1. It is normally set at “L” side.

## 5. Absolute Maximum Ratings

### 5-1. Module

Parameter	Symbol	Condition	Ratings	Unit	Remark
Storage temperature	Tstg	-	- 25 ~ + 60		【Note1】
Operating temperature (Ambient)	Topa	-	0 ~ + 40		

【Note1】 Humidity : 95%RH Max. ( Ta 40 )

Be careful for electrostatic build up, but no condensation.

In case of using the module mounted in package, inner temperature should be +10 or less from ambient temperature.

### 5-2. TFT-LCD panel and backlight driving

Parameter	Symbol	Condition	Ratings	Unit	Remark
12V power supply voltage	Vcc_12V B/L_12V	Ta=25	0 ~ +14.0V	V	

## 6. Electrical Characteristics

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

Ta = 25

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
+12V Power Supply	Input voltage	Vcc 12V	11.4	12.0	12.6	V	【Note1】
	Consumption	Icc	-	1.50	2.15	A	【Note2】
Allowable input ripple voltage		V <sub>RF</sub>	-	-	100	mV <sub>p-p</sub>	
Differential input voltage		V <sub>ID</sub>	75	-	1000	mV	
Input leak current		I <sub>O</sub>	-10		10	μA	

2

### 6-2. Backlight driving

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
+12V Power Supply	Input voltage	B/L 12V	11.4	12.0	12.6	V	
	Consumption	Icc	-	7.10	12.9	A	
Allowable input ripple voltage		V <sub>RF</sub>	-	-	100	mV <sub>p-p</sub>	

2

### 6-3. Adjustment part of Luminance

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark	
+5V output	Output voltage	Vout	4.9	5.0	5.1	V	【Note3】	
	Output current	Iout			20		2	
Adjusted voltage	Input voltage	Vbr	0.76	-	2.86	V		
	Input current	Ibr			(1)	mA		
Lamp life time		T <sub>l</sub>	50000	-	-	hour	【Note4】	
Alarm output	High voltage	VstH	IstH=20 μA	4.9	Vout	-	V	Unusual
			IstH=2.6mA	4.6	4.8	Vout	V	
	Low voltage	VstL	IstL= 20 μA		0	0.08	V	Usual
			IstL=-2.6mA		0.15	0.22	V	
Maximum output current		Ist	-	-	10	mA		

#### 【Note1】

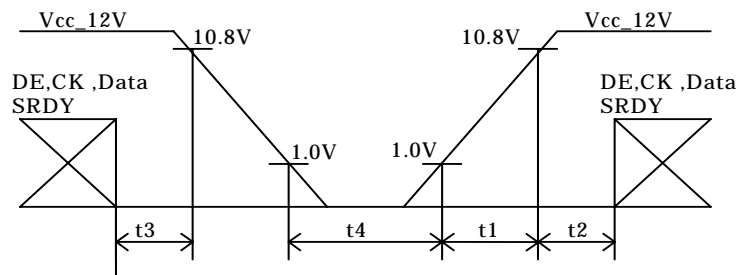
#### 1) Sequence between Vcc\_12V and data

$$0 < t1 \quad 60\text{ms}$$

$$0 < t2 \quad 10\text{ms}$$

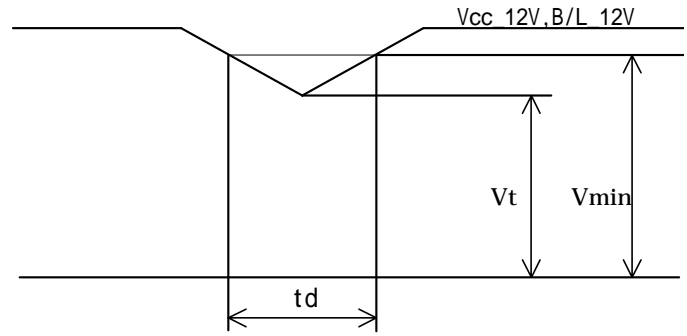
$$0 < t3 \quad 1\text{s}$$

$$t4 \quad 100\text{ms}$$



2) Voltage sag

Vcc(Vcc\_12V,B/L\_12V):  
 Vmin =11.4V , Vth =9.6V  
 . Vth Vcc < Vmin :  
 td 20ms  
 . Vcc < Vth :  
 Refer to \*1

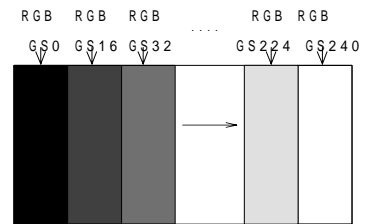


\*1 When Vcc(Vcc\_12V,B/L\_12V) goes down to Vth level and below, the module stops operating. Please follow the sequence mentioned in 1) and turn on power supply again.

【Note2】 Measurement pattern of amperage

1 ) Typical power consumption situation: 16 gray-bar pattern  
 Gray scale: GS(16N)  
 N=0 ~ 15

Explanation of each gray scale, GS(16n) is described below section 8.



【Note3】 Relation between Adjusted voltage Vbr and Display brightness

1	Adjusted voltage ( Vbr )	Max (2.86V).	↔	Min (0.76V).
2	Display brightness	Max. (Dimmer: Max)	↔	Min. (Dimmer: Min)

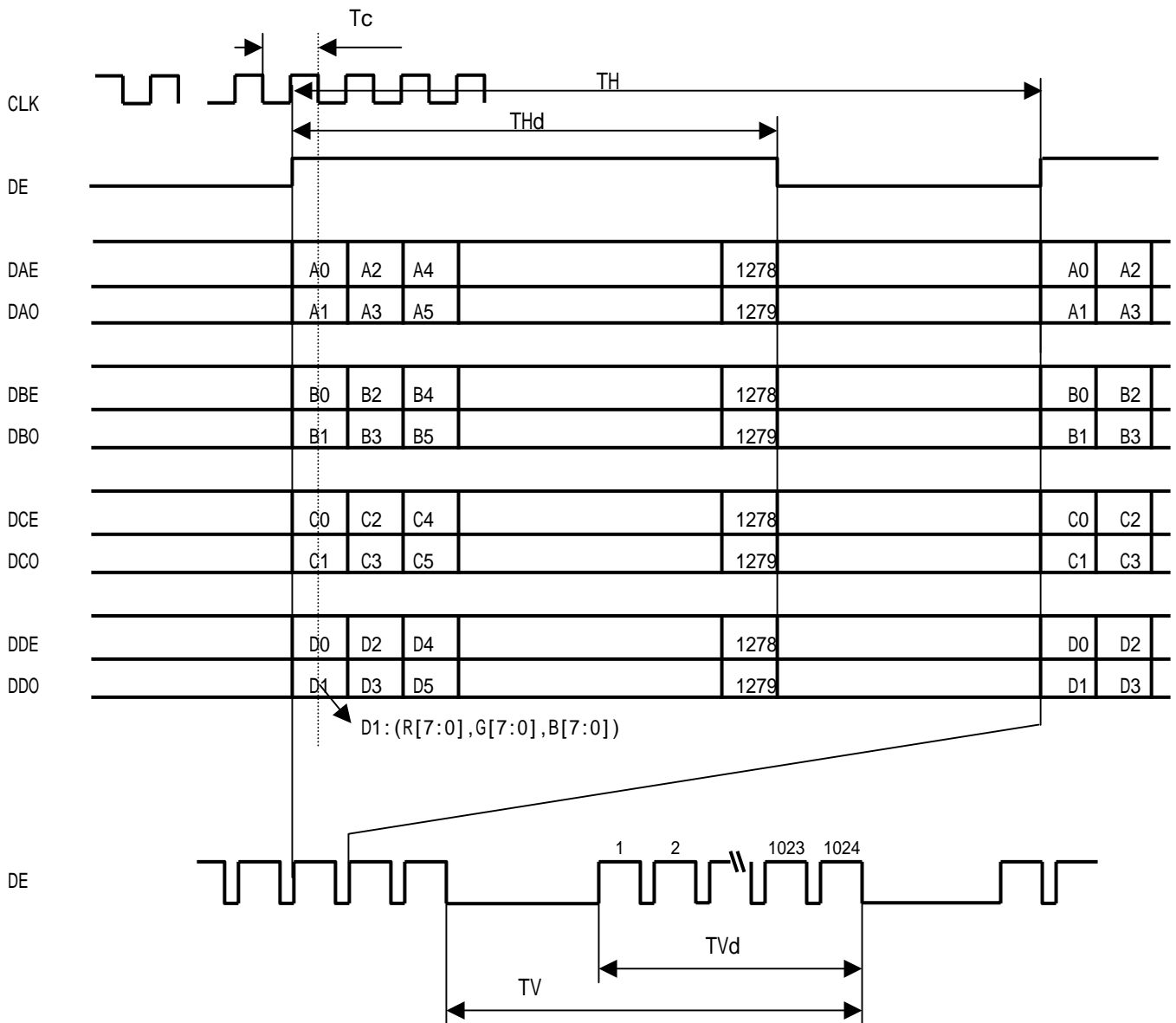
【Note4】 Lamp life time is defined as the time when brightness becomes 50% of the original value under the condition of Ta=25 and brightness dimmer maximum.

## 7. Timing characteristics of input signals

1 3

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Clock	Frequency	1/Tc	50	52.1	55	MHz	
DE (Data enable signal)	Horizontal period	TH	700	704	928	Clock	
			12.9	13.5	16.2	μs	
	Horizontal period (High)	THd	640	640	640	clock	
	Vertical period	TV	1026	1028	1080	line	【Note1】
			60	72	75	Hz	
Vertical period (High)	TVd	1024	1024	1024	line		

【Note1】 In case of using the long vertical period of DE, the deterioration of display quality such as flicker etc may occur.



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

Colors & Gray scale	Data signal																											
	Gray	RA0 RA1 RA2 RA3 RA4 RA5 RA6 RA7	GA0 GA1 GA2 GA3 GA4 GA5 GA6 GA7	BA0 BA1 BA2 BA3 BA4 BA5 BA6 BA7																								
Scale	RB0 RB1 RB2 RB3 RB4 RB5 RB6 RB7	GB0 GB1 GB2 GB3 GB4 GB5 GB6 GB7	BB0 BB1 BB2 BB3 BB4 BB5 BB6 BB7																									
	RC0 RC1 RC2 RC3 RC4 RC5 RC6 RC7	GC0 GC1 GC2 GC3 GC4 GC5 GC6 GC7	BC0 BC1 BC2 BC3 BC4 BC5 BC6 BC7																									
	RD0 RD1 RD2 RD3 RD4 RD5 RD6 RD7	GD0 GD1 GD2 GD3 GD4 GD5 GD6 GD7	BD0 BD1 BD2 BD3 BD4 BD5 BD6 BD7																									
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 0																							
	Blue	-	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1																							
	Green	-	0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0																							
	Cyan	-	0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1																							
	Red	-	1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0																							
	Magenta	-	1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1																							
	Yellow	-	1 1 1 1 1 1 1 1	1 1 1 1 1 1 1 1	0 0 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 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 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 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 0																							
	↑	↓																										
	↓	↓																										
	Brighter	GS253	1 0 1 1 1 1 1 1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0																							
	↓	GS254	0 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0																							
	Red	GS255	1 1 1 1 1 1 1 1	0 0 0 0 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 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 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 0																							
	↑	↓																										
	↓	↓																										
	Brighter	GS253	0 0 0 0 0 0 0 0	1 0 1 1 1 1 1 1	0 0 0 0 0 0 0 0																							
	↓	GS254	0 0 0 0 0 0 0 0	0 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0																							
	Green	GS255	0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1	0 0 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 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 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 0																							
	↑	↓																										
	↓	↓																										
	Brighter	GS253	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	1 0 1 1 1 1 1 1																							
	↓	GS254	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 1 1 1 1 1 1 1																							
	Blue	GS255	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	1 1 1 1 1 1 1 1																							

0 : Low level voltage, 1 : High level voltage.

Each basic color can be displayed in 256 gray scales from 8 bit data signals. According to the combination of total 192 bit data signals, the 16.7-million-color display can be achieved on the screen.

## 9. Optical Characteristics

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle Range	Vertical	11	CR 10	70	85	-	Deg.	【Note 1,4】
		12		70	85	-	Deg.	
	Horizontal	21, 22		70	85	-	Deg.	
Contrast ratio		C R	= 0 °	-	400	-	-	【Note 2,4】
Response Time	Rise	r	= 0 °	-	20	-	m s	【Note 3,4】
	Decay	d		-	5	-	m s	
Chromaticity of White	Wx	Wy	= 0 °	0.283	0.313	0.343	-	【Note 4】
	0.299			0.329	0.359	-		
Chromaticity of Red	Rx	Ry	= 0 °	0.577	0.607	0.637	-	【Note 4】
	0.309			0.339	0.369	-		
Chromaticity of Green	Gx	Gy	= 0 °	0.257	0.287	0.317	-	【Note 4】
	0.567			0.597	0.627	-		
Chromaticity of Blue	Bx	By	= 0 °	0.115	0.145	0.175	-	【Note 4】
	0.057			0.087	0.117	-		
Luminance of White	Y <sub>L</sub>		= 0 ° (Max.)	180	225	-	cd/m <sup>2</sup>	【Note 4】
			= 0 ° (Min.)	-	22.5	-		
White Uniformity		w	= 0 °	-	-	1.25	-	【Note 5】

2

2

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

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

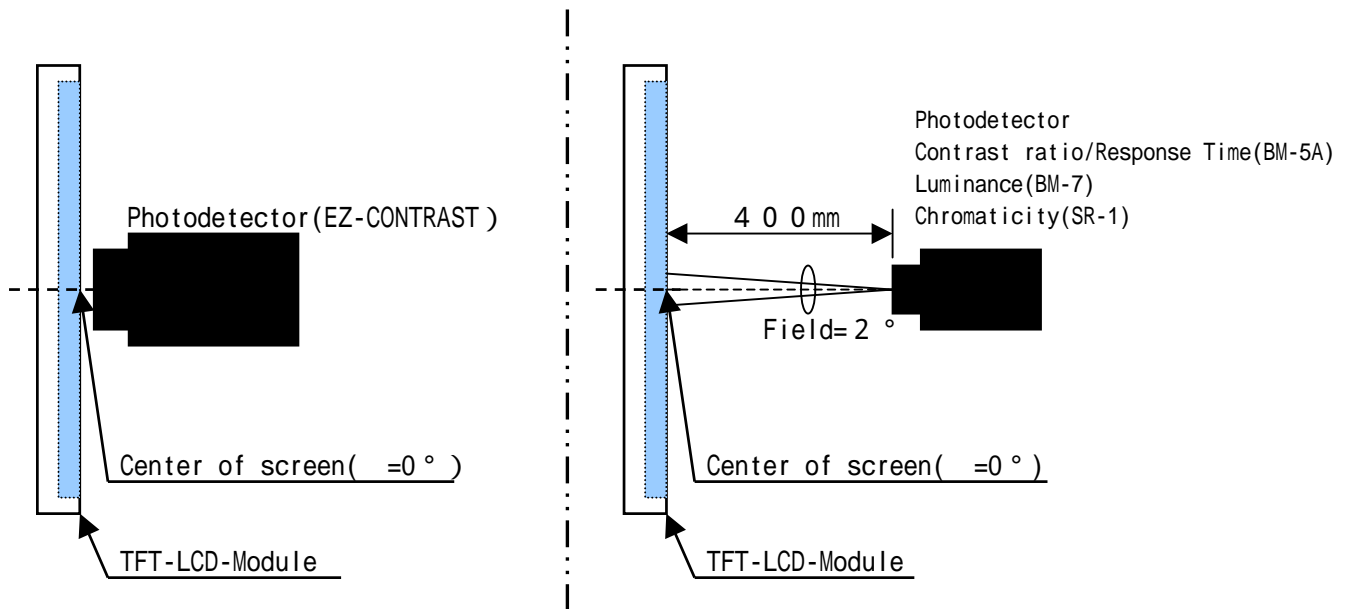
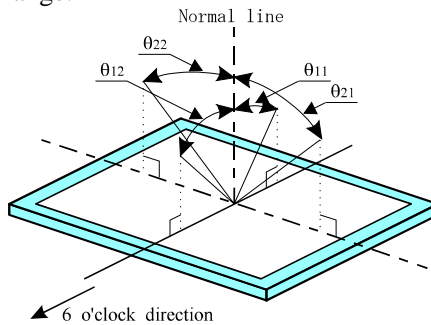


Fig2-1 Viewing angle measurement method

Fig2-2 Luminance/Contrast ratio/Response time/Chromaticity measurement method

Fig2 Optical characteristics measurement method

【Note1】 Definitions of viewing angle range:



【Note2】 Definition of contrast ratio:

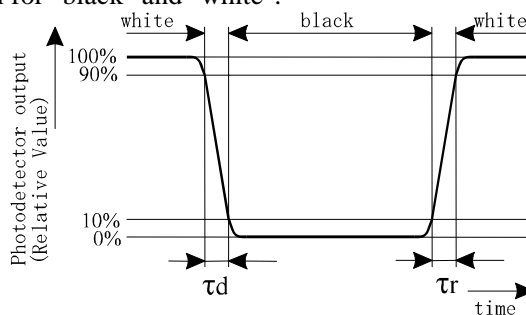
The contrast ratio is defined as the following.

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

【Note3】 Definition of response

time:

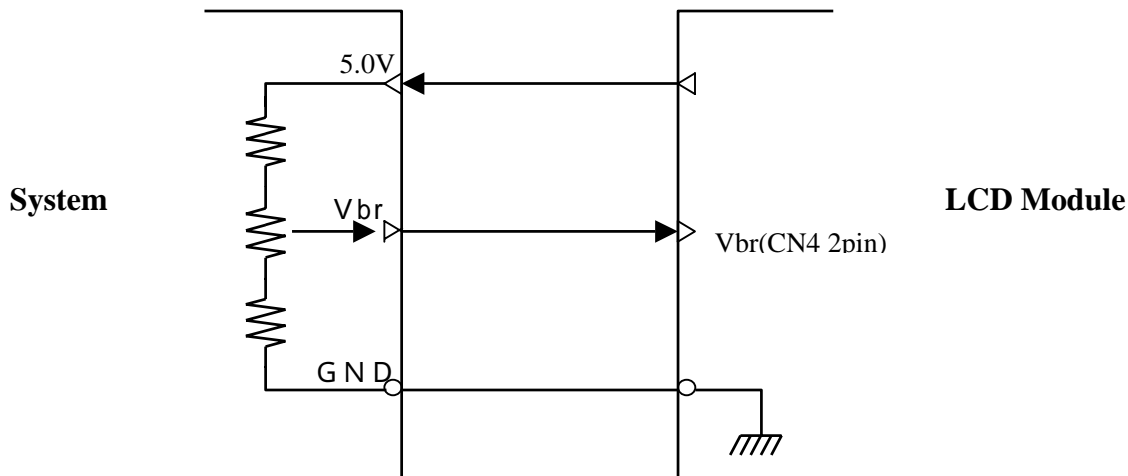
The response time is defined as the following figure and shall be measured by switching the input signal for "black" and "white".



【Note4】 This shall be measured at center of the screen.

Luminance adjustment circuit in the measurement is shown in the bottom figure.

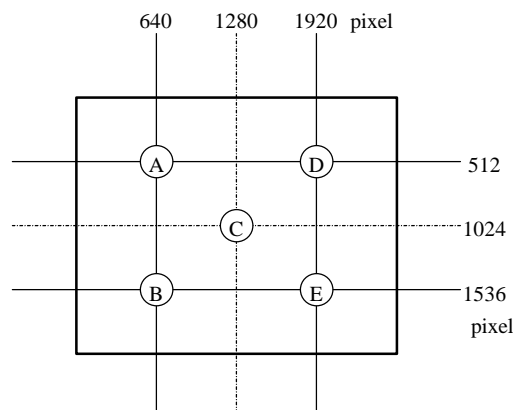
2



【Note5】 Definition of white uniformity:

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

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



## 10. Handling Precautions

- a) Be sure to turn off the power supply when inserting or disconnecting the cable from the input connector.
- 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 for handling.
- d) The adhesion of water to the module may cause discoloration or spots, wipe it off immediately.
- e) In case the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
- f) Since the panel is made of fine wires on 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 take the human earth into consideration when handling.
- h) Make sure the four mounting holes of the module are grounded sufficiently. Take electro-magnetic interference (EMI) into consideration.
- i) The module has some printed circuit boards (PCBs) on the back. Be sure to avoid them from any stress or pressure when handling or installing the module; otherwise some of electronic parts on the PCBs may be damaged.
- j) Observe all other precautionary requirements in handling components.
- k) When some pressure is added onto the module from rear side constantly, it causes display non-uniformity issue, functional defect, etc. So, please avoid such design.
- l) When giving a touch to the panel while turning on the power supply, it may cause degradation. In that case, once turn off the power supply, and turn on again after several seconds, and then degradation is disappeared a few seconds after turning on again.
- 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.

## 11. Shipping condition 2 3

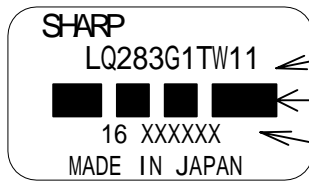
- a) Maximum number of carton over which can be stacked: maximum 2 cartons
- b) Maximum quantity in a carton : 2 set
- c) Carton size : 840(W)×399(H)×802(D)(mm)
- d) Gross weight for 1 set : maximum 43kg

Packing drawing is shown in Fig. 3.



13 . Others

1) Lot No. and indication Label:

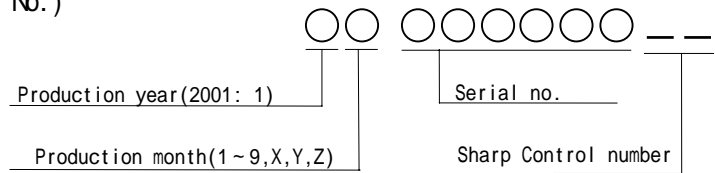


Model No.

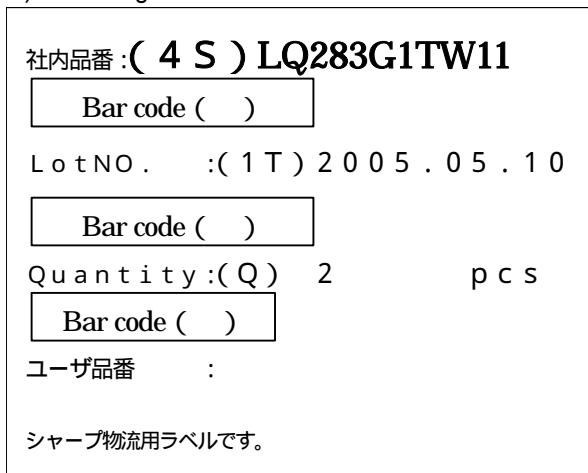
Bar Code( Lot No.)

Lot No.

【How to express Lot No.】



2) Packing Label

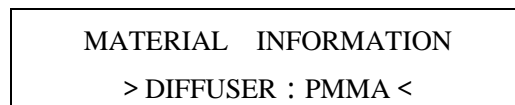


Model No. (LQ283G1TW11)

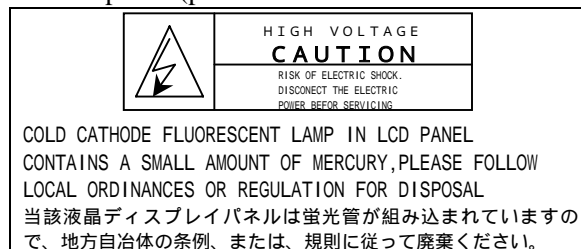
Lot No. (Date)

Quantity

- 3) 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.
- 4) Disassembling the module can cause permanent damage and should be strictly avoided.
- 5) Please be careful since image retention may occur when a fixed pattern is displayed for a long time.
- 6) The chemical compound which causes the destruction of ozone layer is not being used.
- 7) Warning of mercury and material information of LPG(Light Pipe Guide) are labeled on the back of the module.



- 8) Cold cathode fluorescent lamp in LCD PANEL contains a small amount of mercury, Please follow local ordinances or regulations for disposal. (put on the back of the module. Size: 63 × 25.5mm )



- 9) When any question or issue occurs, it shall be solved by mutual discussion.

## Carton storage condition

Temperature : 0 to 40

Humidity : 95%RH or less

Reference condition : 20 to 35 , 85%RH or less (summer)

: 5 to 15 , 85%RH or less (winter)

• the total storage time (40 ,95%RH) : 240H or less

Sunlight : Be sure to store in unpacked condition or at dark room to avoid direct sunlight.

Atmosphere: : Never leave in a corrosive atmosphere and/or an area that volatile liquids are generated.

## Cautions as to condensation:

- Do not put the carton directly on the floor. Be sure to keep on pallet or stand.

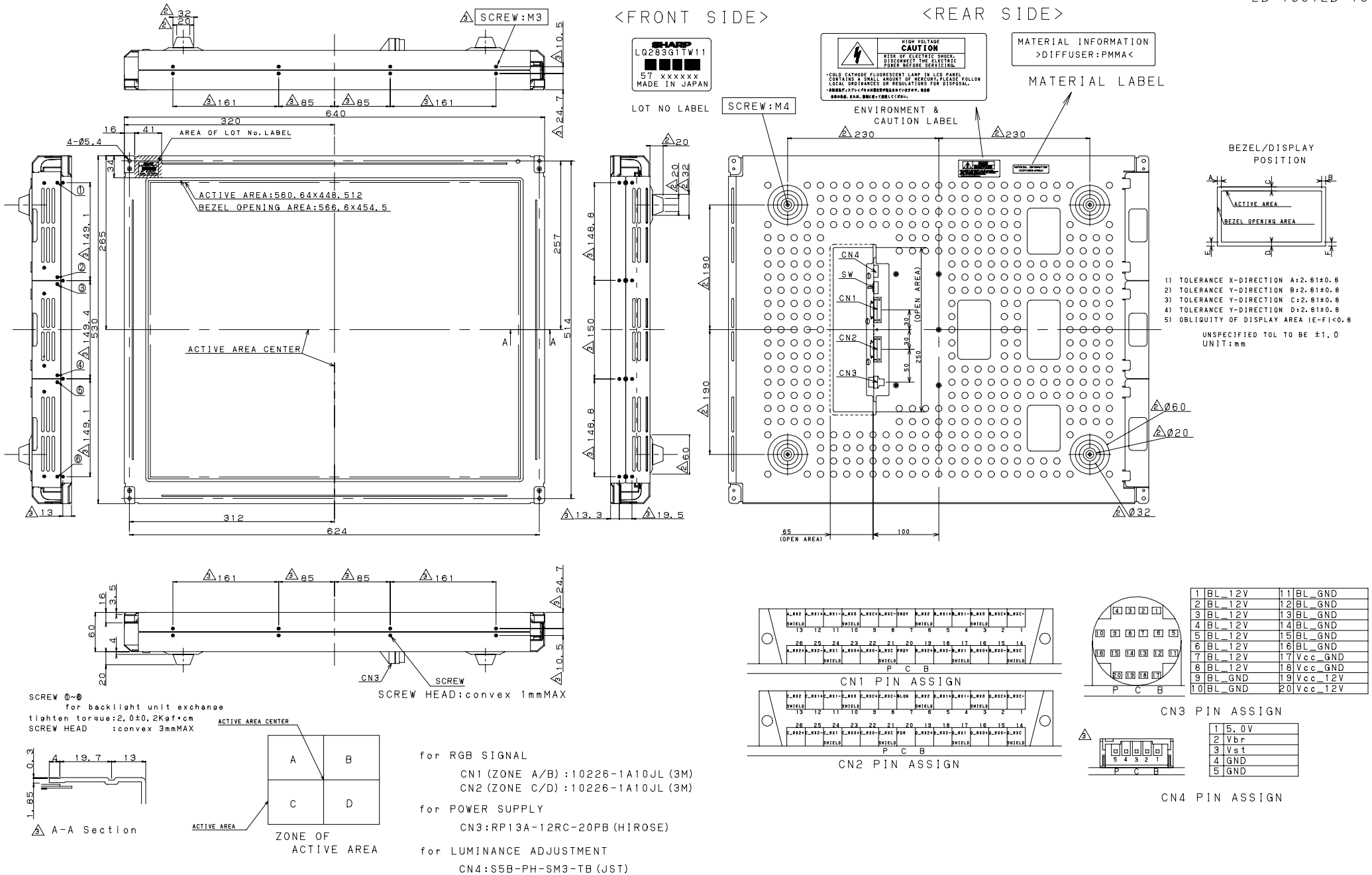
Also, to keep the ventilation of the bottom of pallet/stand well, be sure to place in the same direction properly.

-Be sure to keep away from the wall of warehouse.

- Please take care of ventilation in warehouse by using ventilation system.

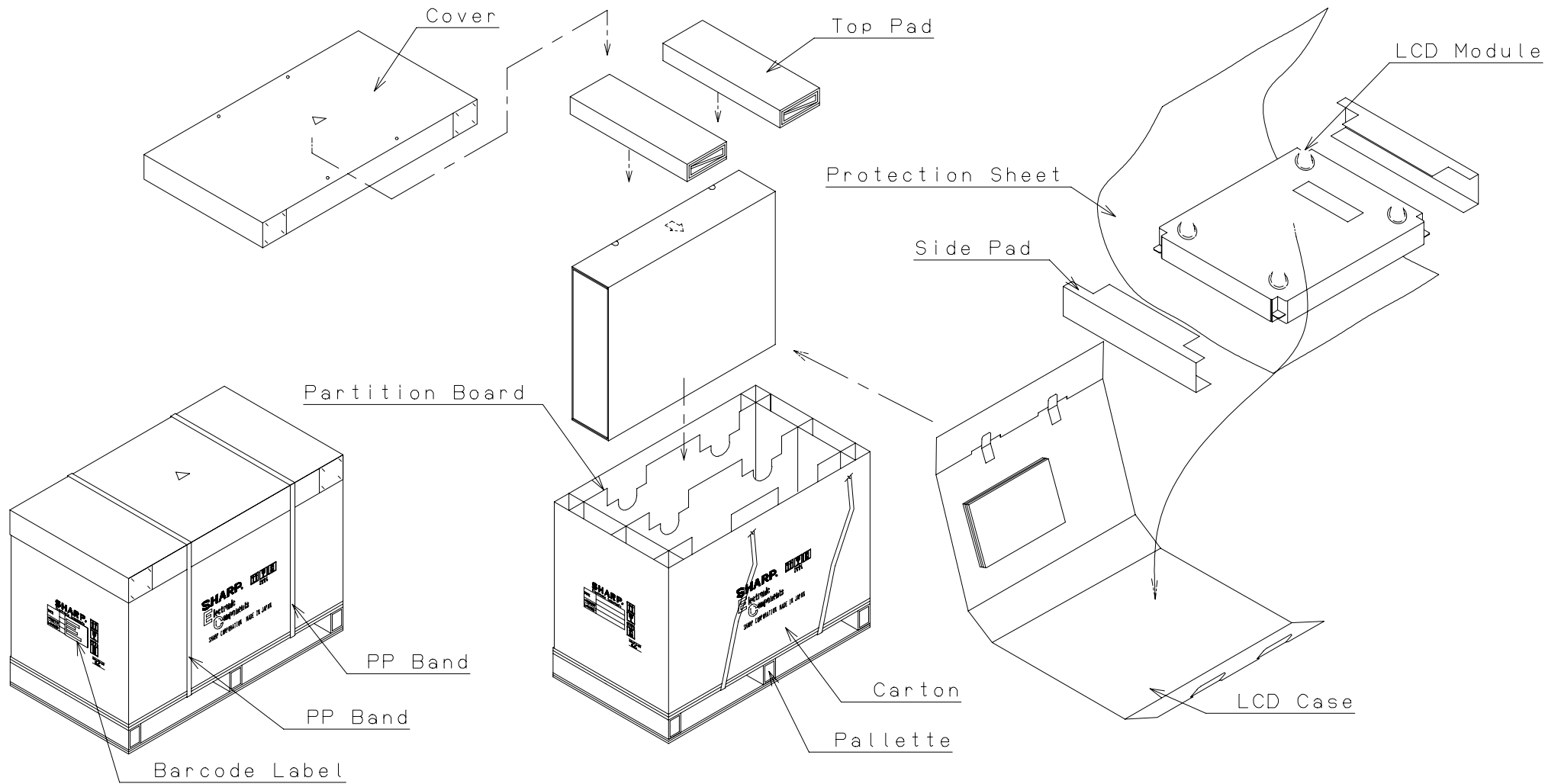
- Control the ambient temperature to avoid sudden temperature change.

Storage period : 1 year, in the above conditions.



▲3 2005. 07. 01  
▲2 2001. 09. 20  
2001. 06. 25

Fig1. LQ283G1TW11 MODULE OUTLINE



▲3 Fig. 3 Packing form

## **SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.**

Suggested applications (if any) are for standard use; See Important Restrictions for limitations on special applications. See Limited Warranty for SHARP's product warranty. The Limited Warranty is in lieu, and exclusive of, all other warranties, express or implied. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR USE AND FITNESS FOR A PARTICULAR PURPOSE, ARE SPECIFICALLY EXCLUDED. In no event will SHARP be liable, or in any way responsible, for any incidental or consequential economic or property damage.

---

# **SHARP**<sup>®</sup>

### **NORTH AMERICA**

---

SHARP Microelectronics of the Americas  
5700 NW Pacific Rim Blvd.  
Camas, WA 98607, U.S.A.  
Phone: (1) 360-834-2500  
Fax: (1) 360-834-8903  
Fast Info: (1) 800-833-9437  
www.sharpsma.com

### **EUROPE**

---

SHARP Microelectronics Europe  
Division of Sharp Electronics (Europe) GmbH  
Sonninstrasse 3  
20097 Hamburg, Germany  
Phone: (49) 40-2376-2286  
Fax: (49) 40-2376-2232  
www.sharpsme.com

### **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

### **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

### **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

### **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

### **HONG KONG**

---

SHARP-ROXY (Hong Kong) Ltd.  
3rd Business Division,  
17/F, Admiralty Centre, Tower 1  
18 Harcourt Road, Hong Kong  
Phone: (852) 28229311  
Fax: (852) 28660779  
www.sharp.com.hk

#### **Shenzhen Representative Office:**

Room 13B1, Tower C,  
Electronics Science & Technology Building  
Shen Nan Zhong Road  
Shenzhen, P.R. China  
Phone: (86) 755-3273731  
Fax: (86) 755-3273735