SHARP

LQ283G1TW11

TFT-LCD Module

Spec. Issue Date: July 1, 2005

No: LD-13612D

DEVICE SPECIFICATION FOR

TFT-LCD Module

MODEL No.

LQ283G1TW11

☐ CUSTOMER'S APPROVAL

DATE

BY

PRESENTED

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RECORDS OF REVISION

LQ283G1TW11

SPEC No.	DATE	REVISED No.	PAGE	SUMMARY	NOTE
LD-13612	June.25.2001	-	-	-	1st Issue
LD-13612A	July.27.2001	1	5	Correction : CN3 Mating connecter	
				Modification :　Notes3　An outline figure	
			11	Addition : 7. DE (TH,TV) maximum value	
			14	Correction :　Notes5　measurement point	
LD-13612C	Sep.20.2001	2	2	Addition : Mass value	
			3,4	Correction : CN1 CN2 Pin assign	
			9	Addition : 6-1 Consumption value	
				6-2 Consumption value	
				6-3 Adjusted voltage	
			13	Change : 9. Contrast ratio 350　　　400	
				Addition : 9.Luminance of white　Min. value	
			14	Addition :　Note4　Adjustment circuit	
			15	Addition : Gross weight for 1 set	
			19	Change :　Fig.1 Projection form	
LD-13612D	May.11.2005	3	1	Delete:　　Deletion of usage	
			11	Addition:　Vertical period Min. 60Hz	
			15	Change:　　11. Shipping condition	
			19	Addition:　Detailed CN4 drawing.	
				Detailed front bezel drawing.	
			20	Change:　　Packing form	

1. Application   3

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

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	2
Surface treatment	Anti-glare and hard-coating 2H		

*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	Ararm output of backlight lamp	Note
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 connecter 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)

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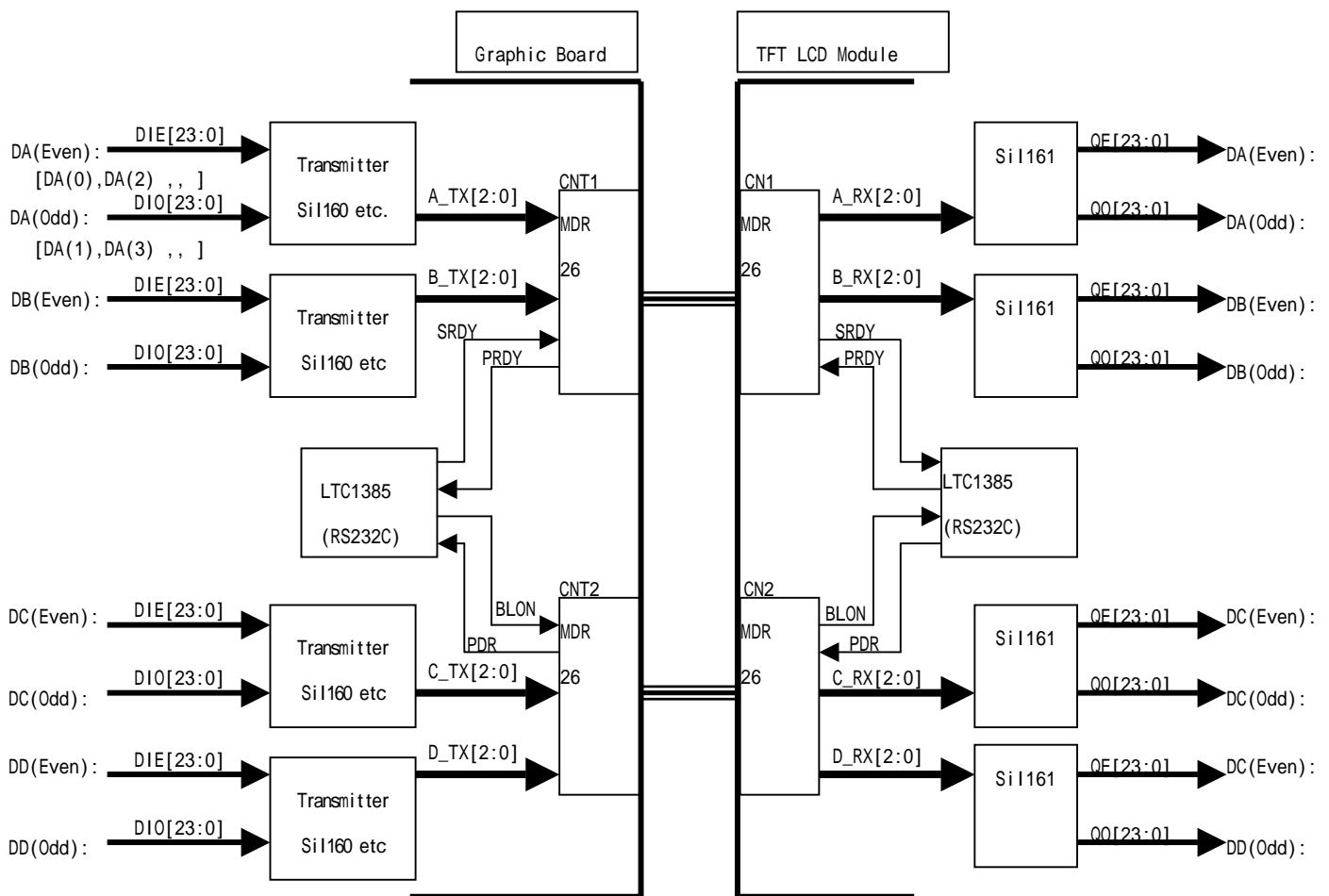
The table below shows the pin allocation of the pixel data and Panel Link.

| 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

Horizontal (default) position (PDR = L)

DA(0,0)	DA(1,0)	DA(2,0)

DB(0,0)	DB(1,0)

```
          0           1279  1280        2559
      0 ┌─┬─┬─┬───────┬─┬─┬──────────────┐
        │                                │
            A                  B
   1023 ┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄→ DB(1279,1023)
   1024
            C                  D
   2047 └────────────────────────────────┘ → DD(1279,1023)
```

DC(0,0)	DC(1,0)

DA(1279,1023)	DB(0,1023)	DB(1,1023)
DC(1279,0)	DD(0,0)	DD(1,0)
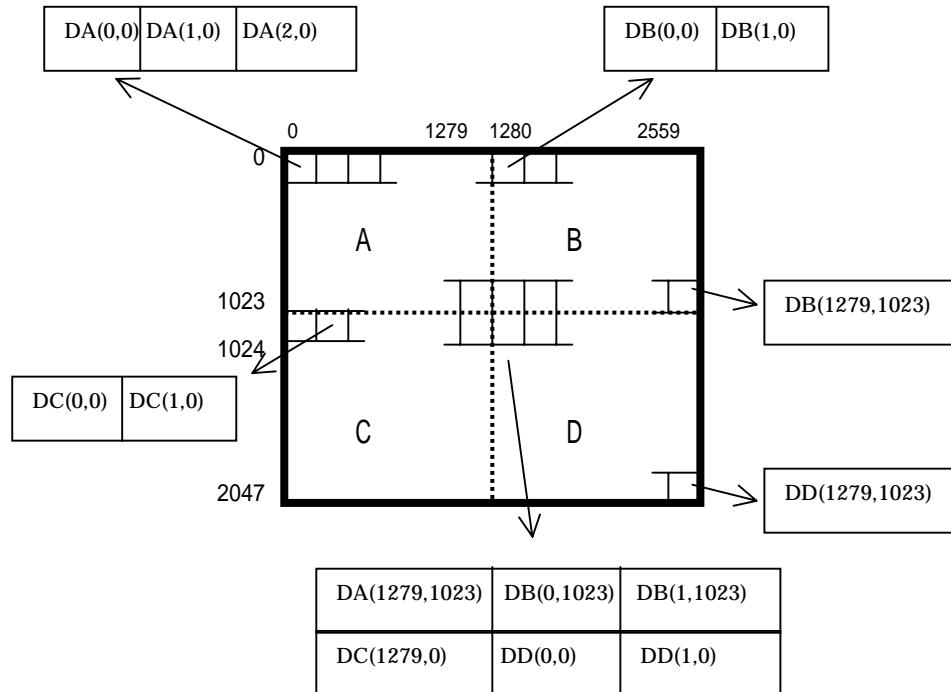
Turn to vertical position (PDR = H)

```
              1024            0
        ┌──────────┬─┬───────┬─┐  0
        │                      │
   DC(0,0)        C           A
   DC(1,0)
        ┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄┄  1280
   DD(0,0)        D           B
   DD(1,0)
        └──────────┴───────────┘
```

DC(0,0)
DC(1,0)

DA(0,0)
DA(1,0)

DD(0,0)
DD(1,0)

DB(0,0)
DB(1,0)
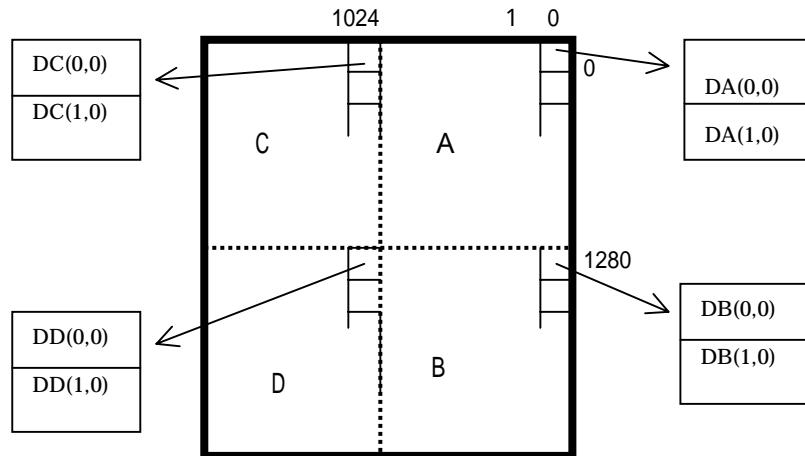
PDR switch is located near close to CN in the backside of TFT module, as shown "SW" in Fig.1.   It is normally set at "L" side.

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		

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	2
Allowable input ripple voltage		V_{RF}	-	-	100	$mV_{P.P}$		
Differential input voltage		V_{ID}	75	-	1000	mV		
Input leak current		I_O	-10		10	μA		

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		2
Allowable input ripple voltage		V_{RF}	-	-	100	$mV_{P.P}$		

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_I	50000	-	-	hour	Note4
Alarm output	High voltage	VstH	IstH=20μA	4.9	Vout		V	Unusual
			IstH=2.6mA	4.6	4.8	Vout	V	
	Low voltage	VstL	IstL= 20μA		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 60ms

　　0 t2 10ms

　　0 t3 1s

　　t4 100ms
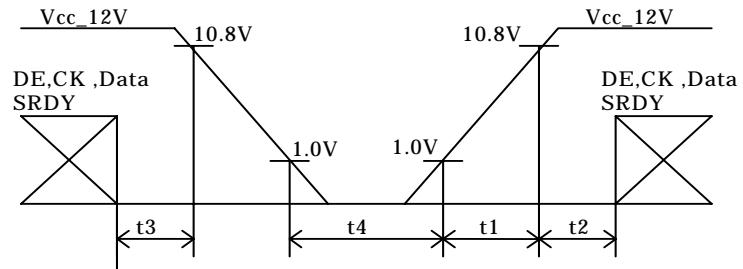
2) Voltage sag

Vcc(Vcc_12V,B/L_12V):
　Vmin =11.4V　　Vth =9.6V
　. Vth　　Vcc　　Vmin
　td　20ms
　. Vcc　　Vth
　　Refer to *1
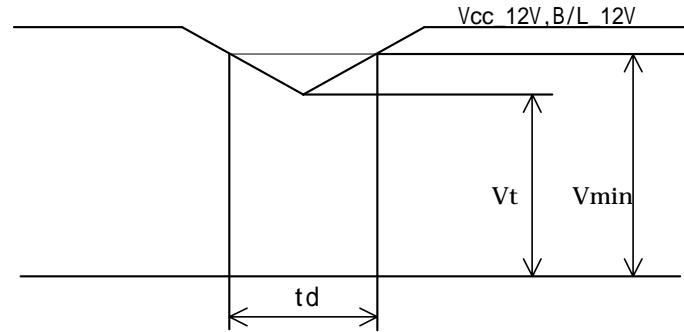
*1　When Vcc(Vcc_12V,B/L_12V) goes down to Vth level and below, the module stops operating. Please follow the sequence mentioned in 1) and turn on power supply again.

Note2　Measurement pattern of amperage

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.
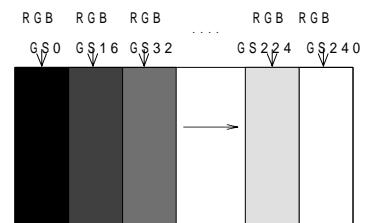
Note3　Relation between Adjusted voltage Vbr and Display brightness

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

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	Horizontal period	TH	700	704	928	Clock	
(Data enable			12.9	13.5	16.2	µs	
signal)	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.

D1: (R[7:0], G[7:0], B[7:0])

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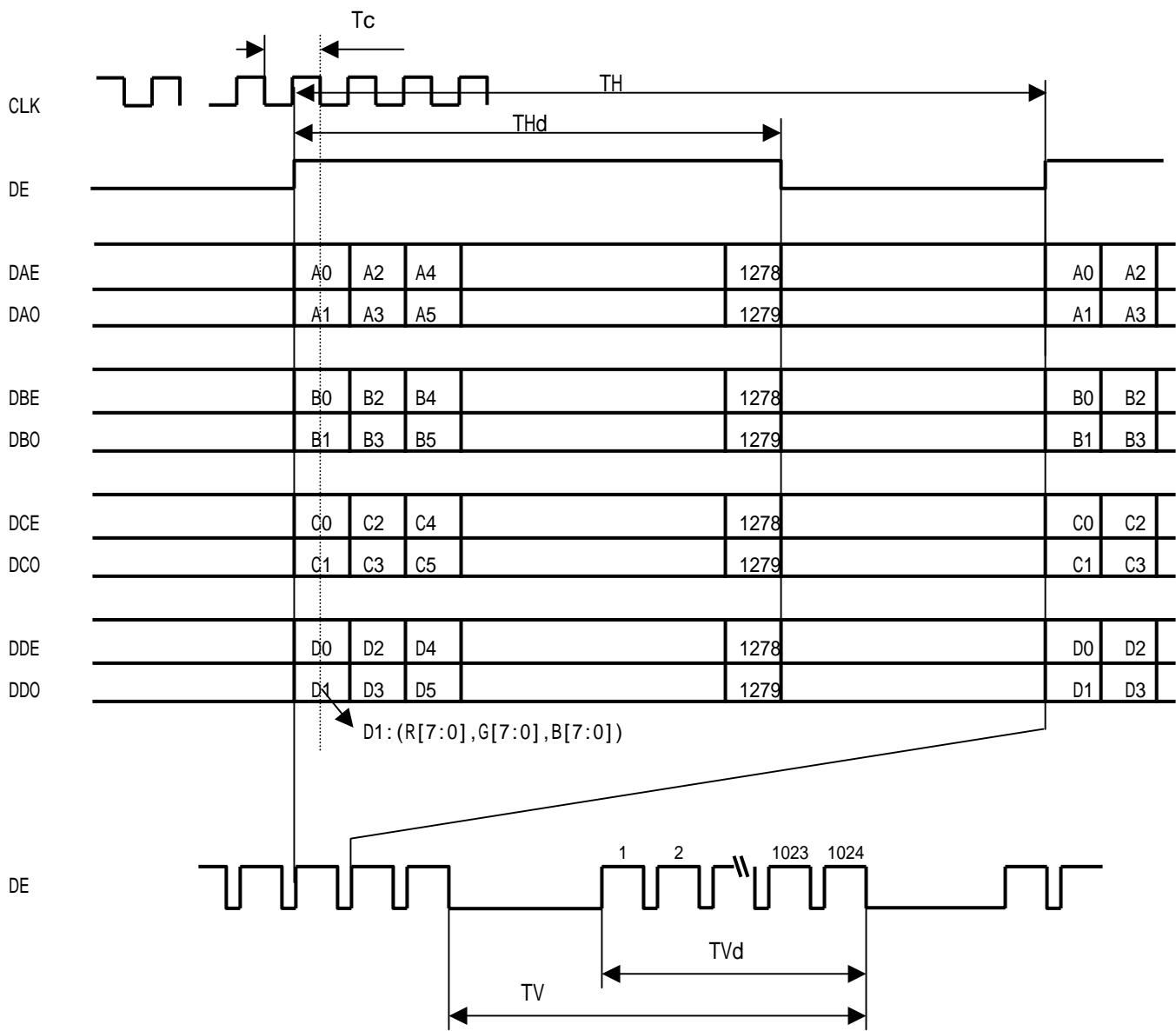
8. Input Signals, Basic Display Colors and Gray Scale of Each Color

Colors & Gray scale		Gray Scale	Data signal																								
			RA0	RA1	RA2	RA3	RA4	RA5	RA6	RA7	GA0	GA1	GA2	GA3	GA4	GA5	GA6	GA7	BA0	BA1	BA2	BA3	BA4	BA5	BA6	BA7
			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			= °		400			Note 2,4	2
Response Time	Rise	r	= °		20			Note 3,4	
	Decay	d			5				
Chromaticity of White		Wx	= °	0.283	0.313	0.343		Note 4	
		Wy		0.299	0.329	0.359			
Chromaticity of Red		Rx	= °	0.577	0.607	0.637			
		Ry		0.309	0.339	0.369			
Chromaticity of Green		Gx	= °	0.257	0.287	0.317			
		Gy		0.567	0.597	0.627			
Chromaticity of Blue		Bx	= °	0.115	0.145	0.175			
		By		0.057	0.087	0.117			
Luminance of White			= ° (Max.)	180	225		cd/m²	Note 4	2
			= ° (Min.)		22.5				
White Uniformity			= °			1.25		Note 5	

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.
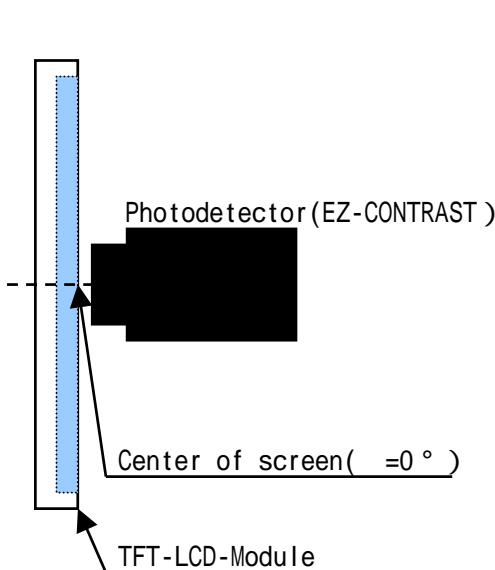
Fig2-1 Viewing angle measurement method
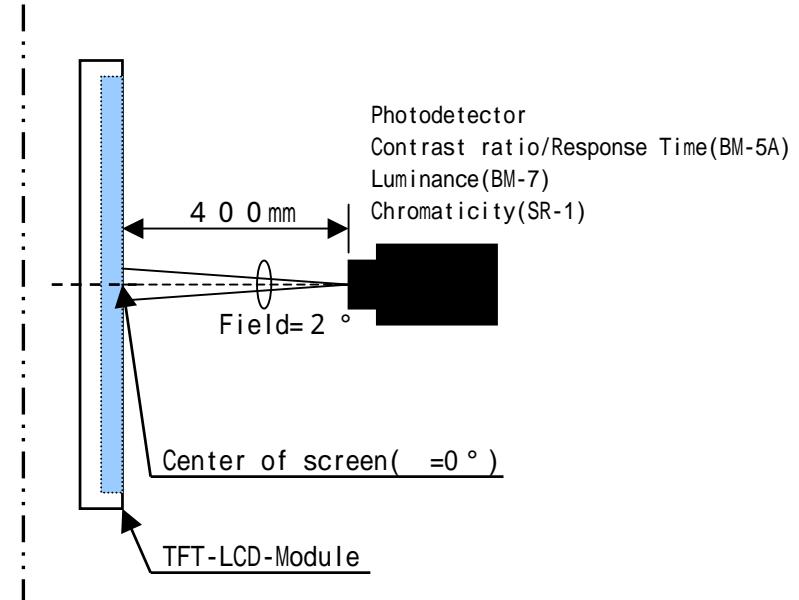
Fig2-2 Luminance/Contrast ratio/Response time/Chromaticity measurement method

Fig2 Optical characteristics measurement method

Note1　Definitions of viewing angle range:

Normal line

θ22　θ12　θ11　θ21

6 o'clock direction
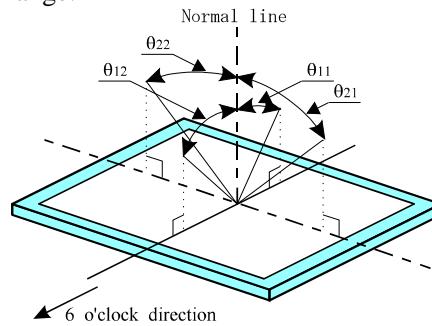
Note2　Definition of contrast ratio:

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".

white　　black　　white

Photodetector output (Relative Value)

100%
90%

10%
0%

τd　　τr

time
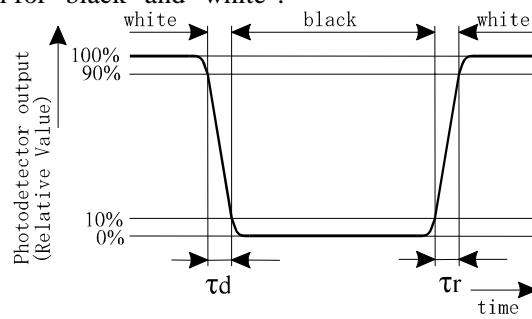
Note4　This shall be measured at center of the screen.

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

2

5.0V

System

br

Vbr(CN4 2pin)

LCD Module
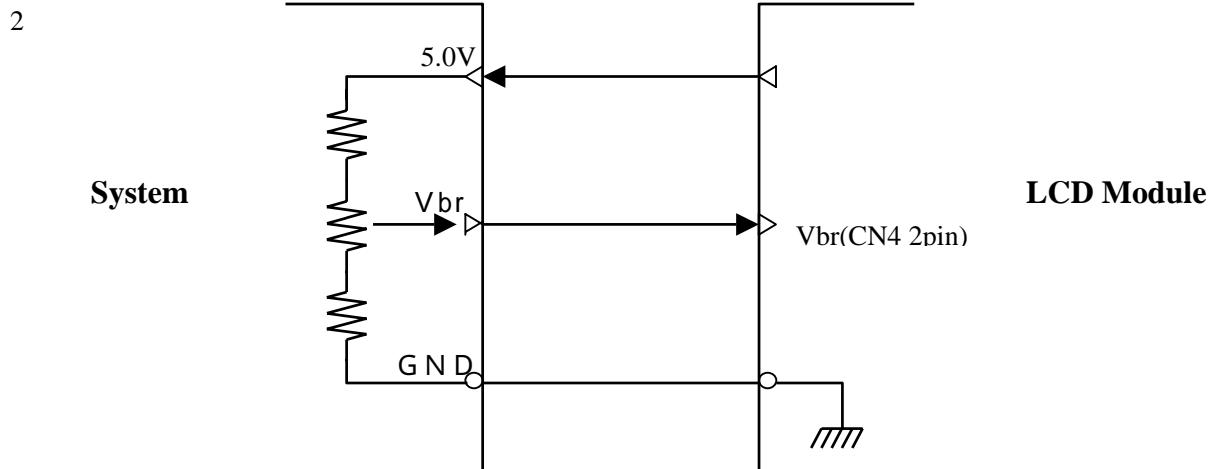
Note5　Definition of white uniformity:

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

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

640　1280　1920　pixel

A　D　512

C　1024

B　E　1536

pixel
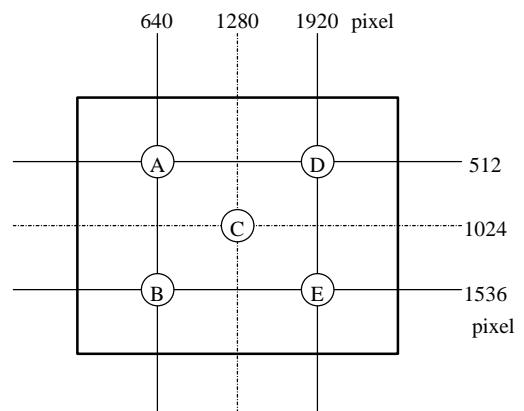
10. Handling Precautions

   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 fronts polarize 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 form 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   : $840(W) \times 399(H) \times 802(D)$ (mm)

   d)   Gross weight for 1 set   :   maximum 43kg


Packing drawing is shown in Fig. 3.

12 Reliability test items

No.	Test item	Conditions
1	High temperature storage test	Ta=60 240h
2	Low temperature storage test	Ta=-25 240h
3	High temperature & high humidity operation test	Ta=40 ; 95%RH 240h (No condensation)
4	High temperature operation test	Ta=40 240h (The panel temp. must be less than 60)
5	Low temperature operation test	Ta=0 240H
6	Vibration test (non- operating)	Frequency : 10 57Hz/Vibration width (one side) : 0.075mm : 58 500Hz/Gravity : 9.8m/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 : 196m/s^2 Pulse width : 11ms, sine wave Direction : $\pm$ X, $\pm$ Y, $\pm$ Z, once for each direction.

Result Evaluation Criteria

   Under the display quality test conditions with normal operation state, these shall be no change that may affect practical display function.

13   Others

1) Lot No. and indication Label:

SHARP
LQ283G1TW1 ————— Model No.

■ ■ ■ ■ ←————— Bar Code(Lot No.)

16 XXXXX ←————— Lot No.
MADE IN JAPAN
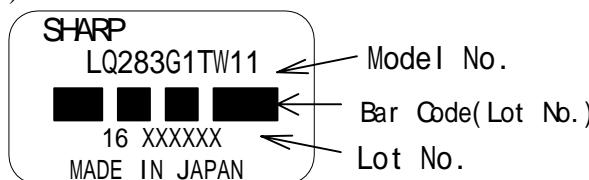
How to express Lot No.

○○ ○○○○○○ — —

Production year(2001: 1)

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

Serial no.

Sharp Control number

2) Packing Label

LQ283G1TW11

Bar code

Bar code

Bar code
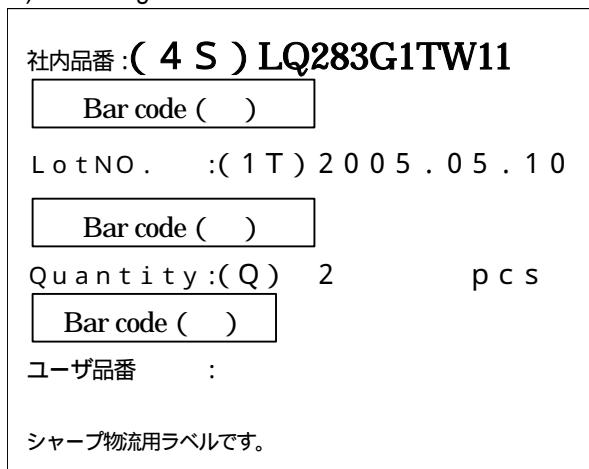
Model No. (LQ283G1TW1)

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.

MATERIAL   INFORMATION
DIFFUSER   PMMA

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)

⚠ RISK OF ELECTRIC SHOCK
DISCONECT THE ELECTRIC
POWER BEFOR SERVICING

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

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 palette 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.

SHARP

LD-13612D-19

<FRONT SIDE>

<REAR SIDE>
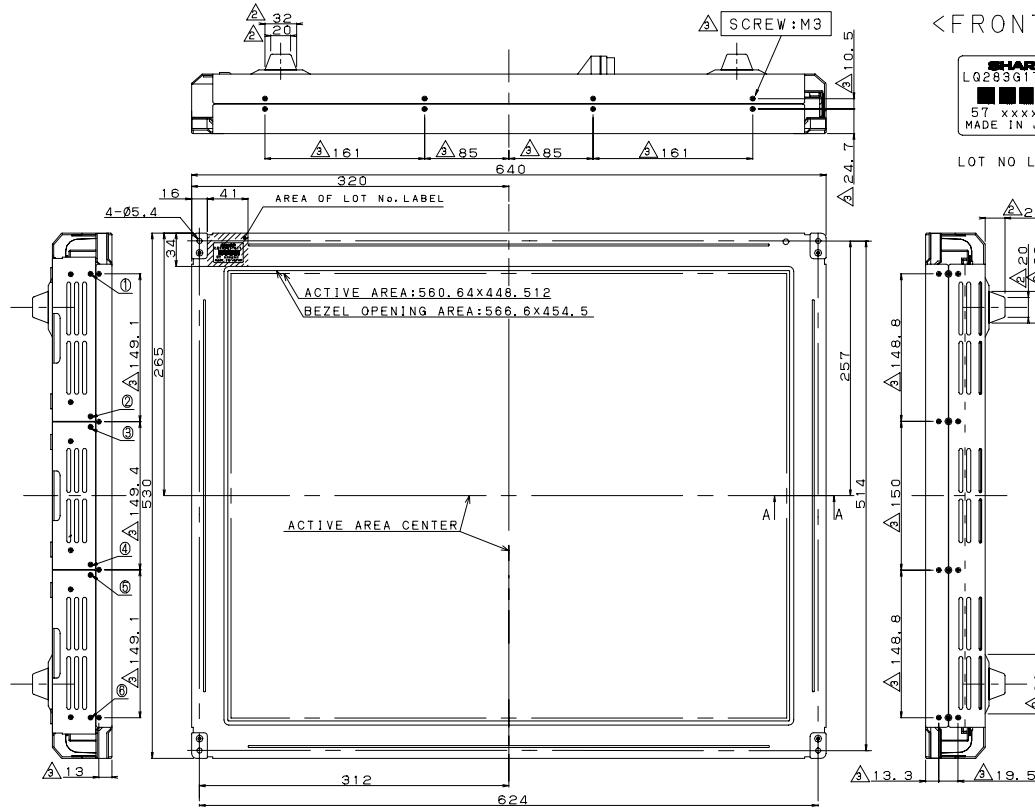
SHARP
LQ283G1TW11
57 xxxxxx
MADE IN JAPAN

LOT NO LABEL

SCREW:M4

SCREW:M3

HIGH VOLTAGE
CAUTION
RISK OF ELECTRIC SHOCK.
DISCONNECT THE ELECTRIC
POWER BEFORE SERVICING.

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

ENVIRONMENT &
CAUTION LABEL
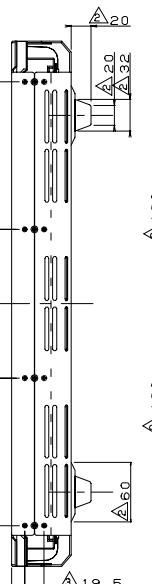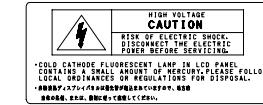
MATERIAL INFORMATION
>DIFFUSER:PMMA<

MATERIAL LABEL

BEZEL/DISPLAY
POSITION

ACTIVE AREA
BEZEL OPENING AREA
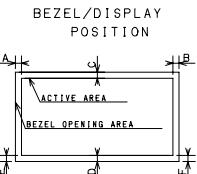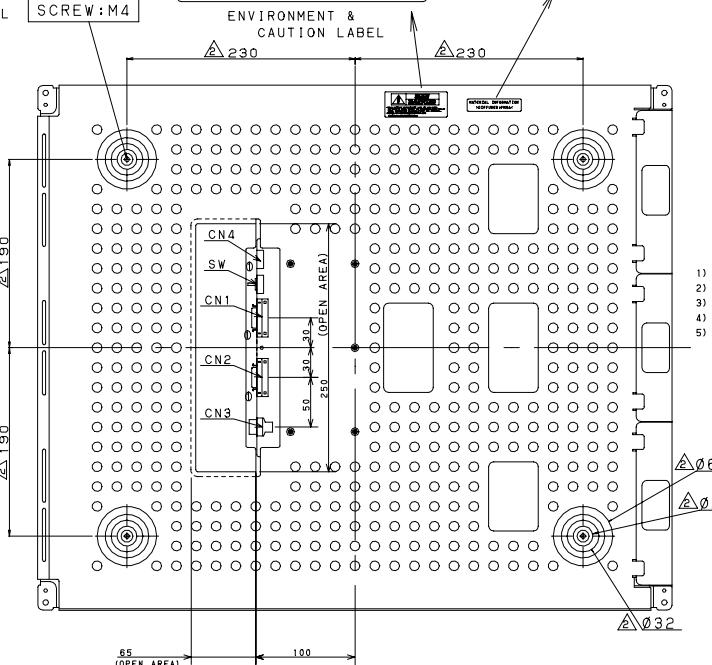
1) TOLERANCE X-DIRECTION A:2.81±0.8
2) TOLERANCE Y-DIRECTION B:2.81±0.8
3) TOLERANCE Y-DIRECTION C:2.81±0.8
4) TOLERANCE Y-DIRECTION D:2.81±0.8
5) OBLIQUITY OF DISPLAY AREA |E-F|<0.8

UNSPECIFIED TOL TO BE ±1.0
UNIT:mm

AREA OF LOT No.LABEL

ACTIVE AREA:560.64x448.512
BEZEL OPENING AREA:566.6x454.5

ACTIVE AREA CENTER

4-Ø5.4

CN4
SW
CN1
CN2
CN3

(OPEN AREA)

Ø60
Ø20
Ø32

65
(OPEN AREA)

100

A-A Section

SCREW ①~⑧
for backlight unit exchange
tighten torque:2.0±0.2Kgf·cm
SCREW HEAD   :convex 3mmMAX

SCREW HEAD:convex 1mmMAX

CN3

SCREW

ZONE OF
ACTIVE AREA

| A | B |
| C | D |

ACTIVE AREA CENTER
ACTIVE AREA

for RGB SIGNAL
    CN1(ZONE A/B):10226-1A10JL(3M)
    CN2(ZONE C/D):10226-1A10JL(3M)

for POWER SUPPLY
    CN3:RP13A-12RC-20PB(HIROSE)

for LUMINANCE ADJUSTMENT
    CN4:S5B-PH-SM3-TB(JST)

CN1 PIN ASSIGN

CN2 PIN ASSIGN

CN3 PIN ASSIGN
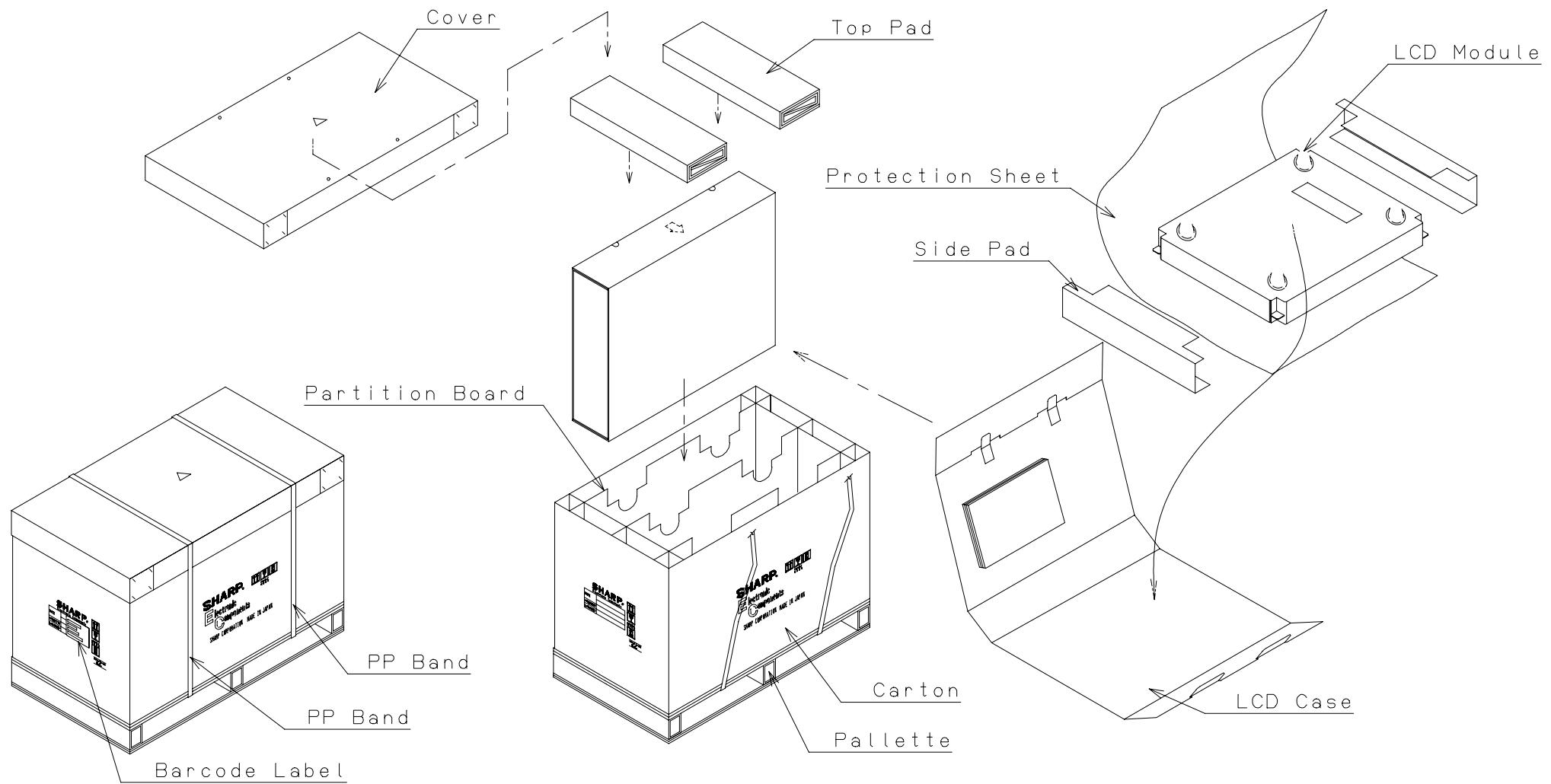
1	BL_12V	11	BL_GND
2	BL_12V	12	BL_GND
3	BL_12V	13	BL_GND
4	BL_12V	14	BL_GND
5	BL_12V	15	BL_GND
6	BL_12V	16	BL_GND
7	BL_12V	17	Vcc_GND
8	BL_12V	18	Vcc_GND
9	BL_GND	19	Vcc_12V
10	BL_GND	20	Vcc_12V

CN4 PIN ASSIGN

1	5.0V
2	Vbr
3	Vst
4	GND
5	GND

▲3 2005.07.01
▲2 2001.09.20
   2001.06.25

Fig1. LQ283G1TW11 MODULE OUTLINE

SHARP

Cover

Top Pad

LCD Module

Protection Sheet

Side Pad

Partition Board

PP Band

PP Band

Carton

Pallette

LCD Case

Barcode Label

▲3 Fig. 3 Packing form

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