CRYSTAL CLEAR TECHNOLOGY

Product Specification

T700T08X00

(REVISION4)

Crystal Clear Technology Sdn. Bhd.

1.0   Table of Contents

2.0   Records of Revision

Rev	Date	Item	Page	Comment	Originator	Checked By
1.0	16.03.16			Initial Release	Adam	Azhar
2.0	17.03.16			Revise Mechanical Specification	Azhar	Azhar
3.0	08.06.17			Add new version N00 and R00	Azhar	Azhar
4.0	17.01.18	3	3	Add Dots Size		
		11	22	Update Mechanical Specification	Azhar	Azhar

3.0   General Specification

    T700T08X00 is 7.0" color TFT-LCD (Thin Film Transistor Liquid Crystal Display) module composed of LCD panel, driver ICs control circuit, LED backlight and Touch Panel. This display area contains 800 x 480 pixels and can display up to 16M colors. This product compliant with RoHS environmental requirement.
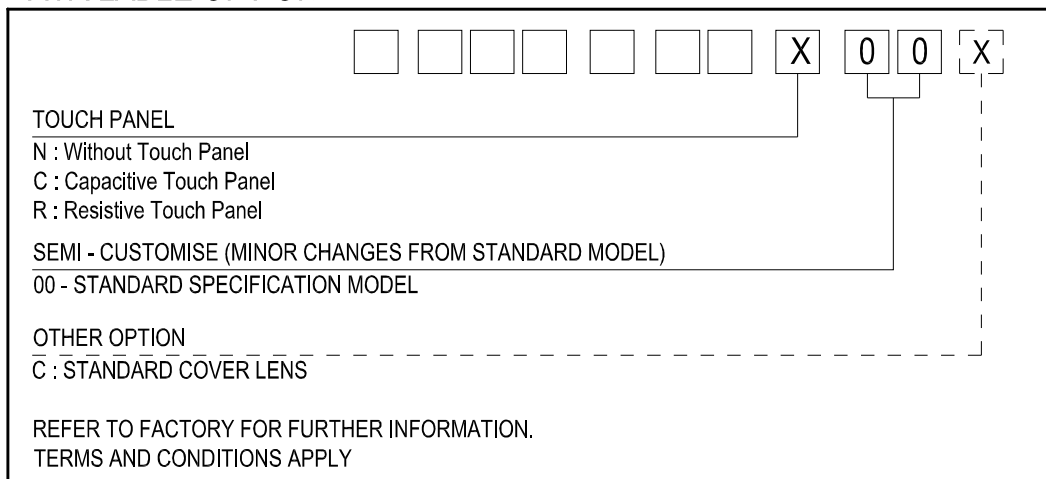
Item	Contents	Unit	Note
LCD Type	7.0" TFT	-	
Display color	16.2M		1
Viewing Direction (Optimum View)	12	O 'Clock	
Operating temperature	-20~+70	℃	
Storage temperature	-30~+80	℃	
Module size	164.9 (H) x 100 (V) x 5.6 (D)	mm	2
Active Area(W×H)	154.08 (H) x 85.92 (V)	mm	
Number of Dots	800(RGB) X 480	dots	
Dot Size	0.192 x 0.179	mm	
Controller	ILI6480 or equivalent	-	
Backlight	21-LEDs (white)	pcs	
Brightness	250	cd/m2	3
Interface Mode	TTL RGB	-	
Data Transfer	RGB	-	

Note 1: Color tone is slightly changed by temperature and driving voltage.
Note 2: FPC or wire are not included.
Note 3: Brightness measured on lcd surface, with additional Touch panel and Cover lens, brightness will reduce 20% (max).

AVAILABLE OPTION

TOUCH PANEL
N : Without Touch Panel
C : Capacitive Touch Panel
R : Resistive Touch Panel

SEMI - CUSTOMISE (MINOR CHANGES FROM STANDARD MODEL)
00 - STANDARD SPECIFICATION MODEL

OTHER OPTION
C : STANDARD COVER LENS

REFER TO FACTORY FOR FURTHER INFORMATION.
TERMS AND CONDITIONS APPLY

4.0   Absolute Maximum Ratings

   4.1   Electrical Absolute Maximum ratings (Vss = 0V, Ta = 25°C)

Item	Symbol	Min.	Max.	Unit	Note
Digital Supply Voltage	DVCC	-0.3	5.0	V	
Analogue Supply Voltage	AVCC	-0.5	13.5	V	
Gate on Voltage	VDDG	-0.3	+42	V	
Gate on Voltage	VEEG	-20	+0.3	V	
Gate on Gate Off Voltage	VDDG-VEEG	12	40	V	

Notes:

1. If the module is above these absolute maximum ratings. It may become permanently damaged.
2. V_{CC} >V_{SS} must be maintained.
3. Please be sure users are grounded when handing LCD Module.

   4.2   Environmental Absolute Maximum Ratings

Item	Storage		Operating		Note
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature	-30℃	80℃	-20℃	70℃	1,2
Humidity	-	-	-	-	3

1. The response time will become lower when operated at low temperature.
2. Background color changes slightly depending on ambient temperature. The phenomenon is reversible.
3. Ta<=40°C and 85%RH MAX.
    (Ta>=40°C. Absolute humidity must be lower than the humidity of 85%RH at 40°C)

5.0   Electrical Characteristics and Instruction Code

5.1   Electrical Characteristics (Vss = 0V, Ta = 25°C)

Parameter		Symbol	Min	Typ	Max	Unit	Note
Digital Supply Voltage		DVDD	3.0	3.3	3.6	V	
Analogue Supply Voltage		AVDD	9.4	9.6	9.8	V	
Gate On Voltage		VDDG	17	18	19	V	
Gate Off Voltage		VEEG	-6.6	-6	-5.4	V	
Common Voltage		VCOM	3.8	4	4.2	V	Note1
Input voltage	'H'	VIH	$0.7V_{CC}$	-	DVDD	V	
	'L'	VIL	GND	-	0.3DVDD	V	

Note:
1: Please adjust VCOM to make the flicker level to be minimum.

5.2   Current Consumption

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Gate on Current	IVDDG	VDDG=18V	-	0.5	1	mA	
Gate Off Current	IVEEG	VEEG=-6V	-	0.5	1	mA	
Digital Current	IDVDD	DVDD=3.3V	-	8	15	mA	Note1
Analogue Current	IAVDD	AVDD=9.6V	-	30	40	mA	
Total Power Consumption	PC		-	327	458	mW	

Max Specification: Black Test Pattern
Level Test Pattern: Grey

a. Grey-level pattern   b. Black Pattern

5.3 LED Backlight Specification (Vss = 0V, Ta = 25°C)

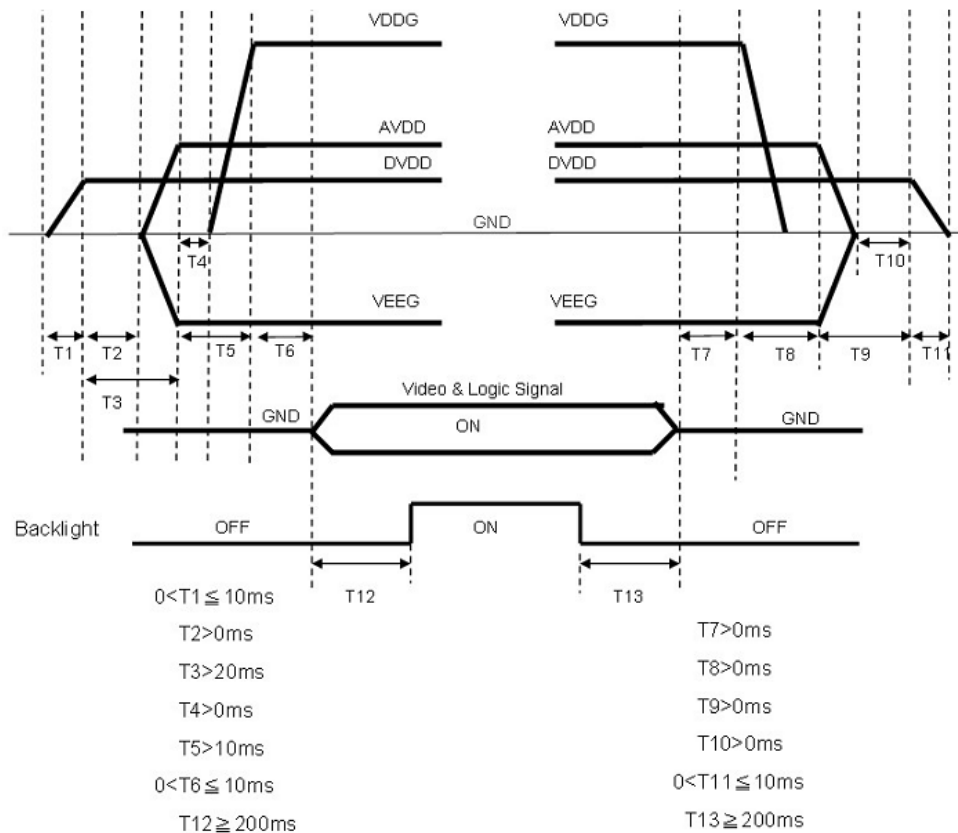| Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply Voltage	V_{LED}	-	8.7	9.9	11	V	1
Supply Current	If	-	-	140	-	mA	2
Led lifetime			20000				3

Note:
1. $V_{LED} = V_{LED} (+) - V_{LED} (-)$.
2. It is recommended that customer supply constant current to prolong the led lifetime and optimum led performance
3. Definition of Lifetime: Luminance < 50% of initial Luminance
    (Test condition: Ta = 25ºC, Constant current supply (typical Value))

5.4 Power Signal Sequence

Power On: DVDD → AVDD/VEEG → VDDG → Video &Logic Signal → Backlight
Power Off: Backlight→ Video &Logic Signal → VDDG → AVDD/VEEG → DVDD


```
0<T1≦10ms          T12              T13
T2>0ms                        T7>0ms
T3>20ms                       T8>0ms
T4>0ms                        T9>0ms
T5>10ms                       T10>0ms
0<T6≦10ms                     0<T11≦10ms
T12≧200ms                     T13≧200ms
```

Note: The product and specifications are subject to change without any notice. Please ask for latest Product Specification to guarantee the satisfaction of our product requirement.

5.5 Timing Characteristics of input signals

|	ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	Note
DCLK	Dot Clock	$1/t_{CLK}$	29	33	38	MHz	
	DCLK pulse duty	Tcwh	40	50	60	%	
DE	Setup Time	Tesu	8	-	-	ns	
	Hold time	Tehd	8	-	-	ns	
	Horizontal Period	t_H	1026	1056	1086	t_{CLK}	
	Horizontal Valid	t_{HA}		800		t_{CLK}	
	Horizontal Blank	t_{HB}	226	256	286	t_{CLK}	
	Vertical Period	t_V	515	525	535	t_H	
	Vertical Valid	t_{VA}		480		t_H	
	Vertical Blank	t_{VB}	35	45	55	t_H	
SYNC	HSYNC Setup Time	Thst	8	-	-	ns	
	HSYNC Hold Time	Thhd	8	-	-	ns	
	VSYNC Setup Time	Tvst	8	-	-	ns	
	VSYNC Hold Time	Tvhd	8	-	-	ns	
	Horizontal Period	th	1026	1056	1086	t_{CLK}	
	Horizontal Pulse Width	thpw	-	30	-	t_{CLK}	thb + thpw=46DCLK is fixed
	Horizontal Back Porch	thb	-	16	-	t_{CLK}	
	Horizontal Front Porch	thfp	180	210	240	t_{CLK}	
	Horizontal Valid	thd		800		t_{CLK}	
	Vertical Period	tv	515	525	535	th	
	Vertical Pulse Width	tvpw	-	13	-	th	tvpw + tvb = 23th is fixed
	Vertical Back Porch	tvb	-	10	-	th	
	Vertical Front Porch	tvfp	12	22	32	th	
	Vertical Valid	tvd		480		th	
DATA	Setup Time	Tdsu	8	-	-	ns	
	Hold Time	Tdhd	8	-	-	ns	
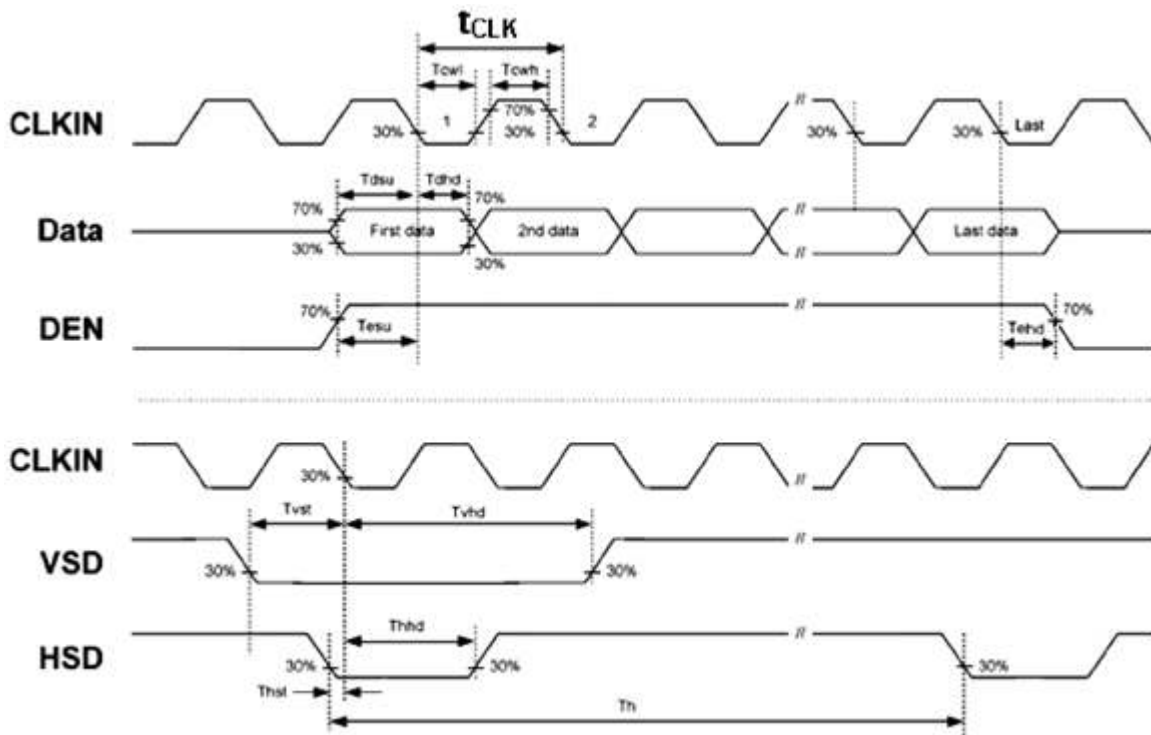
DE Mode

Horizontal Timing
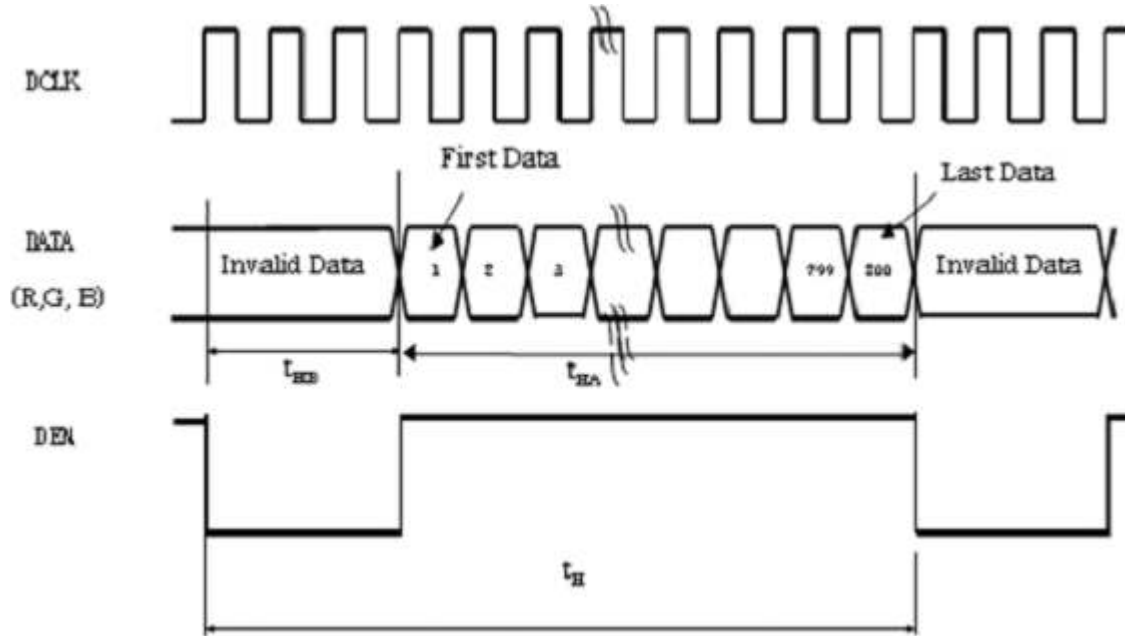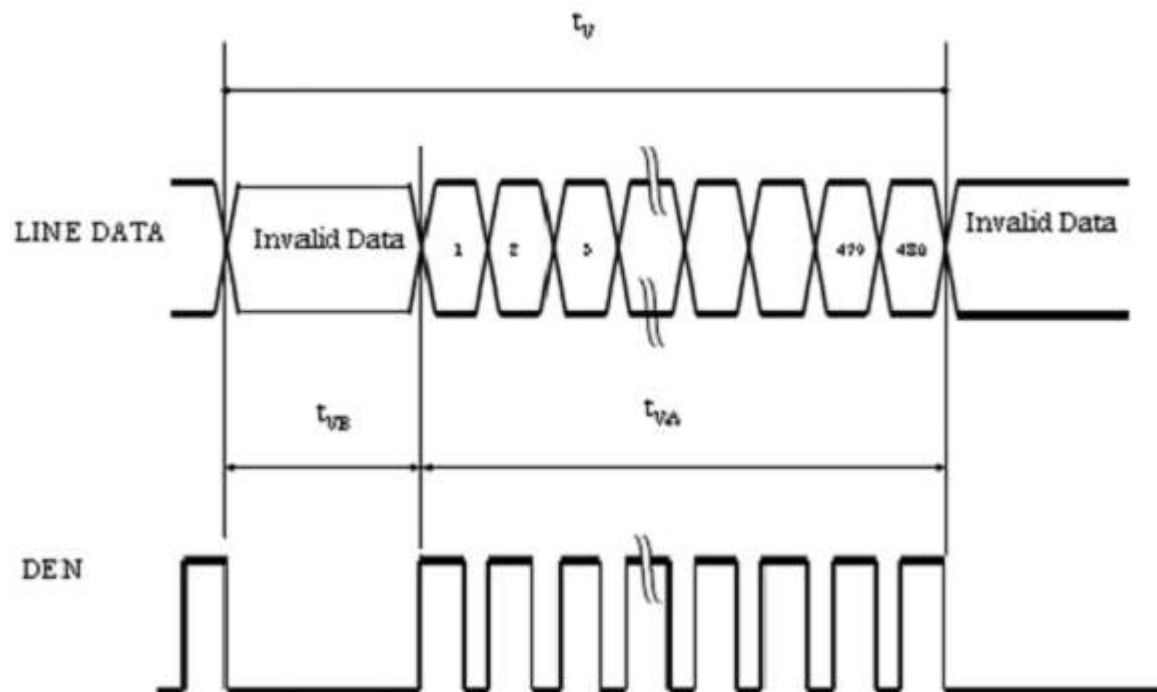
Vertical Timing

SYNC Mode

Horizontal Timing
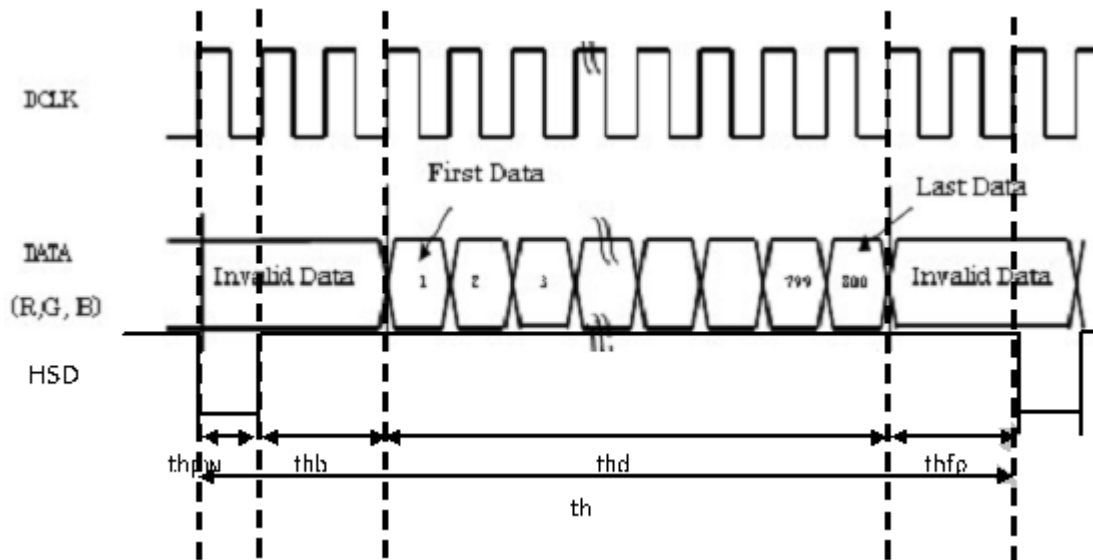
Vertical Timing
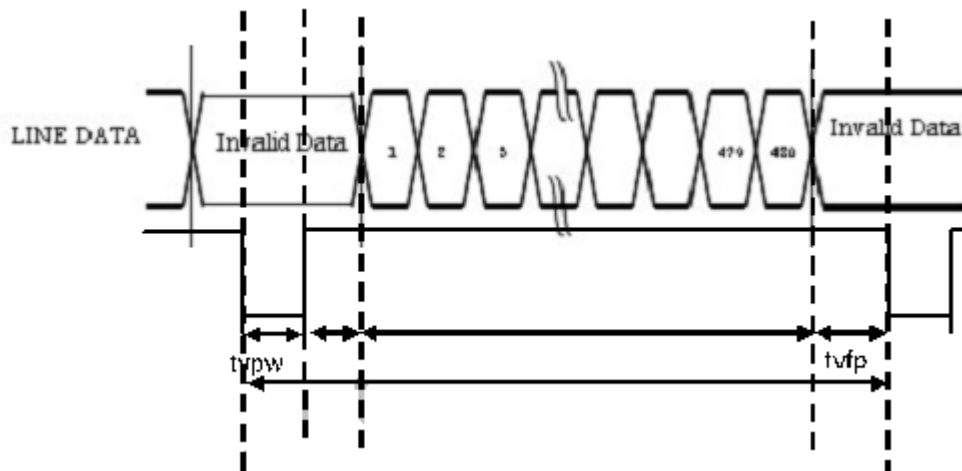
5.6 Interface Signal

Pin No.	Symbol	Function
1	VLED+	LED back light(Anode)
2	VLED+	LED back light(Anode)
3	VLED-	LED back light(Cathode)
4	VLED-	LED back light(Cathode)
5	GND	Ground
6	VCOM	Common Voltage
7	DVDD	Digital Power
8	MODE	DE/SYNC mode select, Normally pull high. H: DE mode, L: HSD/VSD mode
9	DE	Data Enable Signal
10	VSD	Vertica sync input. Negative polarity
11	HSD	Horizontal sync input. Negative polarity
12 ~ 19	B7 ~ B0	Blue data bus
20 ~ 27	G7 ~ G0	Green data bus
28 ~ 35	R7 ~ R0	Red data bus
36	GND	Ground
37	DCLK	Clock Input
38	GND	Ground
39	SHLR	Left or Right Display Control
40	UPDN	Up/Down Display Control
41	VDDG	Positive Power for TFT
42	VEEG	Negative Power for TFT
43	AVDD	Analogue Power
44	RSTB	Global Reset pin. Active low to enter state. Suggest to connecting with an RC reset circuit for stability. Normally pull high. (R=10Kohm, C=1uF)
45	NC	No Connection
46	VCOM	Common Voltage
47	DITH	Dithering Setting DITH = H – 6 bit resolution (last 2 bit of input data truncated) DITH = L – 8bit resolution (default setting)
48	GND	Ground
49	NC	No Connection
50	NC	No Connection

【Note1】SHLR：left or right setting
UPDN：up or down setting

SHLR	UPDN	Data shifting
DVDD	GND	Left→Right, Up→Down(default)
GND	GND	Right→Left, Up→Down
DVDD	DVDD	Left→Right, Down→Up
GND	DVDD	Right→Left, Down→Up

Definition of scanning direction
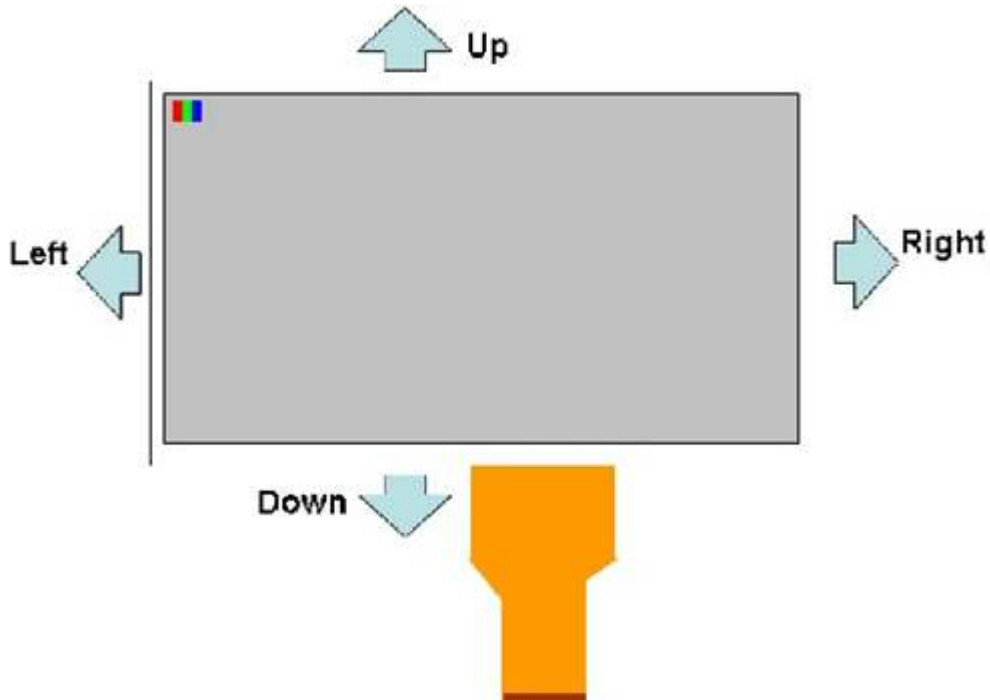
6.0   Optical Characteristics

6.1   Optical Characteristics

Backlight On	Item		Symbol	Condition	Specification			Unit
					Min.	Typ.	Max.	
	Contrast ratio		CR	θ= 0° Normal viewing angle	350	500	-	
	Luminance (I$_f$=20mA/LED, TFT panel surface)		L$_V$		180	250	-	cd/m^2
	Response time		T$_R$ +T$_F$		-	25	35	ms
	Color Chromaticity (Point#5)	Red	X$_R$		0.51	0.55	0.59	
			Y$_R$		0.35	0.39	0.43	
		Green	X$_G$		0.27	0.31	0.35	
			Y$_G$		0.57	0.61	0.65	
		Blue	X$_B$		0.11	0.15	0.19	
			Y$_B$		0.09	0.13	0.17	
		White	X$_W$		0.24	0.28	0.32	
			Y$_W$		0.32	0.36	0.40	
	Viewing Angle	Horizontal	θx+	CR≧10	60	70	-	
			θx-		60	70		
		Vertical	θy+		55	65		
			θy-		60	70	-	
	NTSC Ratio(Gamut)				45	50	-	%

Note: The parameter is slightly changed by temperature, driving voltage and materiel

Note 1: The data are measured after LEDs are turned on for 5 minutes. LCM displays full white. The brightness is the average value of 9 measured spots. Measurement equipment PR-705 (Φ8mm)

Measuring condition:
- Measuring surroundings: Dark room.
- Measuring temperature: Ta=25℃.
- Adjust operating voltage to get optimum contrast at the centre of the display.

Measured value at the centre point of LCD panel after more than 5 minutes while backlight turning on.
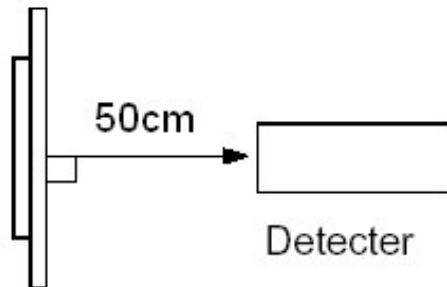
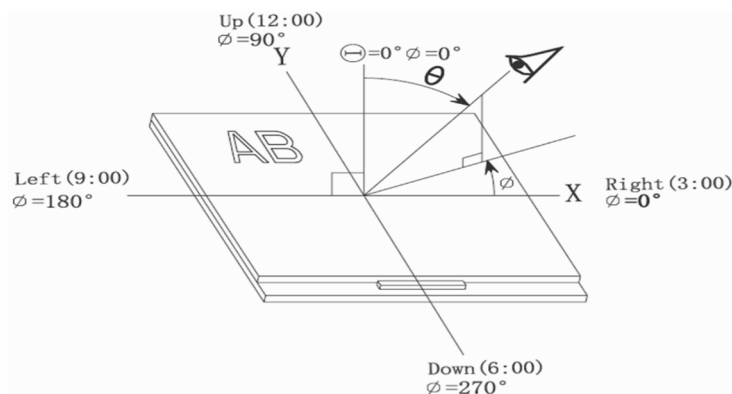Note 2: The luminance uniformity is calculated by using following formula.

$\triangle Bp = Bp \text{ (Min.)} / Bp \text{ (Max.)} \times 100 \text{ (%)}$

Bp (Max.) = Maximum brightness in 9 measured spots Bp (Min.) = Minimum brightness in 9 measured spots.
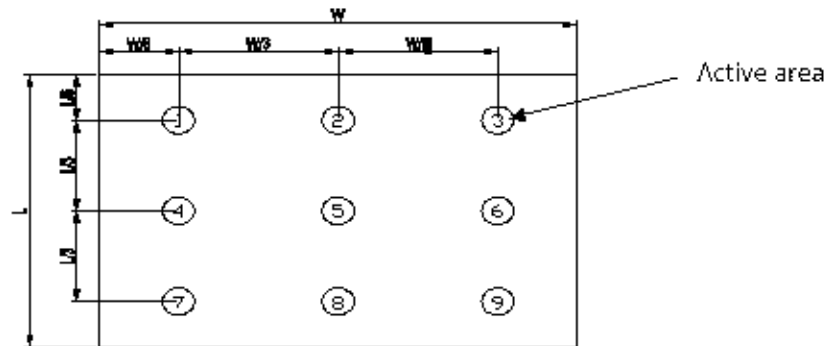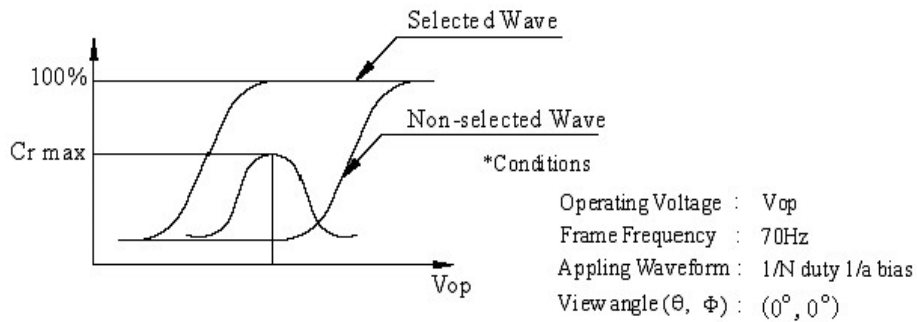

Note 3: The definition of viewing angle:
Refer to the graph below marked by *θ* and *Φ*

Note 4: Definition of contrast ratio. (Test LCD using DMS501)

Conditions

Operating Voltage	:	Vop
Frame Frequency	:	70Hz
Appling Waveform	:	1/N duty 1/a bias
View angle (Θ, Φ)	:	(0°, 0°)

$$\textit{Contrast ratio }(Cr) = \frac{\textit{Brightness of selected dots}}{\textit{Brightness of non−selected dots}}$$

Note 5: Definition of Response time. (Test LCD using DMS501):

The output signals of photo detector are measured when the input signals are changed from "black" to "white" (falling time) and from "white" to "black"(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figure as below.
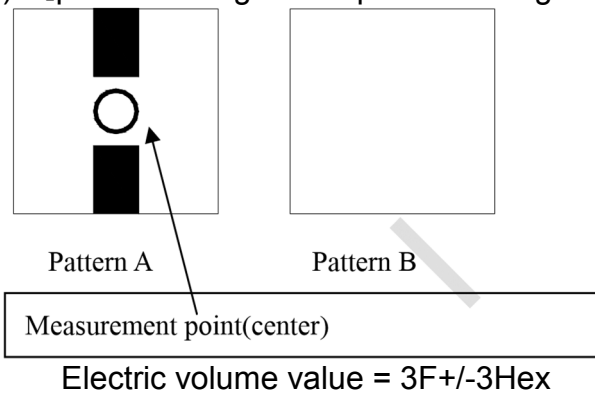

The Definition of response time
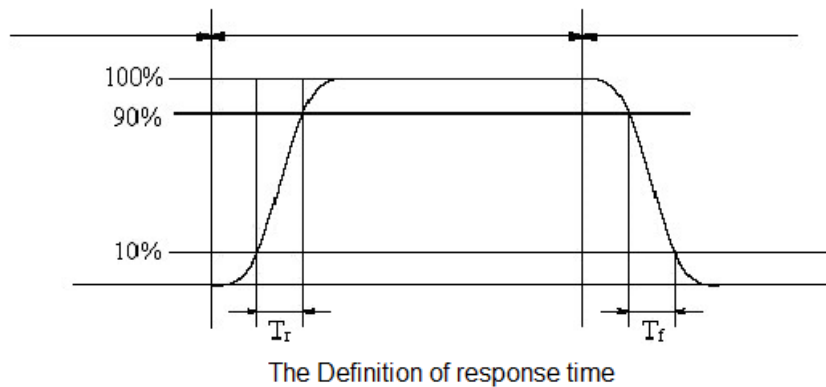
Note 6: Definition of Color of CIE Coordinate and NTSC Ratio.

1931 CIE Chromaticity Diagram

14
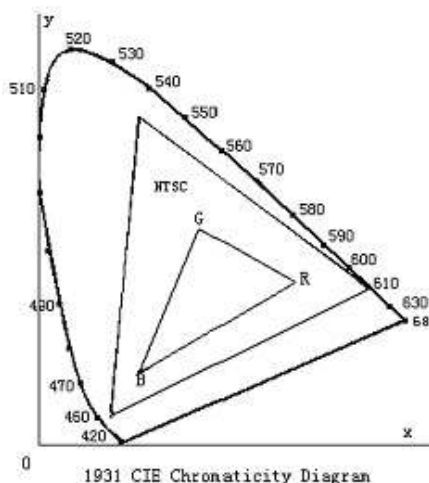
Note 7: Definition of cross talk.

Cross talk ratio (%) =〔pattern A Brightness-pattern B Brightness〕/pattern A

Pattern A   Pattern B

Measurement point(center)

Electric volume value = 3F+/-3Hex

7.0 Block Diagram
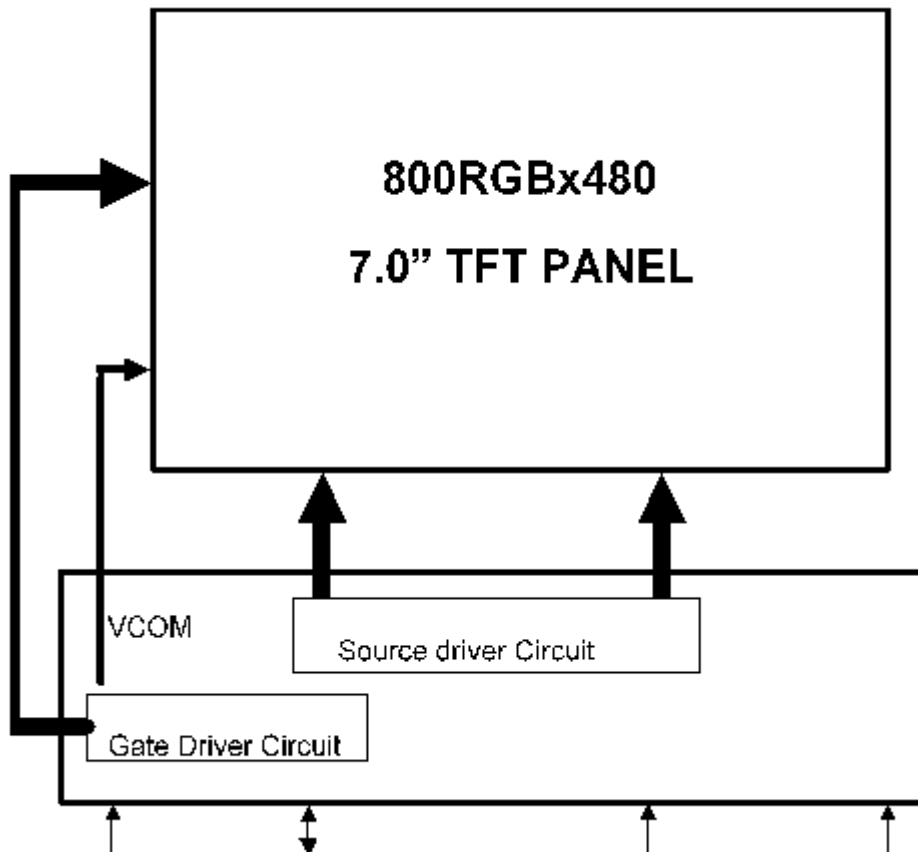
8.0   Reliability Test

Item		Test Condition
Operating	High Temperature	70degC, 96 hrs
	Low Temperature	-20degC,96 hrs
Storage	High Temperature	80degC, 240hrs and recovery for 2hrs
	Low Temperature	-30degC, 240hrs and recovery for 2hrs
	High Temperature and High Humidity	50degC, 90%RH, 240hrs and recovery for 2 hrs
Thermal	Cycle	Rt → 20degV → Rt → 70degC → RT 0min 30min 5min 30min 5min 50 cycles (Power off)
	Shock	Rt → 20degV → 70degC 0min 30min 30min 50 cycles (Power off)

Note: Rt means Room temperature

9.0   Inspection Criteria

No	Defect	Definition of defect	Inspection Criteria
1	a) Definition of dot	The size of defective dot over ½ of whole is regards as one defective dot. Smaller than ½ Larger than ½ R G B R G B 'No dot defect' '1 dot defect' (ignore) (counted)	A – Viewing area B – Viewing area C – Outside Viewing area
	b) Bright Dot	Dot appear bright and unchanged in size when LCD panel is displaying black pattern	
	c) Dark Dot	Dot appear dark and unchanged in size when LCD panel is displaying pure color (RED, GREEN or BLUE) pattern	

Defect	A	B	C
Bright Dot	1	1	
Dark Dot	2	2	NC
Total		4	

NC – Not Count

No	Defect	Definition of defect	Inspection Criteria
1	d) 2 dot adjacent	1 pair = 2 dots Type 1 Type 2 Type 3 or	

Defect	Acc. Count
2 Bright dot Adjacent	0
2 Dark dot Adjacent	1

No	Defect	Definition of defect	Inspection Criteria
2	Black spot White Spot Bright spot Pin Hole Foreign Particle	-Black/Dark/Bright Spot is points on display which appear dark/bright and usually result from contamination - These defect do not vary in size intensity (contrast) when contras is varied. D=(a+b)/2(mm)	

Defect Category	A	B
D ≤ 0.10	NC	
0.10 ≤ D ≤ 0.20	2	
0.20 ≤ D ≤ 0.30	1	NC
D ≥ 0.30	0	

No	Defect	Definition of defect	Inspection Criteria
3	Black Line White line Particle between POL and Glass Scratch on Glass	length width	

Defect Category	A	B
W ≤ 0.03	NC	
0.03 ≤ W ≤ 0.08, L ≤2.0	2	NC
W ≥ 0.08	0	

No	Defect	Definition of defect	Inspection Criteria
4	POL Bubble POL Dented		

Defect Category	A	B
D ≤ 0.20	NC	
0.20 ≤ D ≤ 0.30	3	
0.30 ≤ D ≤ 0.50	2	NC
D ≥ 0.5	0	

No	Defect	Definition of defect	Inspection Criteria
5	Mura (50% Grey)		Judged by Limit sample

10.0   Precaution and Limited Warranty

1.   Handing Precautions
   a.   The display panel is made of glass and polarizer. As glass is fragile. It tends to chip during handling especially on the edges. Please avoid dropping or jarring. Do not subject it to a mechanical shock of impact or by dropping it.
   b.   If the display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance is in contact with your skin or clothes, wash it off using soap and water.
   c.   Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands. This will stain the display area and degrade the insulation between terminals. Scratch and dents may occur on polarizer too.
   d.   The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully. Do not touch, push or rub the exposed polarizers with anything harder than a HB pencil lead (glass, tweezers, etc.). Do not put or attach anything on the display area to avoid leaving marks on it. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in a container before coming in to contact with room temperature air.
   e.   If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten cloth with one of the following solvents
         -   Isopropyl alcohol
         -   Ethyl alcohol
         -   Do not scrub hard to avoid damaging the display surface.
   f.   Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the following.
         -   Water
         -   Ketone
         -   Aromatic solvents
         -   Wipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading. Avoid contact with oil and fats.
   g.   Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.
   h.   Install the LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.
   i.   Do not attempt to disassemble or process the LCD module.
   j.   NC terminal should be open. Do not connect anything.
   k.   If the logic circuit power is off, do not apply the input signals.
   l.   Electro-Static Discharge Control. Since this module uses a CMOS LSI, the same careful attention should be paid to electrostatic discharge as for an ordinary CMOS IC. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
         -   Before removing LCM from its packing case or incorporating it into a set, be sure the module and your body have the same electric potential. Be sure to ground the body when handling the LCD modules.
         -   Tools required for assembly, such as soldering irons, must be properly grounded. Make certain the AC power source for the soldering iron does not leak. When using an electric screwdriver to attach LCM, the screw driver should be of ground potentiality to minimize as much as possible any

transmission of electromagnetic waves produced sparks coming from the commutator of the motor.

- To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions. To reduce the generation of static electricity be careful that the air in the work environment is not too dry. A relative humidity of 50%-60% is recommended. As far as possible make the electric potential of your work clothes and that of the work bench the ground potential.
- The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.

m. Since LCM has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it.
- Do not alter, modify or change the shape of the tab on the metal frame.
- Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
- Do not damage or modify the pattern writing on the printed circuit board.
- Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector.
- Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
- Do not drop, bend or twist the LCM.

2. Storage Precautions
   When storing the LCD modules, the following precaution are necessary.
   a. Store them in a sealed polyethylene bag. If properly sealed, there is no need for the desiccant.
   b. Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0□C and 35□C, and keep the relative humidity between 40%RH and 60%RH.
   c. The polarizer surface should not come in contact with any other objects.

3. Others
   a. Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.
   b. If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be regained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.
   c. To minimize the performance degradation of the LCD modules resulting from destruction caused by static electricity etc. Exercise care to avoid holding the following sections when handling the modules.
      Exposed area of the printed circuit board.
      Terminal electrode sections.

4. Using LCD Modules
   a. Installing LCD Modules
      The hole in the printed circuit board is used to fix LCM as shown in the picture below.
      Attend to the following items when installing the LCM.

b. Cover the surface with a transparent protective plate to protect the polarizer and LC cell.
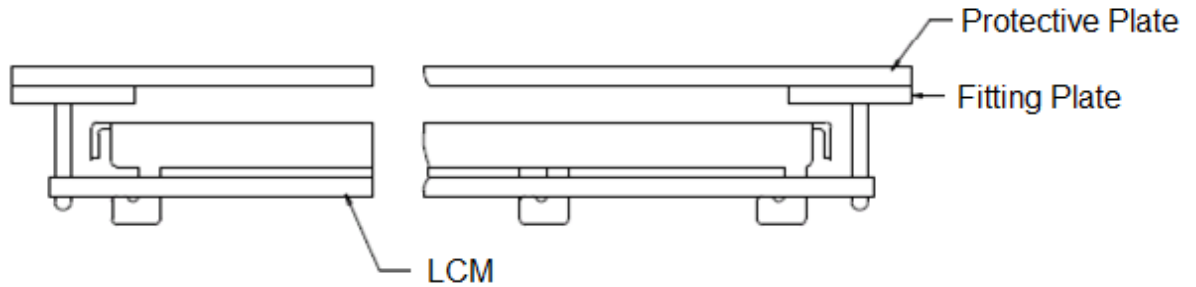
c. When assembling the LCM into other equipment, the spacer to the bit between the LCM and the fitting plate should have enough height to avoid causing stress to the module surface, refer to the individual specifications for measurements. The measurement tolerance should be 0.1mm.

d. Precaution for assemble the module with BTB connector:
   Please note the position of the male and female connector position, don't assemble or assemble like the method which the following picture shows

5. Precaution for soldering the LCM

	Manual soldering	Machine drag soldering	Machine press soldering
No RoHS Product	290°C ~350°C. Time: 3-5S.	330°C ~350°C. Speed: 4-8 mm/s.	300°C ~330°C. Time: 3-6S. Press: 0.8~1.2Mpa
RoHS Product	340°C ~370°C. Time: 3-5S.	350°C ~370°C. Time: 4-8 mm/s.	330°C ~360°C. Time: 3-6S. Press: 0.8~1.2Mpa

a. If soldering flux is used, be sure to remove any remaining flux after finishing the soldering operation (This does not apply in the case of a non-halogen type of flux). It is recommended that you protect the LCD surface with a cover during soldering to prevent any damage due to flux spatters.

b. When soldering the electroluminescent panel and PC board, the panel and board should not be detached more than three times. This maximum number is determined by the temperature and time conditions mentioned above, though there may be some variance depending on the temperature of the soldering iron.

c. When removing the electroluminescent panel from the PC board, be sure the solder has completely melted, the soldered pad on the PC board could be damaged.

6. Precautions for Operation
   a. Viewing angle varies with the change of liquid crystal driving voltage (VLCD). Adjust VLCD to show the best contrast.
   b. It is recommended to drive LCD's within the specified voltage limit since over limit will cause shorter LCD life. An electrochemical reaction due to direct current causes LCD deterioration. Avoid the use of direct current drive.
   c. Response time will be extremely delayed at lower temperature compared to room operating temperature range and on the other hand, at higher temperature LCD shows dark colour in them. However those phenomena do not mean malfunction. The LCD will return to normal performance when ambient temperature revert to room condition.
   d. If the display area is pushed hard during operation, the display will become abnormal. However, it will return to normal if it is turned off and on.
   e. A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.
   f. Input logic voltage before apply analogue high voltage such as LCD driving voltage when power on. Remove analogue high voltage before logic voltage when power off the module. Input each signal after the positive/negative voltage becomes stable.
   g. Please keep the temperature within the specified range for use and storage. Polarization degradation, bubble generation or polarizer peel-off may occur with high temperature and high humidity.

7. Safety
   a. It is recommended to crush damaged or unnecessary LCDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned.
   b. If any liquid leaks out of a damaged glass cell and comes in contact with the hands, wash off thoroughly with soap and water.

8. Limited Warranty

   Unless otherwise agreed between Crystal Clear Technology and customer, Crystal Clear Technology will replace or repair any of its LCD and LCM which is found to be defective electrically and visually when inspected in accordance with Crystal Clear Technology acceptance standards, for a period of one year from date of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of Crystal Clear Technology is limited to repair and/or replacement on the terms set forth above. Crystal Clear Technology will not responsible for any subsequent or consequential events.

9. Return LCM under Warranty

   No warranty can be granted if the precautions stated above have been disregarded. The typical examples of violations are:
   - Broken LCD glass
   - PCB eyelet's damaged or modified
   - PCB conductors damaged
   - Circuit modified in any way, including addition of components.
   - PCB tampered with by grinding, engraving or painting varnish.
   - Soldering to, or modifying the bezel in any manner.

   Module repairs will be invoiced to customer upon mutual agreement. Modules must be returned with sufficient description of failure or defects. Any connectors or cable installed by customer must be removed completely without damaging the PCB eyelet's, conductors and terminals.

164.90

156.60 - V.A (BZ)

154.08 - A.A (LCD)

5.55

6.91

3.60

5.17

SEE DETAIL B

PICK UP TAPE

5.70

100.0

89.05 - V.A (BZ)

85.92 - A.A (LCD)

VIEWING DIRECTION

7.33

65.94

68.22

CONTACT SIDE

STIFFENER

0.30±0.05

LOT NO STICKER

0.192

0.064

0.179

| R | G | B | R | G | B |
| R | G | B | R | G | B |

DETAIL B
SCALE 100:1

A ○—————○ K

BACKLIGHT SCHEMATIC

CN 1 PIN TABLE

1	2	3	4	5	6	7	8	9	10
VLED+	VLED+	VLED-	VLED-	GND	VCOM	DVDD	MODE	DE	VSD
11	12	13	14	15	16	17	18	19	20
HSD	B7	B6	B5	B4	B3	B2	B1	B0	G7
21	22	23	24	25	26	27	28	29	30
G6	G5	G4	G3	G2	G1	G0	R7	R6	R5
31	32	33	34	35	36	37	38	39	40
R3	R3	R2	R1	R0	GND	DCLK	GND	SHLR	UPDN
41	42	43	44	45	46	47	48	49	50
VDDG	VEEG	AVDD	RSTB	NC	VCOM	DITH	GND	NC	NC

NOTES:
1.DISPLAY MODE: A_SI TFT/TRANSMISSIVE/NORMAL WHITE
2.VIEWING ANGLE: 6'CLOCK
3.OPERATING TEMP: -20°C~70°C
4.STORAGE TEMP: -30°C~80°C
5.IC: SOURCE:ILI6122 ,GATE:ILI5960
6.ALL THA RAW MATERIAL ARE ROHS COMPLICANT
7.GENERAL TOLERANCE TO BE ±0.3mm

5.0±0.5

4.0±0.3

1

50

0.35

0.50

0.5±0.1

P0.5X(50-1)=24.5±0.1

25.5±0.1

DETAIL A
SCALE 4:1

Crystal Clear Technology

CRYSTAL CLEAR TECHNOLOGY SDN BHD

16, JLN TP5, TMN PERINDUSTRIAN SIME UEP,
47600 SUBANG JAYA, SELANGOR DARUL EHSAN.

PART NAME

MECHANICAL SPECIFICATION

APPROVED	CHECKED	DRAWN		DRAWING NUMBER	SHEET	REV.
		AZHAR	UNIT : MM	T700T08N00	1/1	2
		17-01-2018	NTS			

164.90

156.60 - V.A (BZ)

154.08 - A.A (LCD)

3.60
5.16

SEE DETAIL B

Y-

X+ X-

Y+

100.0
89.05 - V.A (BZ)
85.92 - A.A (LCD)

7.33

65.94

68.22

6.90

LOT NO STICKER

63.50±1.0

11.35

1 4

CONTACT SIDE STIFFENER
CONTACT SIDE STIFFENER

0.30±0.05
0.30±0.05

4 1

0.192
0.064
0.179

| R | G | B | R | G | B |
| R | G | B | R | G | B |

DETAIL B
SCALE 100:1

A○ ○K

BACKLIGHT SCEMATIC

Y-

X+ Y-

Y+

1 2 3 4

5.0±0.3

1 4

5.0
1.0
3.0±0.1 5.0±0.1 1.0±0.1

DETAIL B
SCALE 4:1

5.0±0.5
4.0±0.3

1 50

0.35
0.50

0.5±0.1

P0.5X(50-1)=24.5±0.1

25.5±0.1

DETAIL A
SCALE 4:1

CN 1 PIN TABLE

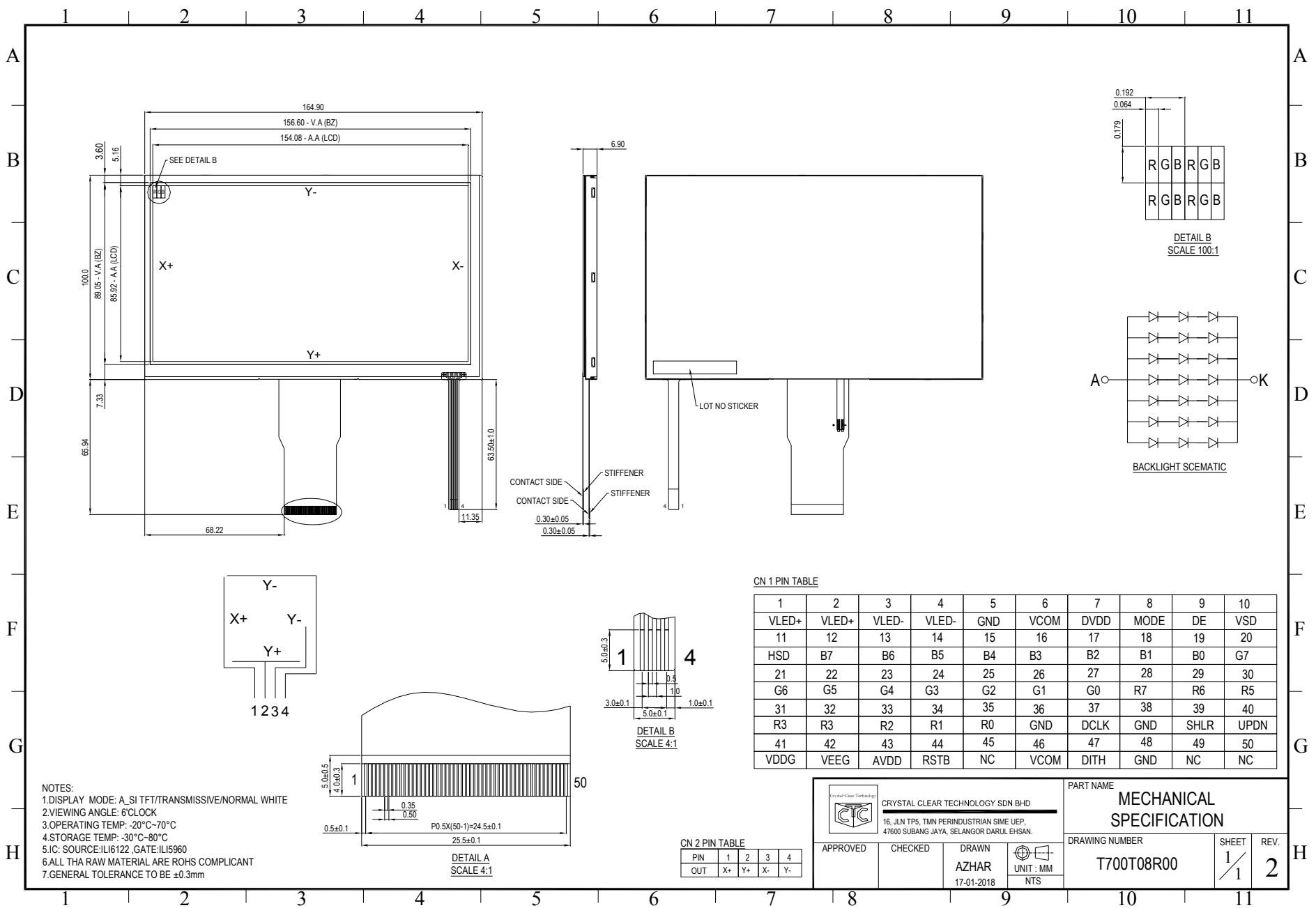| 1	2	3	4	5	6	7	8	9	10
VLED+	VLED+	VLED-	VLED-	GND	VCOM	DVDD	MODE	DE	VSD
11	12	13	14	15	16	17	18	19	20
HSD	B7	B6	B5	B4	B3	B2	B1	B0	G7
21	22	23	24	25	26	27	28	29	30
G6	G5	G4	G3	G2	G1	G0	R7	R6	R5
31	32	33	34	35	36	37	38	39	40
R3	R3	R2	R1	R0	GND	DCLK	GND	SHLR	UPDN
41	42	43	44	45	46	47	48	49	50
VDDG	VEEG	AVDD	RSTB	NC	VCOM	DITH	GND	NC	NC

NOTES:
1.DISPLAY MODE: A_SI TFT/TRANSMISSIVE/NORMAL WHITE
2.VIEWING ANGLE: 6'CLOCK
3.OPERATING TEMP: -20°C~70°C
4.STORAGE TEMP: -30°C~80°C
5.IC: SOURCE:ILI6122 ,GATE:ILI5960
6.ALL THA RAW MATERIAL ARE ROHS COMPLICANT
7.GENERAL TOLERANCE TO BE ±0.3mm

CN 2 PIN TABLE

PIN	1	2	3	4
OUT	X+	Y+	X-	Y-

Crystal Clear Technology
CTC

CRYSTAL CLEAR TECHNOLOGY SDN BHD

16, JLN TP5, TMN PERINDUSTRIAN SIME UEP,
47600 SUBANG JAYA, SELANGOR DARUL EHSAN.

PART NAME
MECHANICAL
SPECIFICATION

APPROVED	CHECKED	DRAWN		DRAWING NUMBER	SHEET	REV.
		AZHAR	UNIT : MM	T700T08R00	1/1	2
		17-01-2018	NTS			

26

183.19 - COVER LENS
155.08±0.1 - V.A
154.08 - A.A

15.14

117.20 - COVER LENS
86.92±0.1 - V.A
85.92 - A.A

59.22±0.5

78.72

1 50

(20.0)

(3.5)

45.87±0.5

IC

stiffener

(7.65)
7.65±0.3
0.7±0.1

0.30±0.05
0.30±0.05

(14.64)
(41.28)
82.38±1.0
41.1

1 2 6

7.60

164.9

10.5

100.0

stiffener

50 1

1

B

A○———————○K

BACKLIGHT SCHEMATIC

DETAIL B
SCALE 4:1

6
3.50
5.00
0.30
0.50
0.50
2.50
3.50

5.0±0.5 - stiffener
4.0±0.3 - contact side

1 50

0.35±0.05
0.50±0.05
0.50±0.1
P0.5X(50-1)=24.5±0.1
25.5±0.1

DETAIL A
SCALE 4:1

NOTE:
1. GENERAL TOLERANCE TO BE ±0.3MM
2. DISPLAY 16.7M COLORS (HI FRC)
3. OPERATING VOLTAGE: 3.7V (TYP)
4. OPERATING TEMPERATURE: -20°C ~ -65°C
5. STORAGE TEMPERATURE: -40°C ~ -85°C
6. RoSH COMPLIANCE

PIN OUT TABLE - CTP

PIN	SYMBOL
1	RESET
2	VCC
3	GND
4	INT
5	SDA
6	SCL

CN 1 PIN TABLE

1	2	3	4	5	6	7	8	9	10
VLED+	VLED+	VLED-	VLED-	GND	VCOM	DVDD	MODE	DE	VSD
11	12	13	14	15	16	17	18	19	20
HSD	B7	B6	B5	B4	B3	B2	B1	B0	G7
21	22	23	24	25	26	27	28	29	30
G6	G5	G4	G3	G2	G1	G0	R7	R6	R5
31	32	33	34	35	36	37	38	39	40
R3	R3	R2	R1	R0	GND	DCLK	GND	SHLR	UPDN
41	42	43	44	45	46	47	48	49	50
VDDG	VEEG	AVDD	RSTB	NC	VCOM	DITH	GND	NC	NC

	1	
MODEL NAME	NO	MATERIAL	REMARKS

Crystal-Clear Technology
CTC
CRYSTAL CLEAR TECHNOLOGY SDN BHD
16, JLN TP5, TMN PERINDUSTRIAN SIME UEP,
47500 SUBANG JAYA, SELANGOR DARUL EHSAN

PART NAME
MECHANICAL
SPECIFICATION

APPROVED	CHECKED	DRAWN		DRAWING NUMBER	SHEET	REV.
AZHAR	AZHAR	ADAM	UNIT : MM	T700T08C00C	1/1	3
		17-01-2018	NTS			

27

Crystal Clear Technology

Product Specification

TP0085-01

Crystal Clear Technology sdn. bhd.

16Jalan TP5—Taman Perindustrian Sime UEP
47600 Subang Jaya—Selangor DE
Malaysia. T: +603 80247099 F: +603 80247098

CRYSTAL CLEAR TECHNOLOGY SDN. BHD.

CONTENTS

1.0 Introduction

The purpose of this specification is defined the general provision and quality requirement apply to 7 inch Capacitive Touch module integrated by Crystal Clear Technology. This document, together with the module drawing, is the highest level specification for this product. When users touch module by finger, the module can send coordinates of point at the contact point to host. The finger position information is sent to host by I2C bus which is determined by host through IRQ line.

2.0 General Description

This document contains the Capacitive Touch module specification. The maximum rating, characteristics, hardware, and inspection of the module are described in the subsequent sections. In special, I2C protocol will be introduced in detail.

2.1 Touch sensor characteristics

- Technology: Use the character of capacitive among the touch electrodes on touch panel to identify the positions of touch signals
- Touch method: Ten fingers multi touch with pressure sensing
- Interface: I2C

2.2 General Specification

Item	Specification	Unit
Screen Diagonal	7.0	inch
Applied Resolution	800 x 480	dot
Module Outline	100(H) x 164.1(W) x 1.4(T) (Excluded FPC)	mm
Touch Area	(H) x (W)	mm
Cover Lens Material	Glass	-
Transparency	85	%
Origin	-	-
Controller	GT911	-

3.0   ABSOLUTE MAXIMUM RATING

Absolute Maximum rating of touch panel module is as following

Symbol	Parameter	Value	Unit
VCORE	Supply Voltage for Logic	-0.3 to +2.8	V
VDDIO	Supply Voltage for I/O	-0.3 to +3.3	V
TA	Operating Temperature	-20 to +85	°C
TSTG	Storage Temperature	-30 to +85	°C

Note: If the module exceeds the absolute maximum ratings, it may be damaged permanently. Also, if the module operated with the absolute maximum ratings for a long time, its reliability may drop.

4.0   Electrical Characteristics

DC Characteristics (Unless otherwise specified, Voltage Referenced to VSS, TA = -20 to 85°C)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
AVDD	Analog power supply		2.8	-	3.3	V
VDDIO	Digital I/O power supply		1.8	-	3.3	V
IDD	Operating mode current		-	8	14.5	mA
IGR	Green mode current		-	3.3	-	mA
Isleep	Sleep mode current		70	-	120	uA
VOH1	Logic High Output Voltage		0.85*VDDIO	-	-	V
VOL1	Logic Low Output Voltage		-	-	0.15*VDDIO	V
VIH1	Logic High Input voltage		0.75*VDDIO	-	VDDIO+3	V
VIL1	Logic Low Input voltage		-0.3	-	0.25*VDDIO	V

5.0   Pin Definition

| No.	Symbol	I/O	Function
1	RST	I	Sensor system global reset
2	VDD	P	Power supply
3	VSS	P	Ground
4	IRQ	O	Sensor data ready request
5	SDA	I/O	I2C serial data
6	SCL	I	I2C serial clock

6.0   12C Interface

 Touch panel is used as I2C Slave Device, I2C Slave address is 0x14.

6.1   Interface Diagram

    The system block diagram is as shown in below. There are three communication pins connected between CPU and Touch Panel Module which are including external interrupt IRQ, I2C pins SCL and SDA. The IRQ is active low while the touch state is calculated by Touch Panel Module and the touch information can be translated via I2C communication interface. The I2C data format, protocol and report packet are described as following.

Touch Panel Module
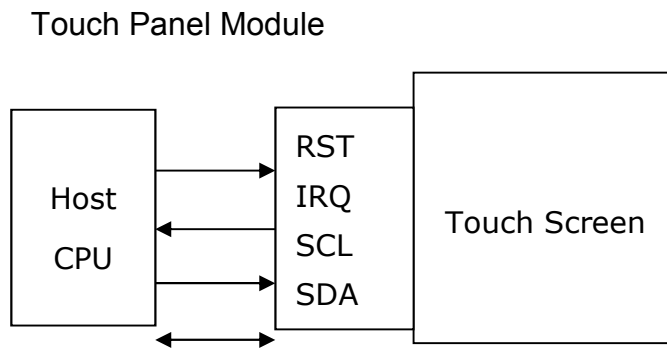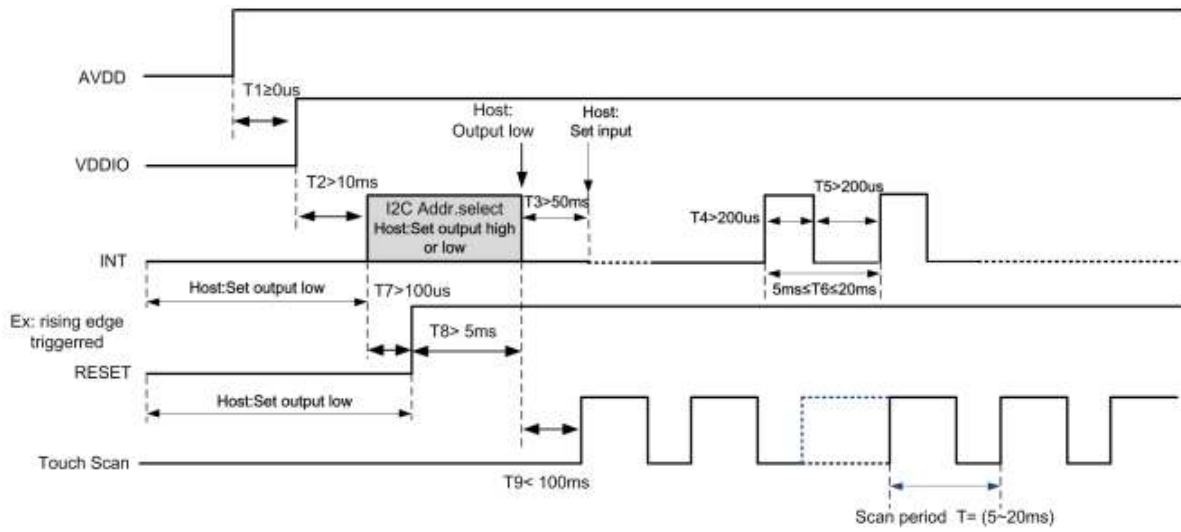

6.2 Timing Characteristic

Conditions:
    VDD - VSS = 2.5 TO 3.3V
    TA = 25°C
    400Kbps transmission rate, 2K pull-up resistor

Symbol	Parameter	Min	Typ	Max	Unit
Tlo	SCL low period	1.3	-	-	us
thi	SCL high period	0.6	-	-	us
tst1	SCL setup time for Start condition	0.6	-	-	us
tst3	SCL setup time for Start condition	0.6	-	-	us
thd1	SCL setup time for Start condition	0.6	-	-	us
tst2	SDA setup time	0.1	-	-	us
thd2	SDA hold time	0	-	-	us

Power On Timing

Timing for Host Resetting