CRYSTAL CLEAR TECHNOLOGY

Product Specification

T1010T03X00

(REVISION2)

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1.0 Table of Contents

2.0 Records of Revision

Rev	Date	Item	Page	Comment	Originator	Checked By
1.0	14.01.16			Initial Release	Azhar	Whong
2.0	19.07.16			Change Temperature specification	Azhar	Liew

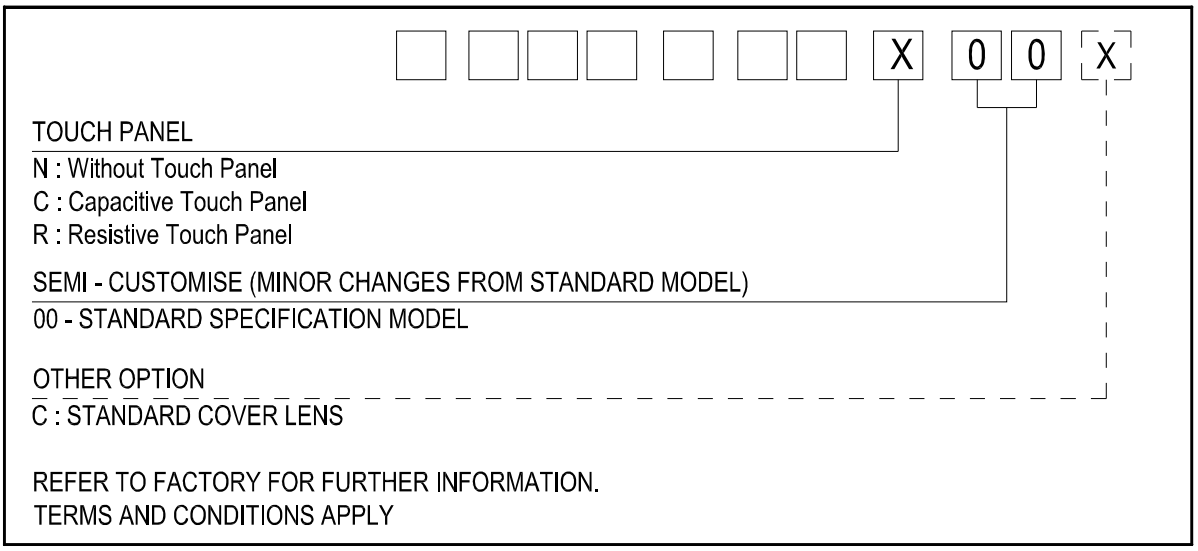
3.0 General Specification

T1010T03X00 is 10.1" color TFT-LCD (Thin Film Transistor Liquid Crystal Display) module composed of LCD panel, driver ICs control circuit, LED backlight. This display area contains 1024 x 600 pixels and can display up to 262K colors. This product compliant with RoHS environmental requirement.

Item	Contents	Unit	Note
LCD Type	10.1" TFT	-	
Display Mode	TN (Normally White)	-	
Color Depth	262K	-	1
Viewing Direction	12	O 'Clock	
Viewing Direction (Grey Scale Inversion)	6	O 'Clock	
Module size	235.. x 143.0 x 5.09	mm	2
Active Area(W×H)	222.72 x 125.28	mm	
Number of Dots	1024(RGB) × 600	dots	
Driver	HX8282A02 + HX8696	-	
Backlight	24 White LEDs	pcs	
Brightness	400 (typ)	cd/m2	3
Interface Mode	LVDS	-	
Data Transfer	RGB	-	

Note1: Color tone is slightly changed by temperature and driving voltage.
Note2: FPC or wire are not included.
Note3: Brightness on LCD surface. Module with CTP or RTP, brightness will be about 20% (max) lower on the touch panel surface.

Available Option



4.0 Absolute Maximum Ratings

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

Item	Symbol	MIN	MAX	Unit	Remark
Digital Supply Voltage	V_{DD}	-0.3	4	V	
Logic Signal Input Voltage	V_{IN}	-0.3	VDD+0.3	V	
Logic Signal Output Voltage	V_{out}	0.3	VDD+0.3	V	

Notes:
(1) In case of below 0°C, the response time of liquid crystal (LC) becomes slower and the color of panel becomes darker than normal one. Level of retardation depends on temperature, because of the LC characteristics.
(2) If product is exposed to high temperatures for extended time, there is a possibility of the polarizer film damage which could degrade the optical characteristics.
(3) Permanent damage to the device may occur if maximum values are exceeded or Reverse voltage is loaded. Functional operation should be restricted to the conditions described under normal operating conditions

4.2 Environmental Absolute Maximum Ratings

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

Notes:

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<=60°C and 70%RH MAX.
   (Ta>=60°C. Absolute humidity must be lower than the humidity of 70%RH at 60°C)

5.0 Electrical Characteristics and Instruction Code

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

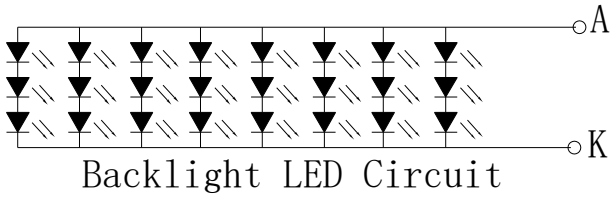
Characteristics	Symbol	Min	Typ	Max	Unit	Note
Power Supply Voltage 1	DVDD	3	3.3	3.6	V	
LVDS Differential Input High Threshold	VTH	-	-	100	mv	
LVDS Differential Input Low Threshold	VTL	-100mV	-	-	mV	
LVDS Common Mode Voltage	VCM	1.125	-	1.375	V	
LVDS Differential Input Voltage	VID	100	-	600	mV	
Terminating Resistor	RT	-	100	-	Ohm	

Note:
1: When an optimum contrast is obtained in transmissive mode.
2: Tested in 1X1 chessboard pattern.

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

Item	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply Voltage	V_{LED}	-	8.4	8.6	9.6	V	1
Supply Current	If	-	-	160	-	mA	2
Led lifetime	If = 160mA		25000				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))



Backlight LED Circuit

5.3 Interface Signal

Pin No	Symbol	I/O	Function
1	NC	-	NC
2 ~ 3	VDD	P	Power Supply
4	NC	-	NC
5	NC	-	NC
6	NC	-	NC
7	NC	-	NC
8	Rxin0-	I	LVDS Differential Data input
9	Rxin0+	I	LVDS Differential Data input
10	GND	P	Ground
11	Rxin1-	I	LVDS Differential Data input
12	Rxin1+	I	LVDS Differential Data input
13	GND	P	Ground
14	Rxin2-	I	LVDS Differential Data input
15	Rxin2+	I	LVDS Differential Data input
16	GND	P	Ground
17	RxCLK-	I	LVDS Differential Clock input
18	RxCLK+	I	LVDS Differential Clock input
19	GND	P	Ground
20	NC	-	NC
21	NC	-	NC
22	GND	P	Ground
23	NC	-	NC
24	NC	-	NC
25	GND	P	Ground
26	NC	-	NC
27	NC	-	NC
28	GND	P	Ground
29	NC	-	NC
30	NC	-	NC
31	NC	-	NC
32	NC	-	NC
33	NC	-	NC
34	NC	-	NC
35	NC	-	NC
36	NC	-	NC
37	NC	-	NC
38	NC	-	NC
39	NC	-	NC
40	NC	-	NC

6.0 AC Characteristics

6.1 Power On/Off Sequence

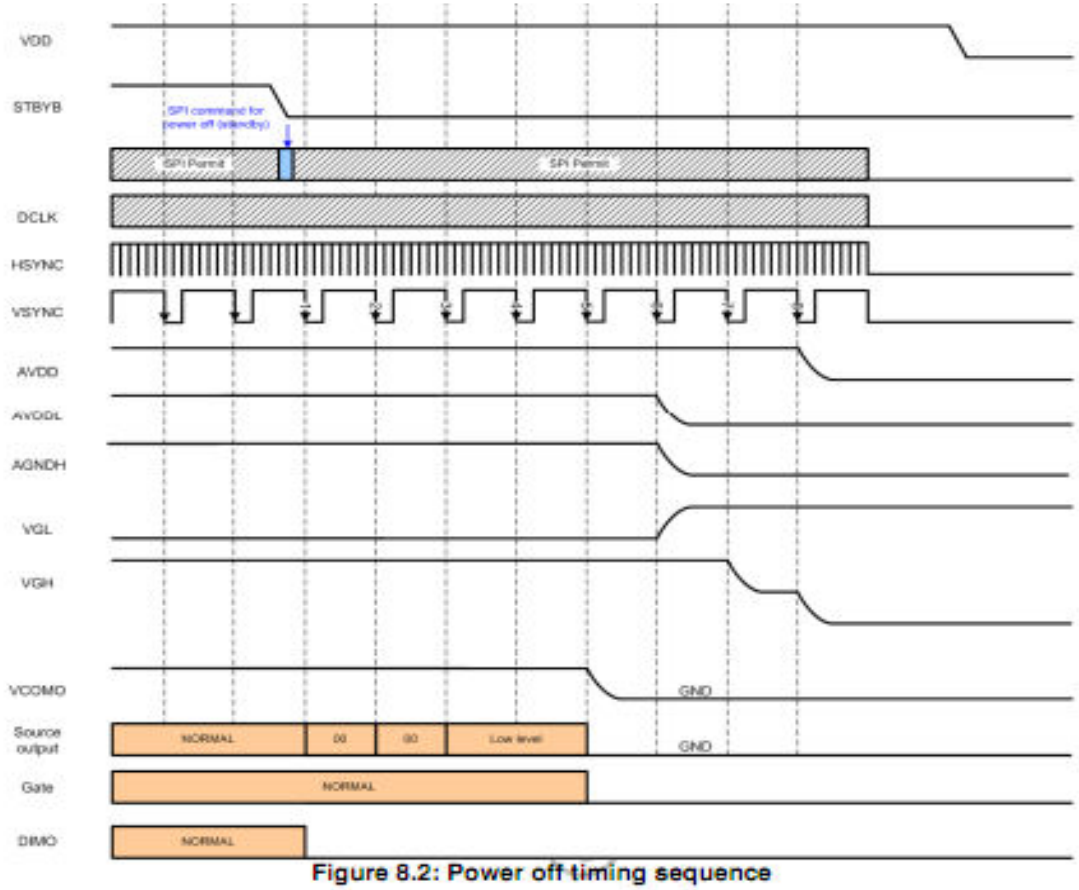
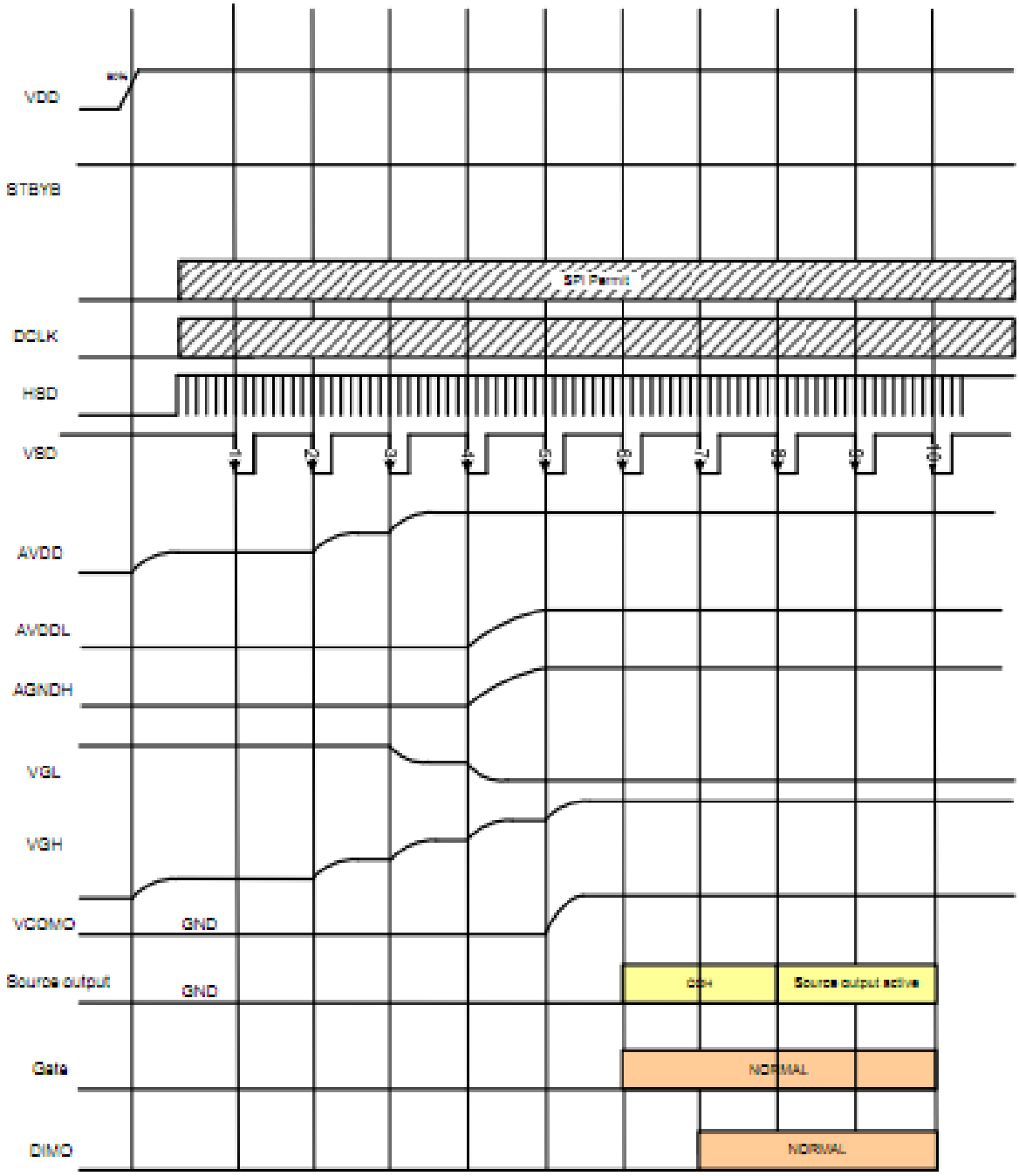


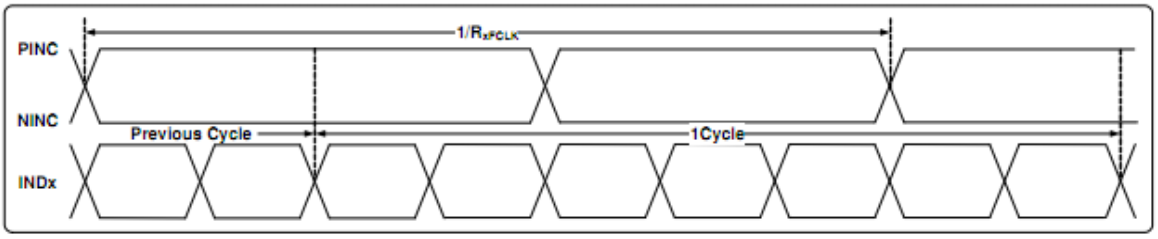
Figure 8.2: Power off timing sequence

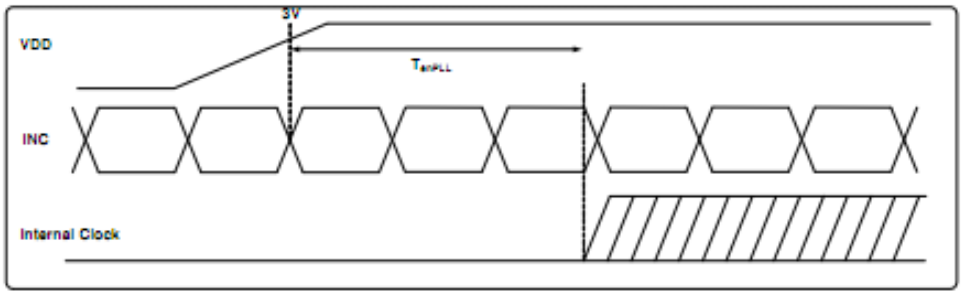
Note: Low level=3FH, when NBW=L (Normally white)
Low level=00H, when NBW=H (Normally black)


VDD
STBYB
DCLK
HSD
VSD
AVDD
AVDDL
AGNDH
VGL
VGH
VCOMO
GND
Source output
GND
Source output active
Gate
NORMAL
DIMO
NORMAL

6.2 LVDS mode DC Electrical Characteristics

Parameter	Symbol	Spec. Min.	Spec. Typ.	Spec. Max.	Unit	Condition
Clock frequency	R_{XFCLK}	20	-	71	MHz	-
Input data skew margin	T_{RSKM}	500	-	-	pS	$\|V_{ID}\|$=400mV R_{XVCM}=1.2V R_{XFCLK}=71MHz
Clock high time	T_{LVCH}	-	4/(7* R_{XFCLK})	-	ns	-
Clock low time	T_{LVCL}	-	3/(7* R_{XFCLK})	-	ns	-
PLL wake-up time	T_{emPLL}	-	-	150	µs	-





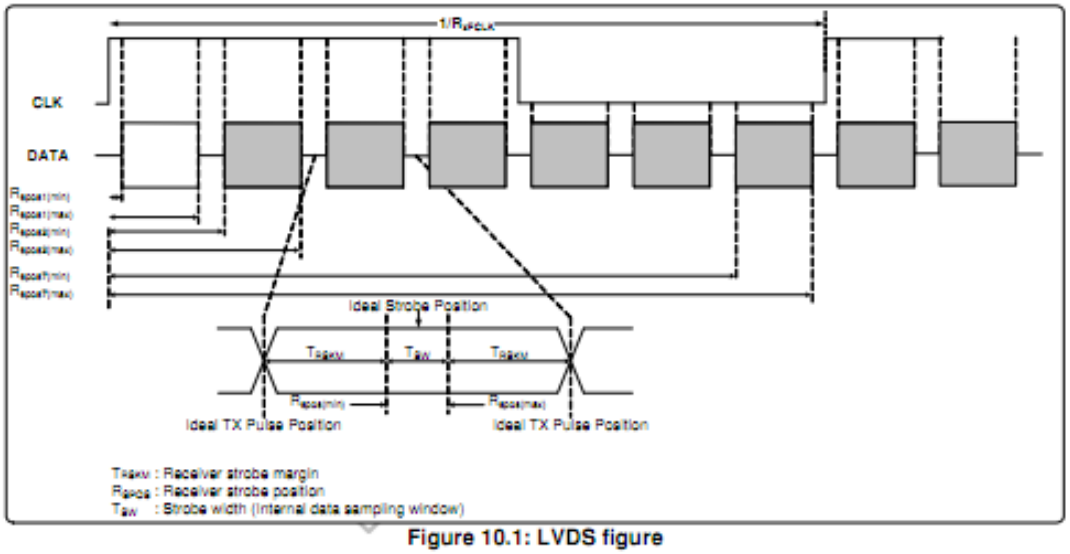


Figure 10.1: LVDS figure

Parameter	Symbol	Spec. Min.	Typ.	Max.	Unit	Condition
Modulation Frequency	SSC_{MF}	23	-	93	KHz	-
Modulation Rate	SSC_{MR}	-	-	±3	%	LVDS clock =71MHz center spread

Parameter	Symbol	Spec. Min.	Typ.	Max.	Unit	Condition
Differential input high Threshold voltage	R_{XVTH}	-	-	+0.1	V	R_{XVCM}=1.2V
Differential input low threshold voltage	R_{XVTL}	-0.1	-	-	V	
Input voltage range (singled-end)	R_{XVIN}	0	-	VDD-1.2+ $\|V_{ID}\|/2$	V	-
Differential input common Mode voltage	R_{XVCM}	$\|V_{ID}\|/2$	-	VDD-1.2	V	-
Differential input voltage	$\|V_{ID}\|$	0.2	-	0.6	V	-
Differential input leakage Current	RV_{XIlz}	-10	-	+10	µA	-
LVDS Digital Operating Current	Iddlvds	-	15	30	mA	Fclk=65MHz, VDD=3.3V
LVDS Digital Stand-by Current	Istlvds	-	10	50	µA	Clock & all Functions are stopped

Table: LVDS mode DC electrical characteristics

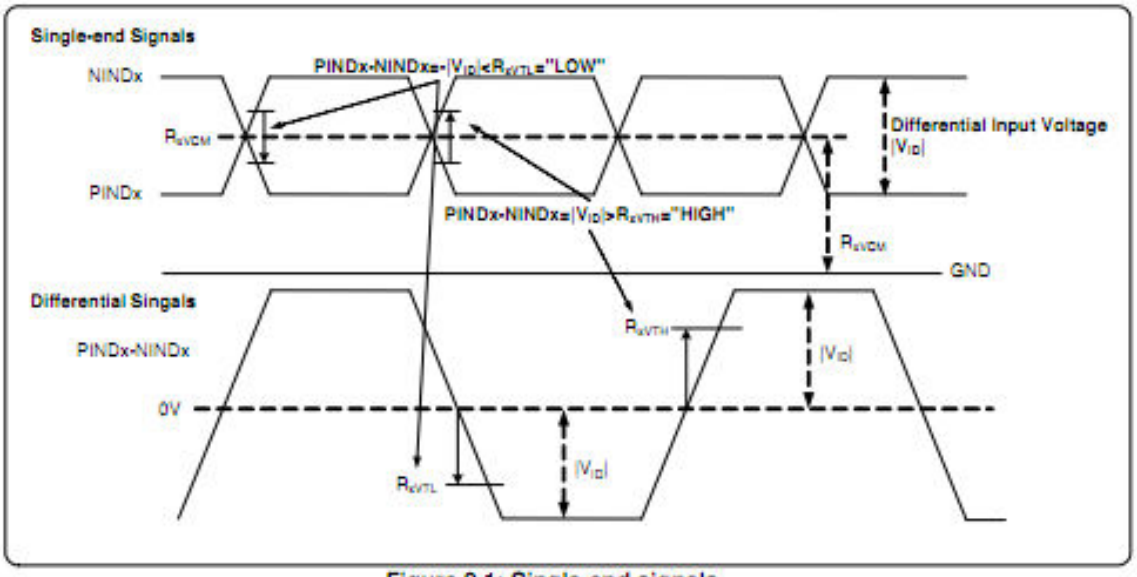


Figure 9.1: Single-end signals

6.3 LVDS mode data input format

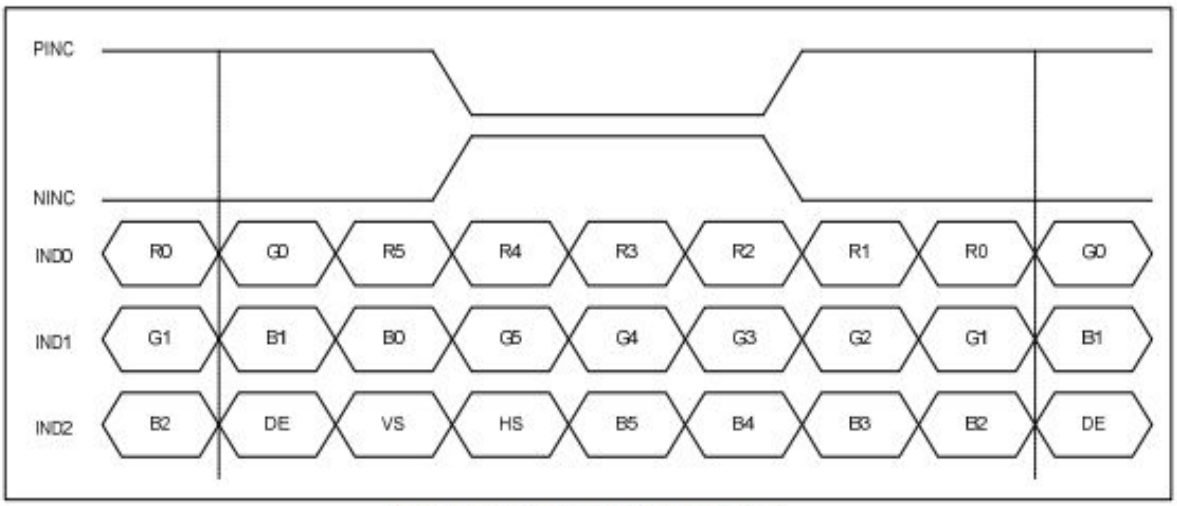


Figure 10.4: 6-bit LVDS input

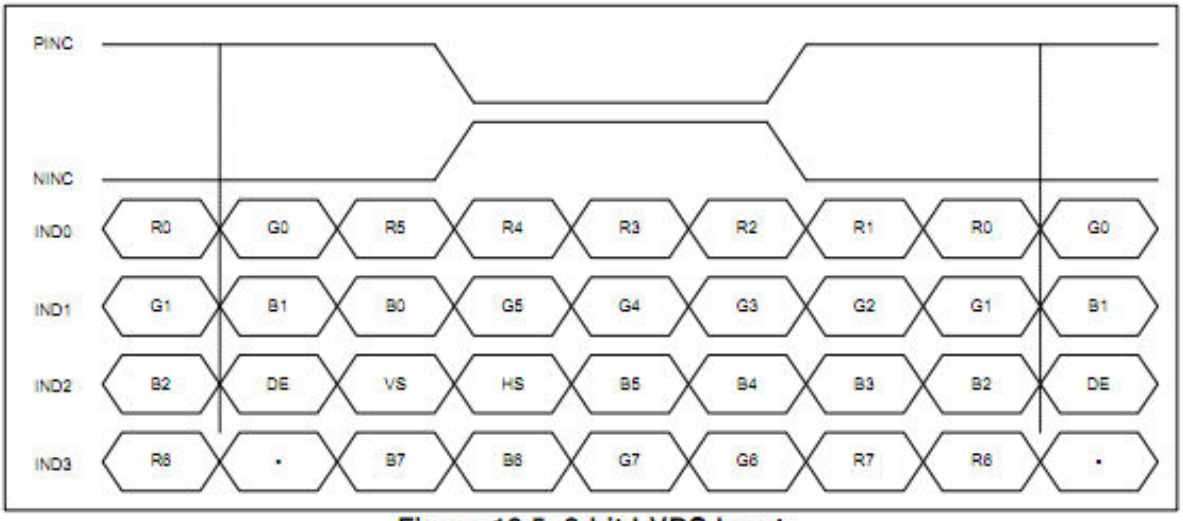


Figure 10.5: 8-bit LVDS Input

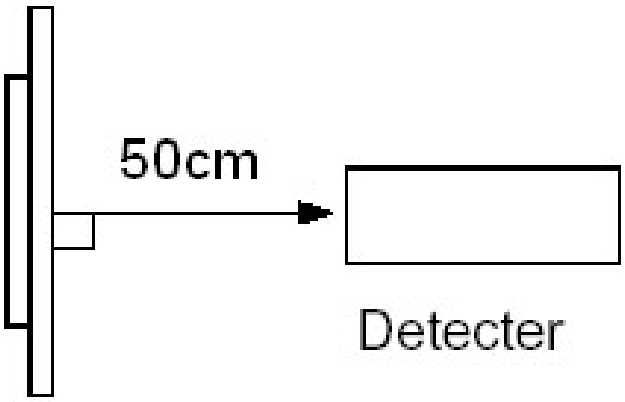
7.0 Optical Characteristics

Items		Symbol	Condition	Min	Typ	Max	Unit	Remark
Response Time		Tr + Tf	Θ = 0° Ø = 0° Ta = 25°C	-	8	-	ms	Note5
Contrast Ratio		Cr		-	500	-	-	Note4
Uniformity		Δ White		80	-	-	%	Note2
Surface Luminance		Lv		350	400	-	cd/m2	Note1
Viewing Angle		θ_3 = X+	CR>10	-	70	-	°	Note3
		θ_9 = X-		-	70	-		
		θ_{12} = Y+		-	60	-		
		θ_6 = Y-		-	70	-		
CIE (X, Y) Chromaticity	White	X_W	Θ = 0° Ø = 0° Ta = 25°C	0.280	0.310	0.340	-	Note6
		Y_W		0.307	0.337	0.367	-	
	Red	X_R		0.596	0.626	0.656	-	
		Y_R		0.312	0.342	0.372	-	
	Green	X_G		0.273	0.303	0.333	-	
		Y_G		0.526	0.556	0.586	-	
	Blue	X_B		0.106	0.136	0.166	-	
		Y_B		0.109	0.139	0.169	-	

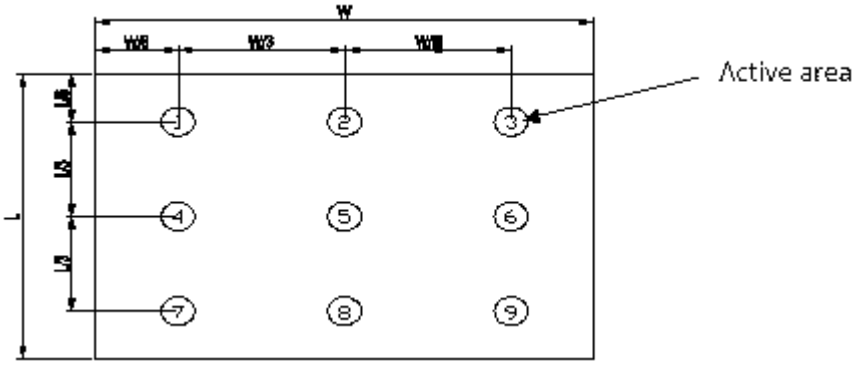
Note: The parameter is slightly changed by temperature, driving voltage and materiel

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 center of the display.

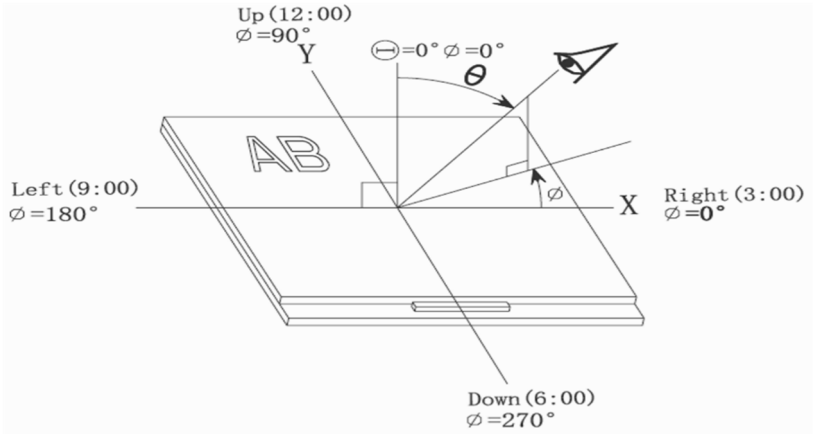
Measured value at the center point of LCD panel after more than 5 minutes while backlight turning on.



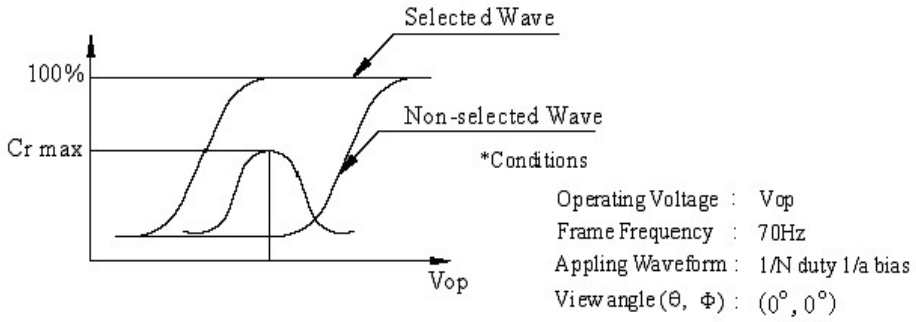
Note 2: The luminance uniformity is calculated by using following formula.
⊿Bp = Bp (Min.) / Bp (Max.)×100 (%)
Bp (Max.) = Maximum brightness in 9 measured spots Bp (Min.) = Minimum brightness in 9 measured spots.



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



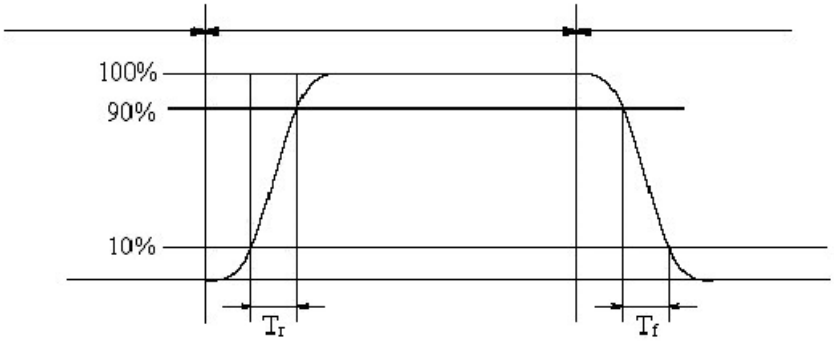
Note 4: Definition of contrast ratio. (Test LCD using DMS501)



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

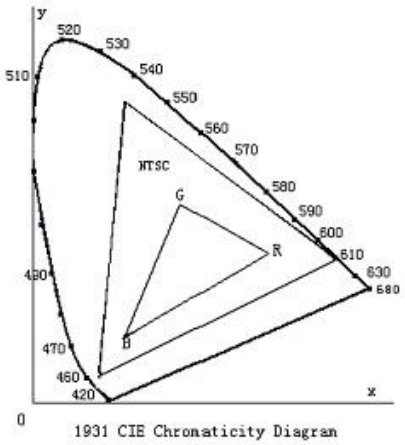
Note 5: Definition of Response time. (Test LCD using DMS501):

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

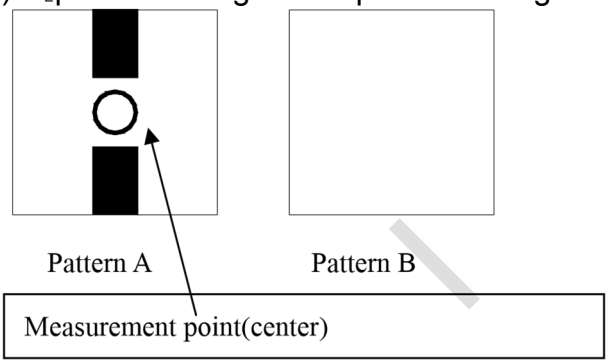
Note 6: Definition of Color of CIE Coordinate and NTSC Ratio.



1931 CIE Chromaticity Diagram

Note 7: Definition of cross talk.

Cross talk ratio (%) =[pattern A Brightness-pattern B Brightness]/pattern A



Electric volume value = 3F+/-3Hex

8.0 Reliability Test Condition

Item		Test Condition
Operating	High Temperature	70degC, 96 hrs
	Low Temperature	-20 degC,96 hrs
Storage	High Temperature	80degC, 96hrs and recovery for 2hrs
	Low Temperature	-30degC, 96hrs and recovery for 2hrs
	High Temperature and High Humidity	60degC, 70%RH, 96hrs and recovery for 2 hrs
Thermal	Cycle	Rt → -30degV → Rt → 80degC → RT 0min 30min 5min 30min 5min 50 cycles (Power off)
	Shock	Rt → -30degV → 80degC 0min 30min 30min 50 cycles (Power off)

Note: Rt means Room temperature

9.0 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.

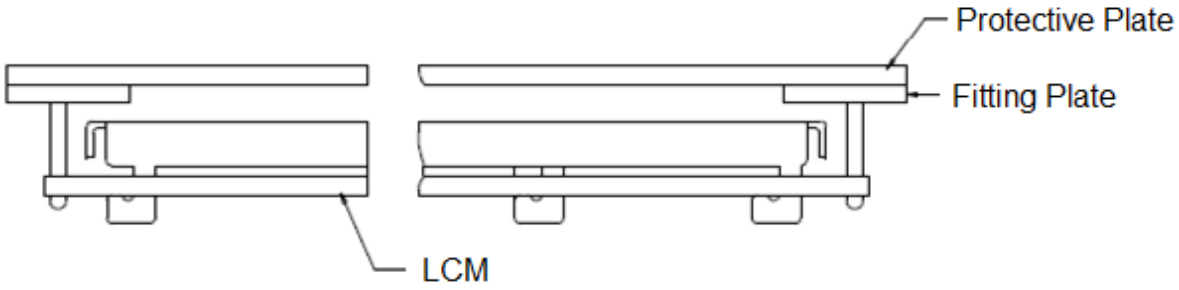
Exposed area of the printed circuit board.
Terminal electrode sections.

4. Using LCD Modules

a. Installing LCD Modules

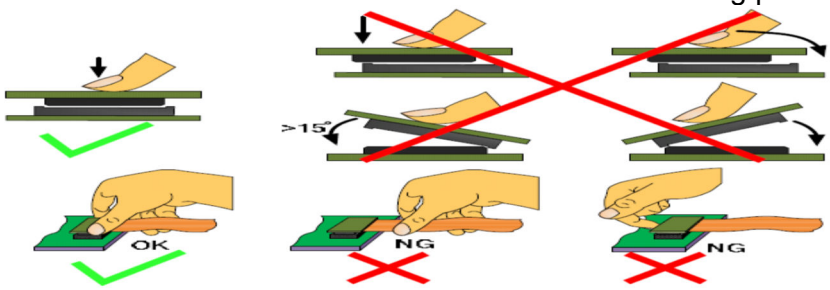
The hole in the printed circuit board is used to fix LCM as shown in the picture below.
Attend to the following items when installing the LCM.

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 color 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.

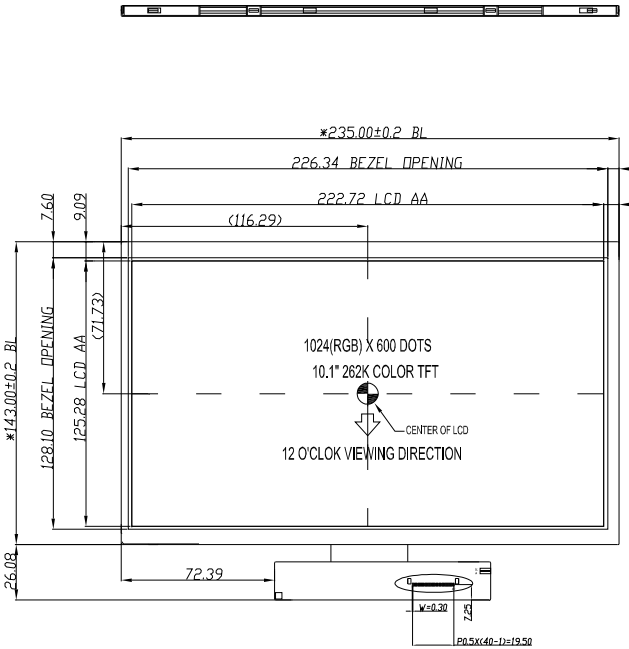
8. Limited Warranty

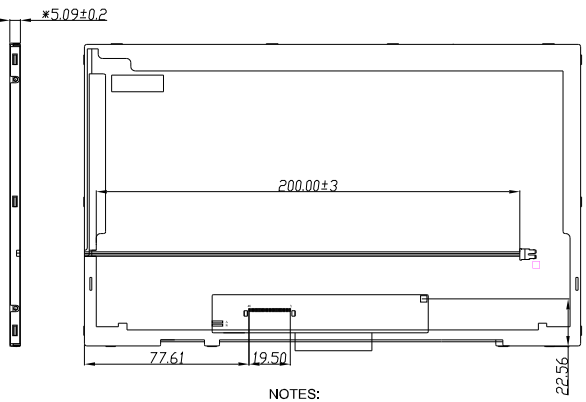
   Unless otherwise agreed between Crystal Clear Technology and customer, Crystal Clear Technology will replace or repair any of its LCD and LCM which is found to be defective electrically and visually when inspected in accordance with Crystal Clear Technology acceptance standards, for a period of one year 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.

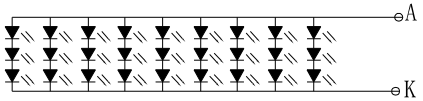




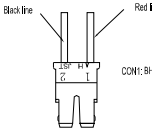
PCB ASSIGNMENT:

1	NC
2	VDD
3	VDD
4	VEDID
5	NC
6	CLK-EDID
7	DATA-EDID
8	RXIN0-
9	RXIN0+
10	GND
11	RXIN1-
12	RXIN1+
13	GND
14	RXIN2-
15	RXIN2+
16	GND
17	RXCLKIN-
18	RXCLKIN+
19	GND
20	NC
21	NC
22	GND
23	NC
24	NC
25	GND
26	NC
27	NC
28	GND
29	NC
30	NC
31	NC/LED_GND
32	NC/LED_GND
33	NC/LED_GND
34	NC
35	LED_PWM
36	LED_EN
37	NC
38	NC/LED_VDD
39	NC/LED_VDD
40	NC/LED_VDD

NOTES:
1. DISPLAY TYPE: 10.1",Transmissive,Normal White,262K
2. BACKLIGHT: 27 CHIP WHITE LED, IN PARALLEL
   3LEDs Serial 9 line,Vf=10V(If=180mA)
3. INTERFACE: LVDS & FPC
4. VIEWING DIRECTION: 12 O'CLOCK
5. GSI DIRECTION: 6 O'CLOCK
6. OPERATING TEMP: -0°C~+50°C
7. STORAGE TEMP: -20°c~+60°c
8. RESOLUTION: 1024RGB*600
9. LCD IC: HX 8282A02+HX8696
10. Backlight luminance :200cd/m^2
11. "( )"reference dimension. " * "critical dimension
12. RoHS Compliant



Backlight LED Circuit



CON:	
1	LEDA
2	LEDK

MODEL NAME	NO	MATERIAL	REMARKS

CRYSTAL CLEAR TECHNOLOGY SDN BHD
16, JLN TP5, TMN PERINDUSTRIAN SIME UEP,
47500 SUBANG JAYA, SELANGOR DARUL EHSAN.

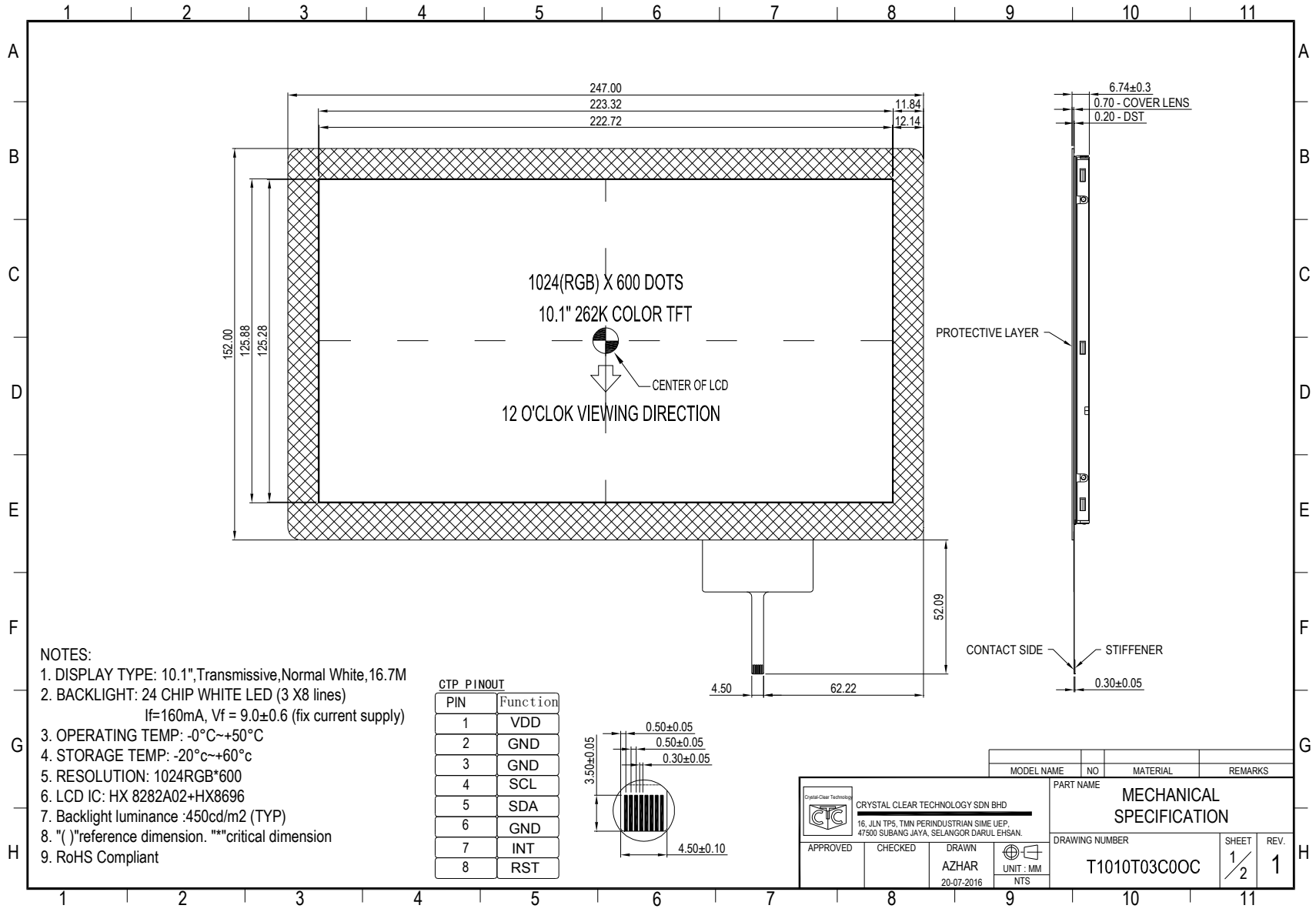
PART NAME: MECHANICAL SPECIFICATION

APPROVED	CHECKED	DRAWN	UNIT : MM
		SYEIFIZUL 22-01-2016	NTS

DRAWING NUMBER: T1010B03N00

SHEET: 1/1

REV.: 1



NOTES:
1. DISPLAY TYPE: 10.1",Transmissive,Normal White,16.7M
2. BACKLIGHT: 24 CHIP WHITE LED (3 X8 lines)
   If=160mA, Vf = 9.0±0.6 (fix current supply)
3. OPERATING TEMP: -0°C~+50°C
4. STORAGE TEMP: -20°c~+60°c
5. RESOLUTION: 1024RGB*600
6. LCD IC: HX 8282A02+HX8696
7. Backlight luminance :450cd/m2 (TYP)
8. "( )"reference dimension. "*"critical dimension
9. RoHS Compliant

CTP PINOUT

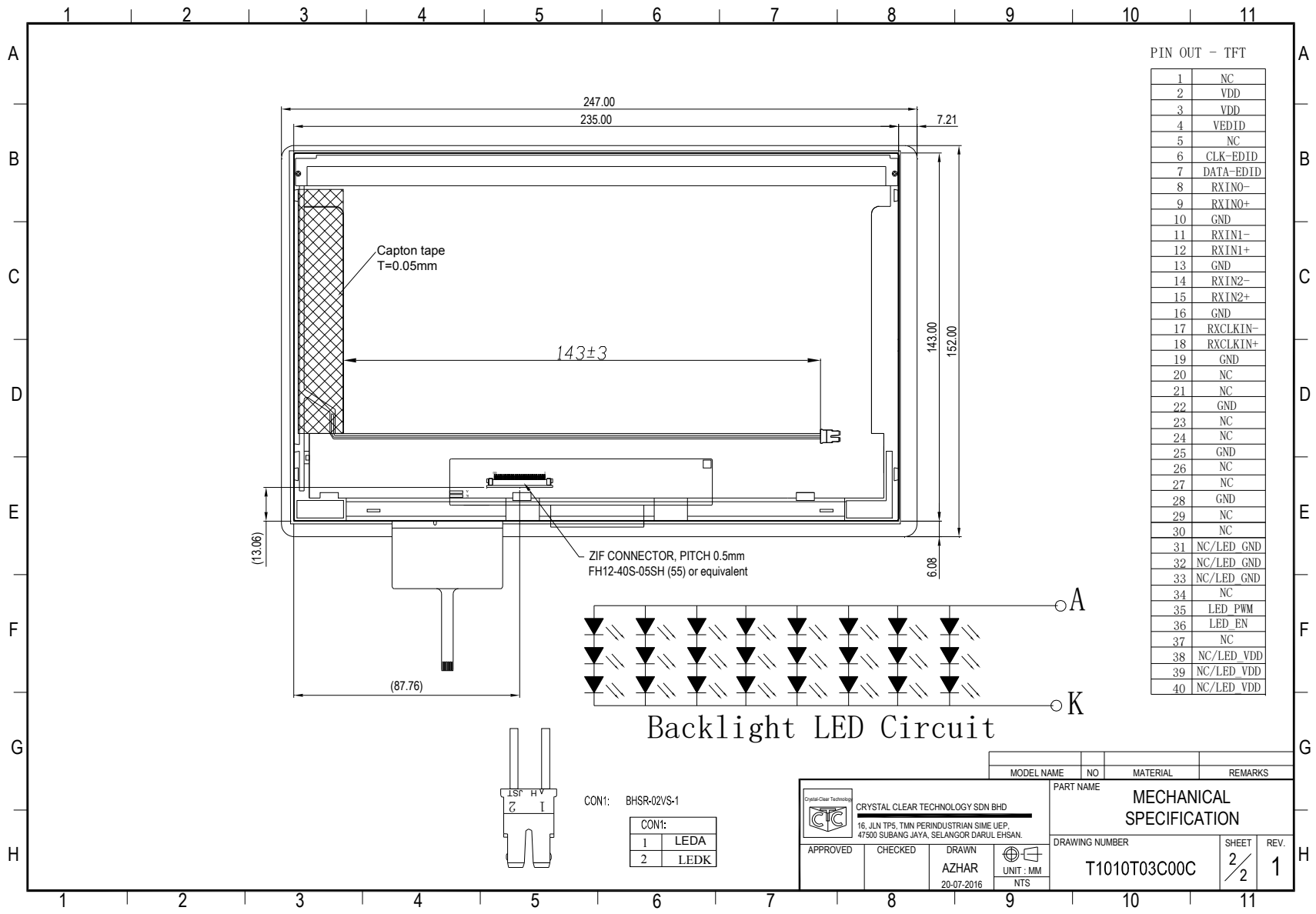
PIN	Function
1	VDD
2	GND
3	GND
4	SCL
5	SDA
6	GND
7	INT
8	RST

MODEL NAME	NO	MATERIAL	REMARKS

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	UNIT : MM	DRAWING NUMBER	SHEET	REV.
		AZHAR 20-07-2016	NTS	T1010T03C0OC	1/2	1


247.00
235.00
7.21
Capton tape
T=0.05mm
143±3
143.00
152.00
(13.06)
ZIF CONNECTOR, PITCH 0.5mm
FH12-40S-05SH (55) or equivalent
6.08
(87.76)
A
K
Backlight LED Circuit
CON1: BHSR-02VS-1
CON1:
1 LEDA
2 LEDK
PIN OUT - TFT
1 NC
2 VDD
3 VDD
4 VEDID
5 NC
6 CLK-EDID
7 DATA-EDID
8 RXIN0-
9 RXIN0+
10 GND
11 RXIN1-
12 RXIN1+
13 GND
14 RXIN2-
15 RXIN2+
16 GND
17 RXCLKIN-
18 RXCLKIN+
19 GND
20 NC
21 NC
22 GND
23 NC
24 NC
25 GND
26 NC
27 NC
28 GND
29 NC
30 NC
31 NC/LED_GND
32 NC/LED_GND
33 NC/LED_GND
34 NC
35 LED_PWM
36 LED_EN
37 NC
38 NC/LED_VDD
39 NC/LED_VDD
40 NC/LED_VDD
MODEL NAME
NO
MATERIAL
REMARKS
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
AZHAR
20-07-2016
UNIT : MM
NTS
DRAWING NUMBER
T1010T03C00C
SHEET
2/2
REV.
1

Attachment 1.

Capacitive Touch Panel Specification

Contents

1. General Specification

Item	CONTENTS	Unit
Outline Dimension	247*152	mm
Active Area(W*L)	224.32*126.88	mm
View Area	223.32*125.88	mm
TP size (inch)	10.1	inch
Interface Type	IIC	-
Number of touch point	1024x768(5Point)	Dot
Number of button	--	-
Operation Temperature	TOPL = -20, TOPH =70	℃
Storage Temperature	TSTL = -30, TSTH =80	℃
ITO Glass thickness ITO	0.7	mm
Cover lens thickness	0.7	mm
Resolution	>100 dpi	
Input force	<10g	
Surface hardness	>6H	

2. Electrical Characteristics (Ta＝25□)

Item	Symbol	Condition	Min.	Type	Max.	Unit
Power SupplY	VCC	--	2.8	3.3	3.5	Volt
Supply Current	IDD	Vcc =3.3V Free mode	--	16.5	35	mA
		Vcc =3.3V watch mode	-	16.5	35	mA
		Vcc =3.3V Active mode	-	18.5	40	mA
		Vcc =3.3V Fast mode	-	18.5	40	mA

3. Optical Characteristics

Item	CONTENTS	Remark
Transparency	>87%	

4. Reliability

No.1	Test Items	Test Condition	Remark
1	High Temperature Storage Test	Ta= 70℃ 240 hours	(1),(2)
2	Low Temperature Storage Test	Ta= -30℃ 240 hours	(1),(2)
3	High Temperature Operation Test	Ta= 70℃ 24 hours	(1),(2)
4	Low Temperature Operation Test	Ta= -20℃ 24 hours	(1),(2)
5	High Temperature and High Humidity Operation Test	Ta=60℃ 90%RH 240 hours (Without dewing)	(1),(2)
6	Thermal Shock Test (non-operating)	-20℃(30min) ~ 70℃(30min), 10 cycles	(1),(2)

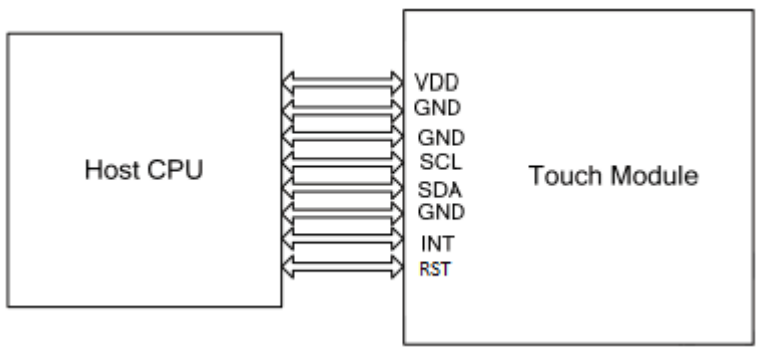
Note:

(1) After the reliability test, the product should work functionally.

(2)Before visual and function test, the product should be given at least 2 hours at room temperature to normalize.

6. Touch panel description

6.1 Block diagram



6.2 Touch panel pin assignment

Pin	Symbol	Description
1	VDD	Power supply
2	GND	Power ground.
3	GND	Power ground.
4	SCL	IIC clock signal. Must be pulled high.
5	SDA	IIC data signal. Must be pulled high.
6	GND	Power ground.
7	INT	External interrupt to the host
8	RST	External Reset, Low is active