

LCM Specification

Preliminary specification

Final Specification

Project No. 项目编号	TFT-H070A7WSIFT8N40		
Customer 客户名称			
Module No. 客户型号			
Product type 产品内容	TFT LCD Module 1024x 3RGB x 600Dots 7.0" TFT LCD		
Signature by customer: 客户确认签章:			
<input type="checkbox"/> Trial production		<input type="checkbox"/> Mass production	
编 制	电子审核	结构审核	批 准
Y. L			

深圳市鑫洪泰电子科技有限公司

Shenzhen Hot Display Technology Co., Ltd

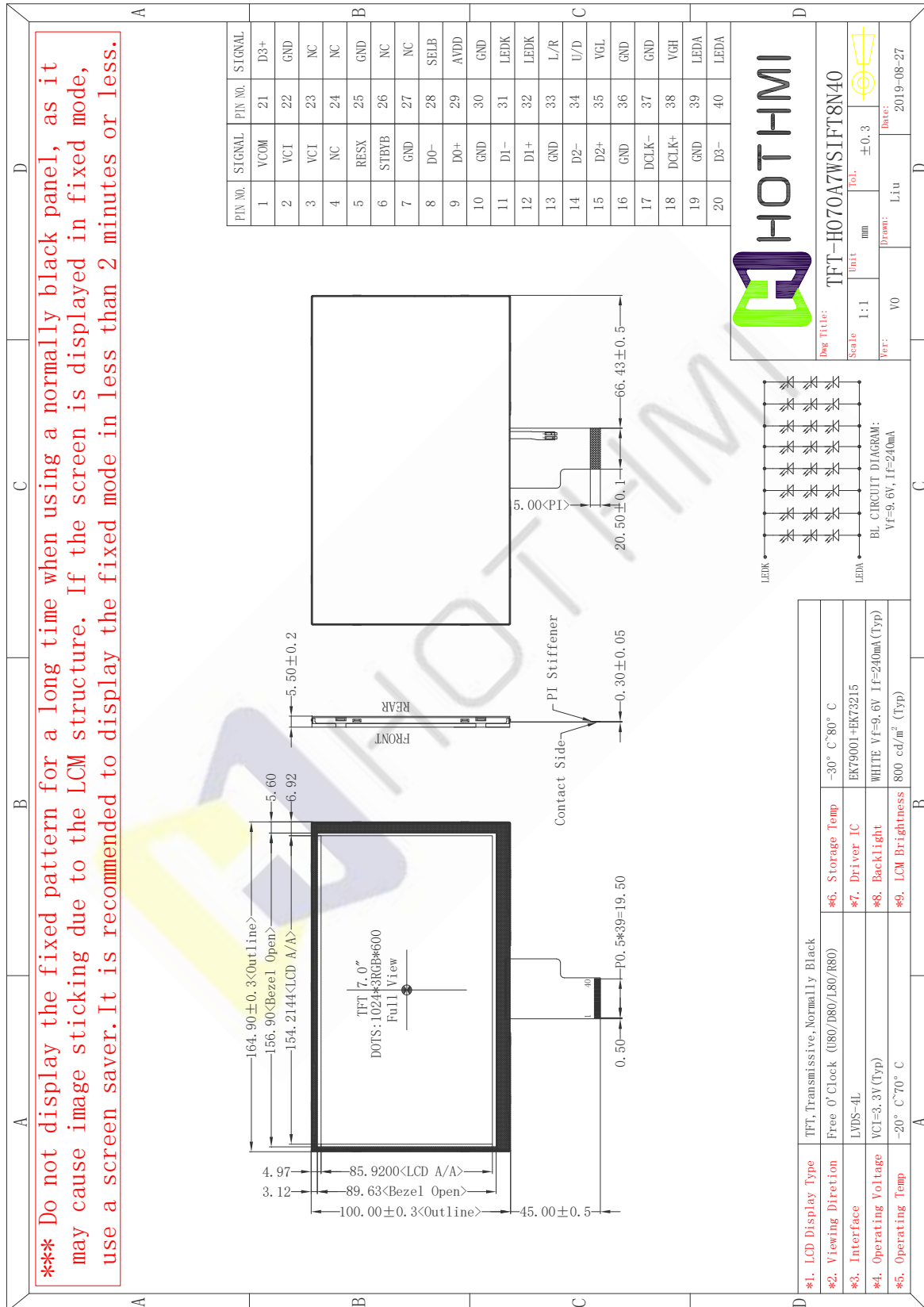
1 Document revision history :

DOCUMENT REVISION	DATE	DESCRIPTION	PREPARED BY	APPROVED BY
0	2019-8-27	First Release.	Y.L	

1. General Feature:

Item	Standard Value	Unit
Display Size	7.0"	--
Number of Pixels	1024(H)x3(RGB)*600(V)	--
Active Area	154.2144(H) *85.92(V)	mm
Outline Dimension	164.90(H) ×100.00× 5.50(V)	mm
Viewing Direction	FULL O'Clock	-
Interface	LVDS	-
Panel Driver IC	EK79001+EK73215	-
Panel Driver Condition	VDD=3.3V	V
Backlight	White LED	-
Touch Panel	Whitout Touch Panel	-
Cap Touch Driver IC	---	-
Cap Touch Driver Condition	---	V
Operation Temperature	-20~70	°C
Storage Temperature	-30~80	°C

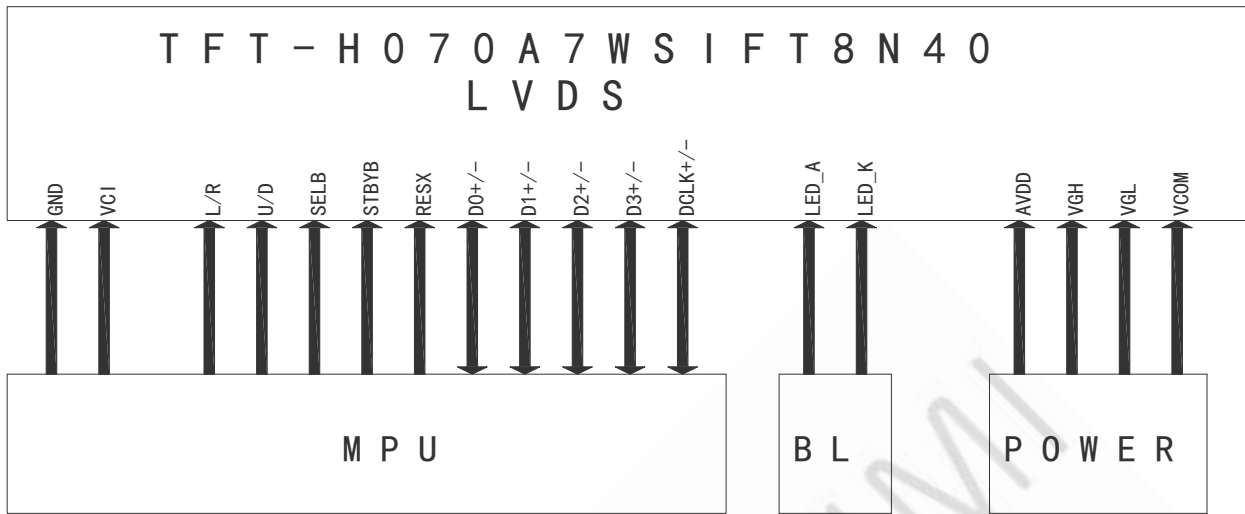
2.Outline Dimensions



3. Pin Description

3.1	Symbol	Description
1	VCOM	TFT Common voltage
2-3	VCI	Analog Power(2.5 ~ 3.6 V)
4	NC	Not connect
5	RESX	Global reset pin.
6	STBYB	Standby mode , Normally pulled high.
7	GND	Ground
8	D0-	Negative LVDS differential data inputs
9	D0+	Positive LVDS differential data inputs
10	GND	Ground
11	D1-	Negative LVDS differential data inputs
12	D1+	Positive LVDS differential data inputs
13	GND	Ground
14	D2-	Negative LVDS differential data inputs
15	D2+	Positive LVDS differential data inputs
16	GND	Ground
17	DCLK-	Negative LVDS differential clock inputs
18	DCLK+	Positive LVDS differential clock inputs
19	GND	Ground
20	D3-	Negative LVDS differential data inputs
21	D3+	Positive LVDS differential data inputs
22	GND	Ground
23-24	NC	Not connect
25	GND	Ground
26-27	NC	Not connect
28	SELB	6bit/8bit mode select H:6bit/L:8bit
29	AVDD	Power for Analog Circuit
30	GND	Ground
31-32	LED_K	LED Cathode
33	L/R	Source Right or Left sequence control. Normally pull high.
34	U/D	Gate Up or Down scan control. Normally pull low.
35	VGL	TFT Gate OFF Voltage
36-37	GND	Ground
38	VGH	TFT Gate ON Voltage
39-40	LED_A	LED Anode(+9.6V/240mA)
-END-		

3.2 Wiring Diagram



4. OPTICAL SPECIFICATION

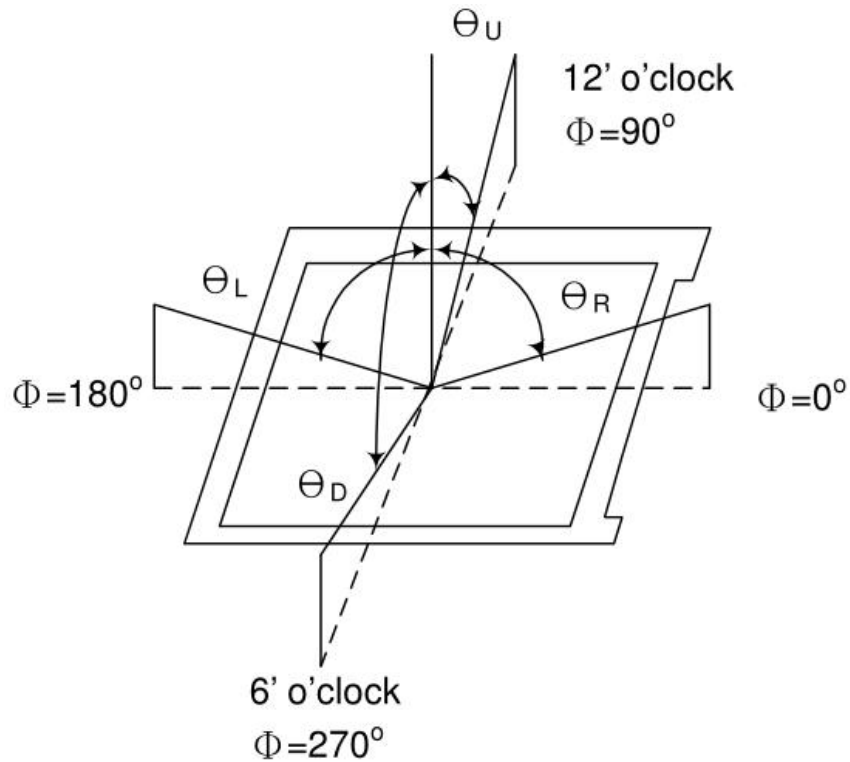
4.1 Overview

The test of Optical specifications shall be measured in a dark room (ambient luminance 1lux and temperature = 25 ± 2°C) with the equipment of Luminance meter system (Goniometer system and TOPCON BM-5) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and Φ equal to 0°. The center of the measuring spot on the Display surface shall stay fixed. The backlight should be operating for 30 minutes prior to measurement.

4.2 Optical Specifications

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle Range	Horizontal	\ominus L	CR>10	80	85	-	Deg.	Note (1)
		\ominus R		80	85	-	Deg.	
	Vertical	\ominus U		80	85	-	Deg.	
		\ominus D		80	85	-	Deg.	
Contrast ratio		CR	$\ominus = 0^\circ$	600	800	-		Note (1) (2)
Color Gamut		CG		-	50	-	%	(C-light)
White Chromaticity		Wx		-	0.319	-		Note (1) (Based on C Light)
		Wy		-	0.341	-		
Reproduction of color	Red	Rx	$\ominus = 0^\circ$	-	0.614	-		
		Ry		-	0.326	-		
	Green	Gx		-	0.335	-		
		Gy		-	0.536	-		
	Blue	Bx		-	0.137	-		
		By		-	0.145	-		
Response Time (Rising + Falling)		Tr+Tf	$\ominus = 0^\circ$ Ta= 25°C	-	25	-	ms	(1)(3)
Transmittance		Tr		-	3.9	-	%	

Note (1) Definition of Viewing Angle:

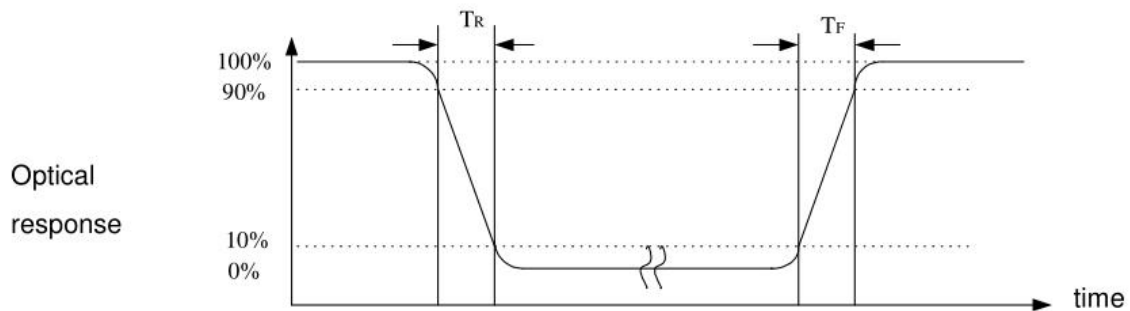


Note (2) Definition of Contrast Ratio(CR) :

measured at the center point of panel

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

Note (3) Definition of Response Time : Sum of T R and T F



5. Electrical Characteristics

5-1 TFT LCD Module Operating Conditions

Item	Symbol	Condition	Min	Type	Max	Unit
Analog Power supply	VCI	-	2.70	3.3	3.6	V
Analog Power	AVDD	-	8.9	9.0	9.1	V
TFT Gate on voltage	VGH	-	17	18	19	V
TFT Gate off voltage	VGL	-	-6.5	-6.0	-5.5	V
TFT Common Voltage	VCOM	-	3.0	3.15	3.3	V

Note:

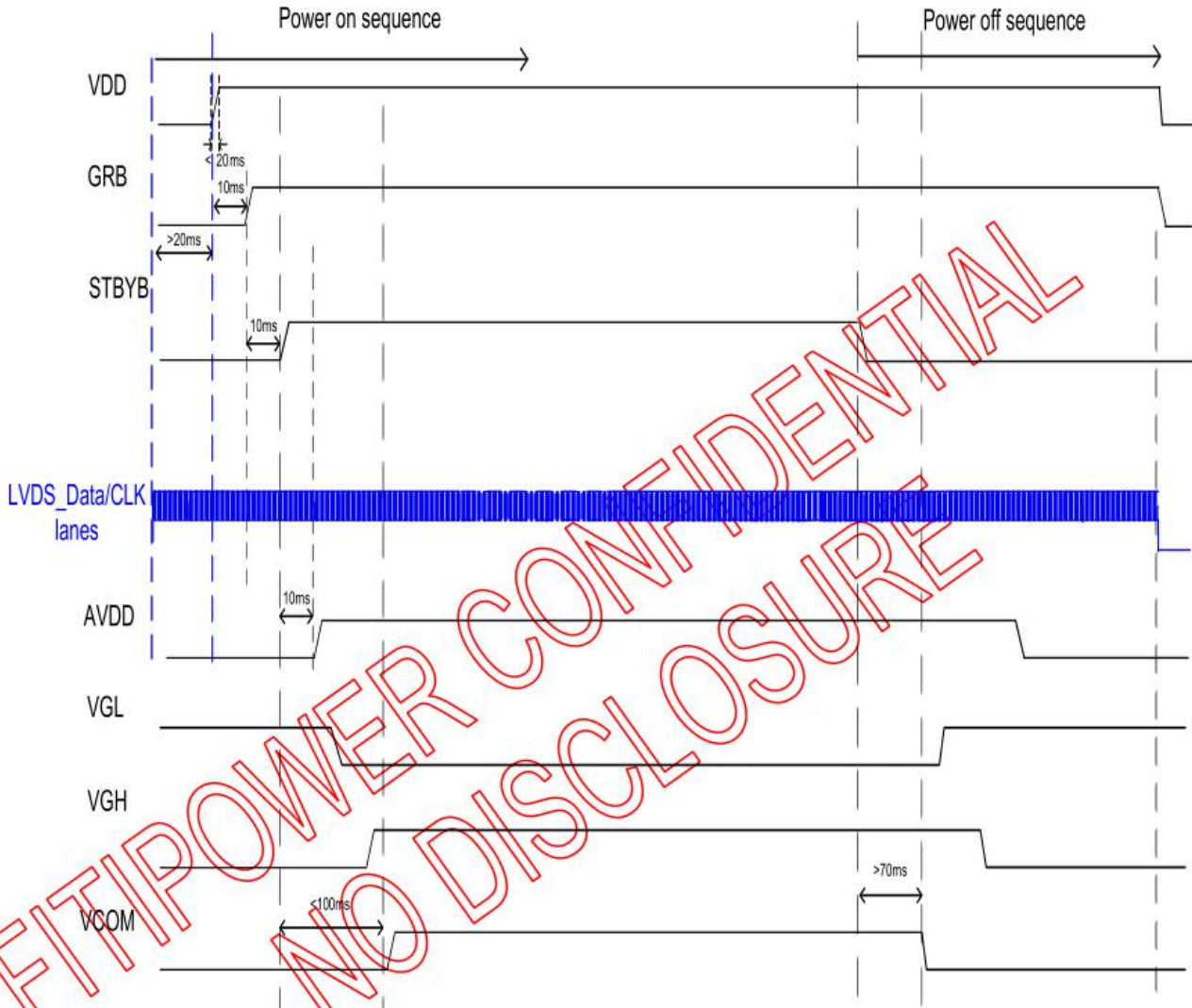
***1. The above drive voltage values are provided by LCD SPEC**

5-2 LED back light specification

Item	Symbol	Condition	Min	Type	Max	Unit
Forward voltage	Vt	If=20mA	-	9.6	-	V
Forward current	Ipn	/1-chip	-	240	-	mA
Luminance(With LCD)	Lv	If=240mA	-	800	-	cd/m ²
Luminous color	White					

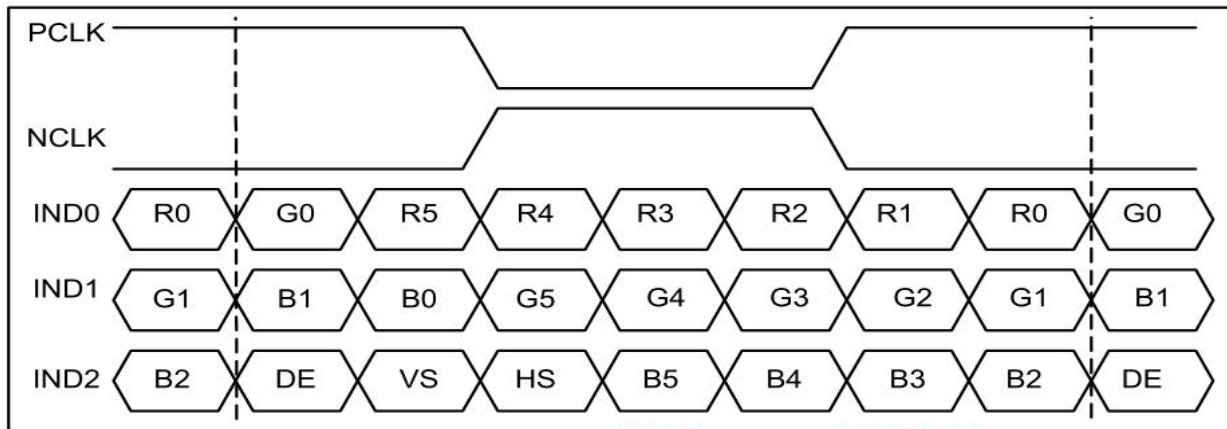
6. Timing Characteristics of Input Signals

6-1 Power-On/Off Timing Sequence for LVDS Interface

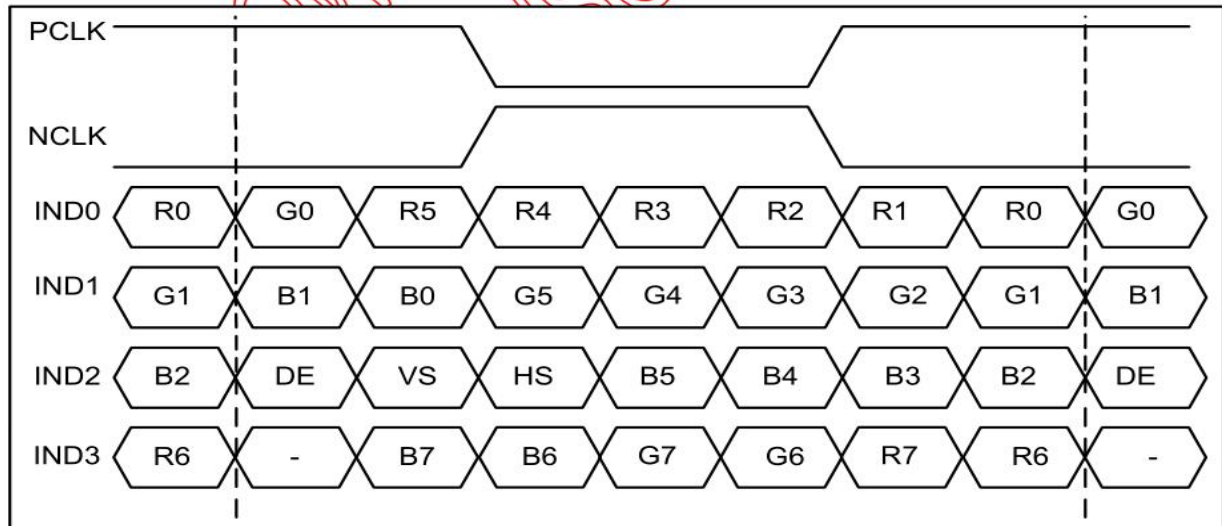


6-2 Data Input Format for LVDS

6-2-1 6-bit LVDS input (SETB="H")



6-2-2 8-bit LVDS input (SETB="L")



6-2-3 Horizontal input timing

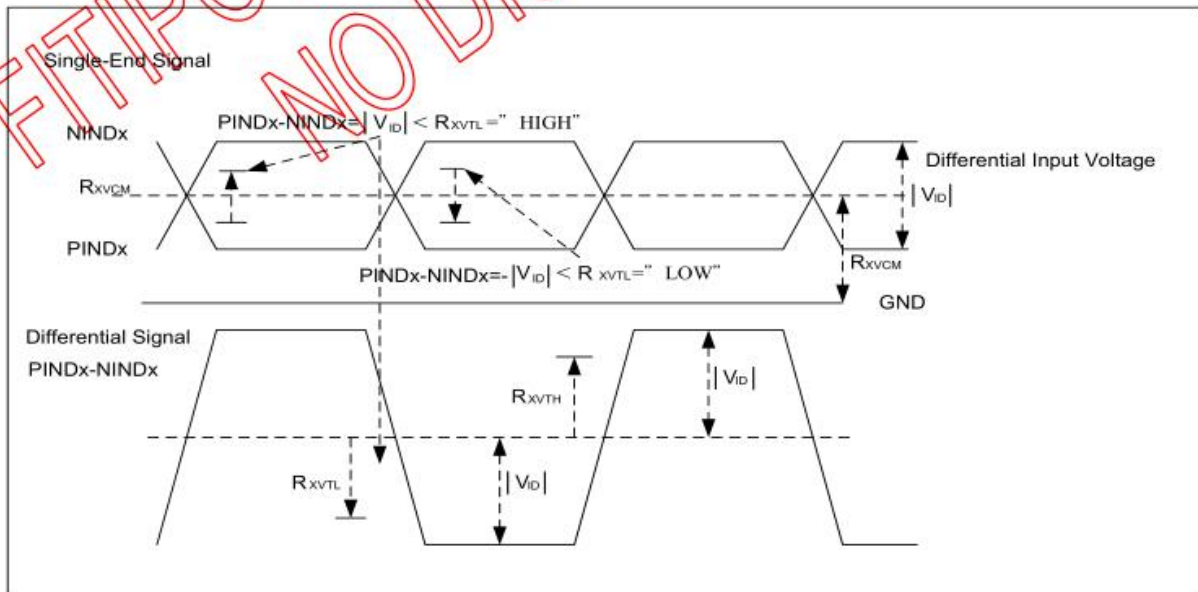
DE mode

DE mode

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60hz	fclk	40.8	51.2	67.2	Mhz
Horizontal display area	thd	1024			DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd	600			H
VSYNC period time	tv	610	635	800	H
VSYNC blanking	tvb+tvfp	10	35	200	H

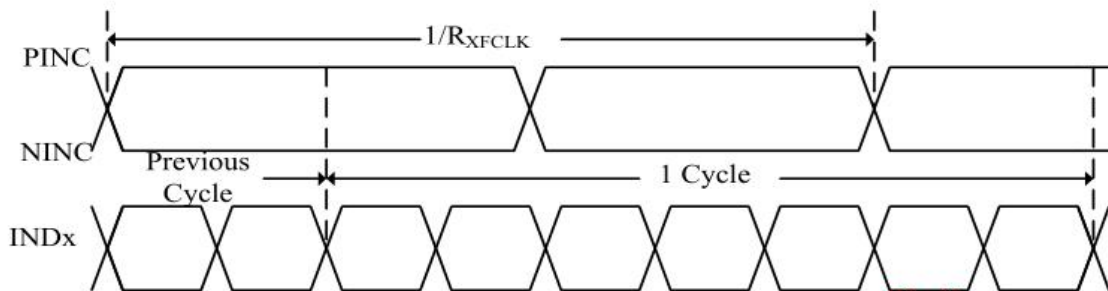
6-3 DC Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Differential input high threshold voltage	R_{xVTH}			+0.1V	V	$R_{xVCM}=1.2V$
Differential input low threshold voltage	R_{xVTL}	-0.1			V	
Input voltage range(single-end)	R_{xVIN}	0		2.4	V	
Differential input common mode voltage	R_{xVCM}	$ V_{ID} /2$		$2.4 - V_{ID} /2$	V	
Differential input voltage	$ V_{ID} $	0.2		0.6	V	
Differential input leakage current	R_{xVTH}	-10		+10	μA	
LVDS Digital Operating Current	I_{ddlvsd}	-	40(TBD)	50	mA	Fclk=65Mhz, VDD=3.3V
LVDS Digital Standby Current	I_{stlvsd}	-	10(TBD)	50	μA	Clock & all functions are stop

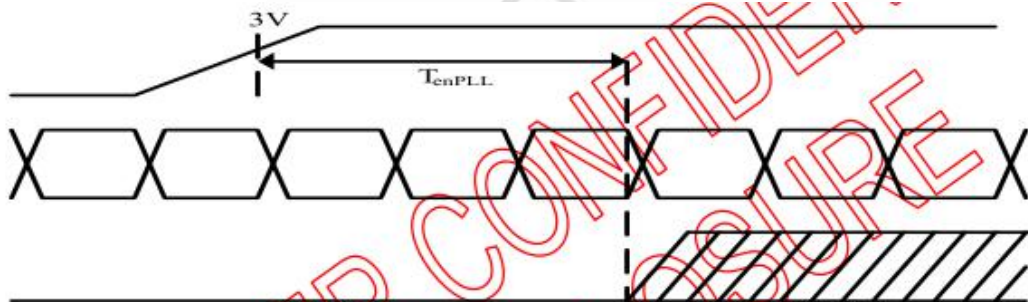


6-3 AC Electrical Characteristics

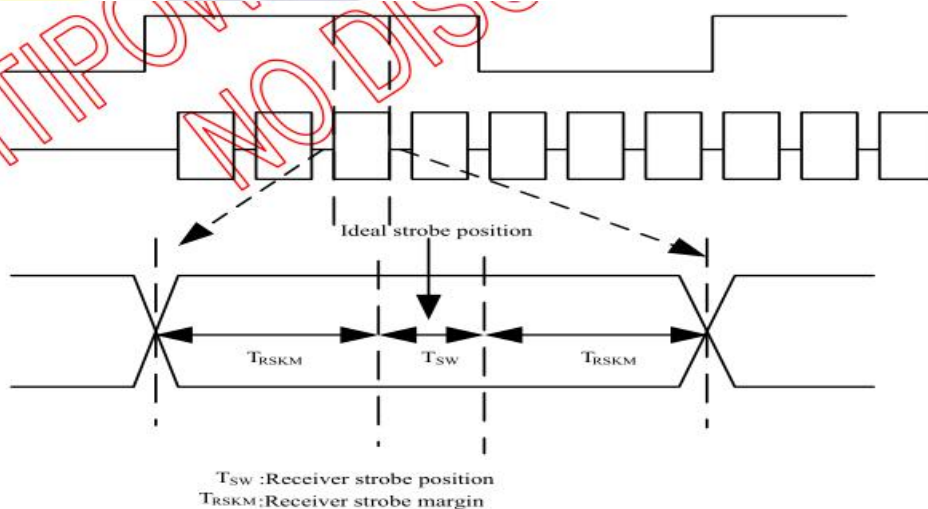
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Clock Frequency	RxFCLK		20	-	71	MHz
Input data skew margin	TRSKM	V _{id} =400mV R _{vcm} =1.2V RxFCLK=71MHz	500			ps
Clock High Time	TLVCH			4/(7* RxFCLK)		ns
						ns
Clock Low Time	TLVCL			3/(7* RxFCLK)		ns
PLL wake-up-time	T _{enPLL}				150	us



LVDS timing(1)



LVDS timing(2)



LVDS timing(3)

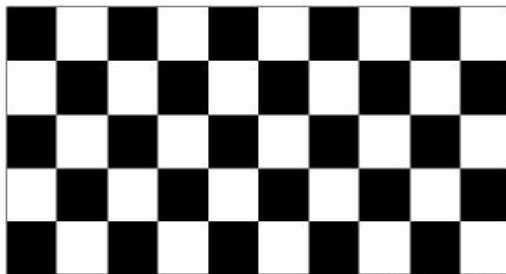
7. RELIABILITY TEST

7-1 Temperature and Humidity

TEST ITEMS	CONDITIONS	Remark
High Temperature Storage	Ta=+80 o C, 240hrs	
Low Temperature Storage	Ta=-30 o C, 240hrs	
High Temperature Operation	Ta=+70 o C, 240hrs	
Low Temperature Operation	Ta=-20 o C, 240hrs	
High Temperature and High Humidity (Operating)	Ta=+60 o C, 90%RH, 240hrs	

Note: (1) All tests above are practiced at module type.

(2) There is no display function NG issue occurred, all the cosmetic specification is judged before the reliability stress.



(a) Test Pattern (chess board Pattern)



(b) Gray Pattern

7-2 Shock and Vibration

ITEMS	CONDITIONS
Packing Shock (Non-Operation)	<ul style="list-style-type: none"> ● Shock level:980m/s² ● Waveform:1/2 Sine wave,6msec ● ±X, ±Y ±Z,each axis 1 times
Packing Vibration (Non-Operation)	<ul style="list-style-type: none"> ● Frequency range:8-33.3HZ ● Stoke:1.0mm ● Sweep: 10Hz-50Hz ● x,y,z 2 hours for each direction

7-3 Electrostatic Discharge

TEST ITEM	CONDITIONS
ESD (Non-operation)	150pF,330 Ω , Contact±4KV,Air :±8KV.Note 1
	200pF,0 Ω , ±200V Contact test.Note 2

Note:Measure Point:

- 1.LCD glass and metal bezel
- 2.IF connector pins

8.HANDDLING & CAUTIONS

8-1 Caution For Operation

◆Since the LCM is made of glass, do not apply strong mechanical impact or static load onto it. Handling with care since shock, vibration, and careless handling may seriously affect the product. If it falls from a high place or receives a strong shock, the glass maybe broken.

◆It is indispensable to drive the LCM within the specified voltage limit since the higher voltage than the limit causes LCM's life shorter. An electro-chemical reaction due to DC causes undesirable deterioration of the LCM so that the use of DC drive should avoid.

◆Do not connect or disconnect the LCM to or from the system when power is on.

◆Never use the LCM under abnormal conditions of high temperature and high humidity.

◆When expose to drastic fluctuation of temperature(hot to cold or cold to hot), the LCM may be affected; specifically, drastic temperature fluctuation from cold to hot, produces dew on the LCM's surface which may affect the operation of the polarizer on the LCM.

◆Response time will be extremely delay at lower temperature than the operating temperature range and on the other hand LCM may turn black at temperature above its operational range. However those phenomenon do not mean malfunction or out of order with the LCM. The LCM will revert to normal operation once the temperature returns to the recommended temperature range for normal operation.

◆Do not display the fixed pattern for a long time when using a normally black panel, as it may cause image sticking due to the LCM structure. If the screen is displayed in fixed mode, use a screen saver. It is recommended to display the fixed mode in less than 2 minutes or less.

◆Do not disassemble and/or re-assemble LCM module

8-2 Caution Against Static Charge

◆The LCM use C-MOS LSI drivers, so customers are recommended that any unused input terminal would be connected to Vdd or Vss, do not input any signals before power is turn on, and ground you body, work/assembly area, assembly equipments to protect against static electricity.

◆Remove the protective film slowly, keeping the removing direction approximate 30-degree not vertical from panel surface, if possible, under ESD control device like ion blower, and the humidity of working room should be kept over 50%RH to reduce the risk of static charge.

◆Avoid the use work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity-treated fibers.

◆In handling the LCM, wear non-charged material gloves. And the conducting wrist to the earth and the conducting shoes to the earth are necessary

9.LCD display initialization code

This product does not require initialization code driver

-END-