SPECIFICATION

FOR

TFT LCD MODULE

CUSTOMER ： _____

CUSTOMER MODULE: _____

SVT MODEL ： **SV0518-070028027AA**

☐**Preliminary Specification**

☑**Final Specification**

Customer Confirmation column（客户确认信息栏）：		
Approved by（核准）	**Dept. （部门）**	**Data （日期）**
SVT（世甲）：		
Designed by（制定）	**Checked by（审核）**	**Approved by（核准）**

Revision History（修订履历）

Version NO.（版本编号）	DATE（日期）	Description（描述）	Remak
A0	2023.03.27	FIRST ISSUE	

CONTENTS

1.0 General description

1.1 Introduction

SV0518-070028027AA is a color active matrix **TFT_ LCD** single cell using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This panel has a 7.0 inch diagonally measured active area with WSVGA resolutions (1024 horizontal by 600 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this module can display 16.7M colors.

1.2 Features

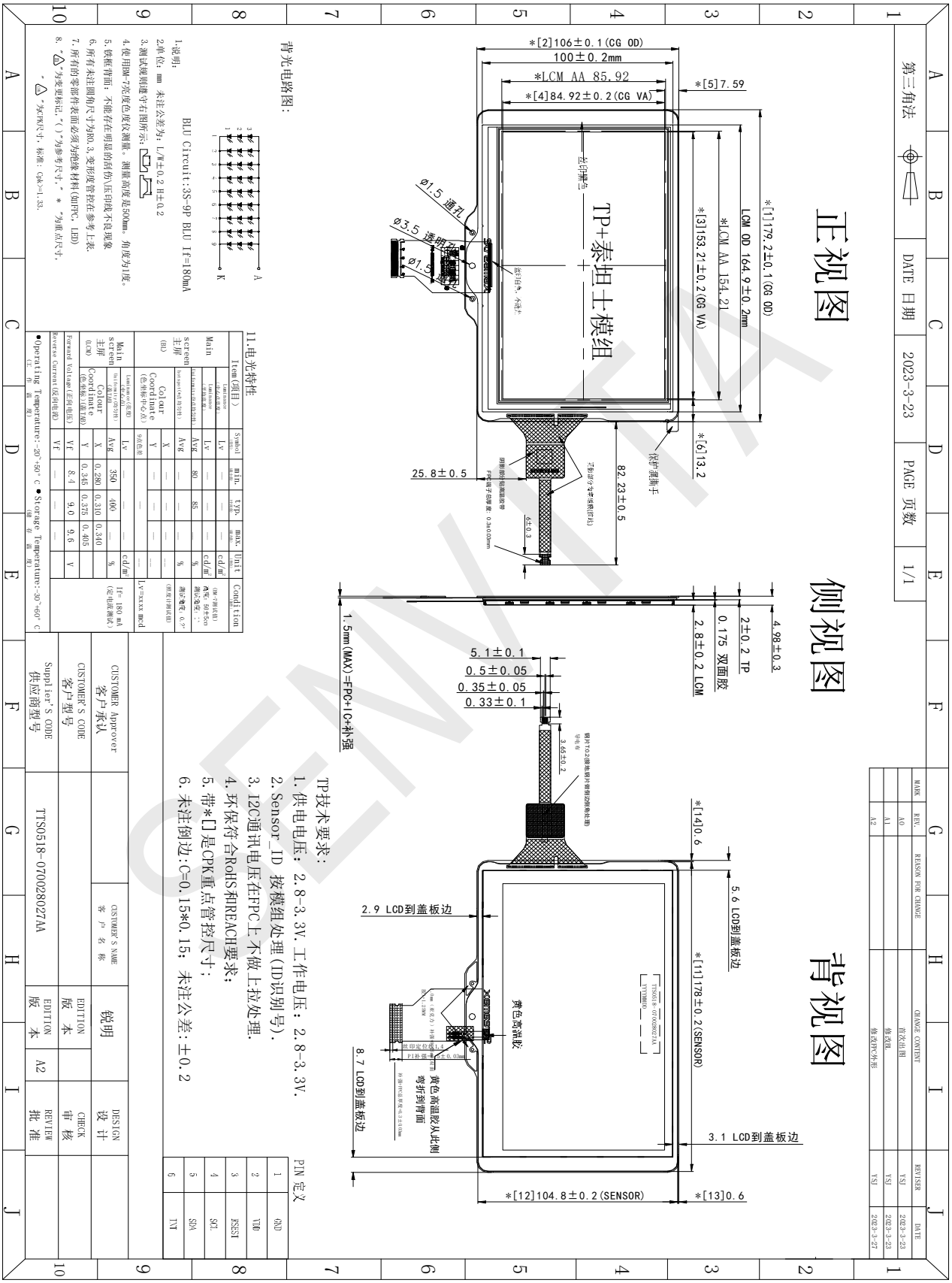
- **LVDS Interface**
- **8 bit resolution 256 gray scales**
- **It also supports dithering feature**
- **Low driving voltage and low power consumption**

ROHS Compliant

1.3 General information

Item	Specification	Unit	Remarks
Screen Size	7.0	inch	
Outline Dimension	179.2(H) x 106(V) x 4.98(body)	mm	Tolerance:±0.3mm
Display area	153.21 (H) × 84.92 (V)	mm	
Number of Pixel	1024(H) x RGB x 600(V)	pixels	
Pixel pitch	0.0502(H) x 0.1432(V)	mm	
Pixel arrangement	RGB Vertical stripe	/	
Display mode	Normally Wihte	/	
Interface	LVDS	/	
Driver IC	EK79001H+EK73215	/	*Using IC
Assy Type	CTP+TFT PANEL + FPC + BL	/	
BACKLIGHT	WHITE LED Backlight	/	
Luminous Intensity for LCM	350(min)/400(typ)	cd/m²	
Weight	TBD	gram	

2. DIAGRAM FOR LCM(结构示意图纸)



3. INTERFACE DESCRIPTION(接口定义描述)

3.1 INTERFACE DESCRIPTION

1	VCOM	Common Voltage
2	VDD	Power Voltage for digital circuit
3	VDD	Power Voltage for digital circuit
4	NC	No connection
5	Reset	Global reset pin
6	STBYB	Standby mode,normally pull high
		STBYB=”1”,normal operation
		STBYB=”0”,timing control,source driver will turn off,all output are high-Z
7	GND	Ground
8	RXIN0-	-LVDS differential data input
9	RXIN0+	+LVDS differential data inputt
10	GND	Ground
11	RXIN1-	-LVDS differential data input
12	RXIN1+	+LVDS differential data inputt
13	GND	Ground
14	RXIN2-	-LVDS differential data input
15	RXIN2+	+LVDS differential data inputt
16	GND	Ground
17	RXCLKIN-	-LVDS differential data input
18	RXCLKIN+	+LVDS differential data inputt
19	GND	Ground
20	RXIN3-	-LVDS differential data input
21	RXIN3+	+LVDS differential data inputt
22	GND	Ground
23	NC	No connection
24	NC	No connection
25	GND	Ground
26	NC	No connection
27	DIMO	CABC PWM Output.No connection
28	SELB	6bit/8bit mode selec SELB=”L”:8 bit SELB=”H”:6 bit
29	AVDD	Power for Analog Circuit
30	GND	Ground
31	LED-	LED Cathode
32	LED-	LED Cathode
33	SHLR	Source Right or Left sequence control.
34	UPDN	Gate Up or Down scan control.
35	VGL	Gate OFF Voltage
36	CABCEN1	No connection

37	CABCEN0	No connection
38	VGH	Gate ON Voltage
39	LED+	LED Anode
40	LED+	LED Anode

4. ABSOLUTE MAXIMUM RATINGS(极限参数)

Item	Symbol	Min	TYP	Max	Unit	NOTE
Operating temperature	Top	-20	-	70	℃	At 25±5℃
Storage temperature	Tst	-30	-	80	℃	
Humidity	RH	-	90%(Max60℃)	-	RH	
Power Voltage	VDD	0.3	-	3.6	V	

Note1: If users use the product out off the environmemtal operation range (temperature and humidity,it will have visual quality concerns.

注 1：如果用户使用的产品超出了环境操作范围（温度和湿度），则将存在视觉质量问题。

5. ELECTRICAL CHARACTERISTICS(模块电气特性)

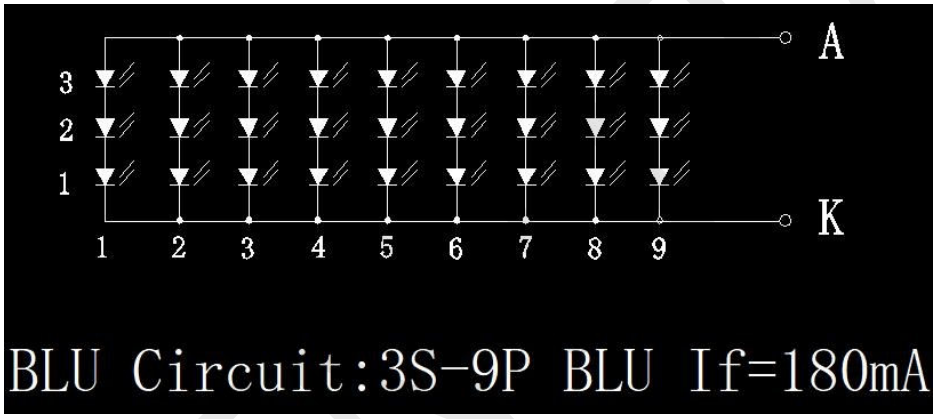
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	VDD	2.8	**3.3**	3.6	V	
	AVDD	8	**9.6**	13.5	V	Note (1)
	VGH	16	**18**	20	V	
	VGL	-5	**-6**	-7	V	
	VCOM	3.0	**3.3**	4.2	V	Note (2)

Note (1):调整对比度， 调大颜色变深，调小颜色变浅

Note (2):Please adjust VCOM to make the flicker level minimum.**Typ VCOM 电压值只做参考, 具体以实际效果为准**

6. BACKLIGHT SPECIFICATION(背光电气特性)

Item of backlight characteristics	Symbol	Min	TYP	Max	Unit	NOTE
Forward Voltage	Vf	8.4	-	9.6	V	
	If	-	180	-	MA	
BL Luminance	LV	-	TBD	-	cd/m2	
Backlight uniformity	-	-	80%	-	No less than 80% 均匀性	
Number of LED	-	（3 串 9 并）27			Pcs	

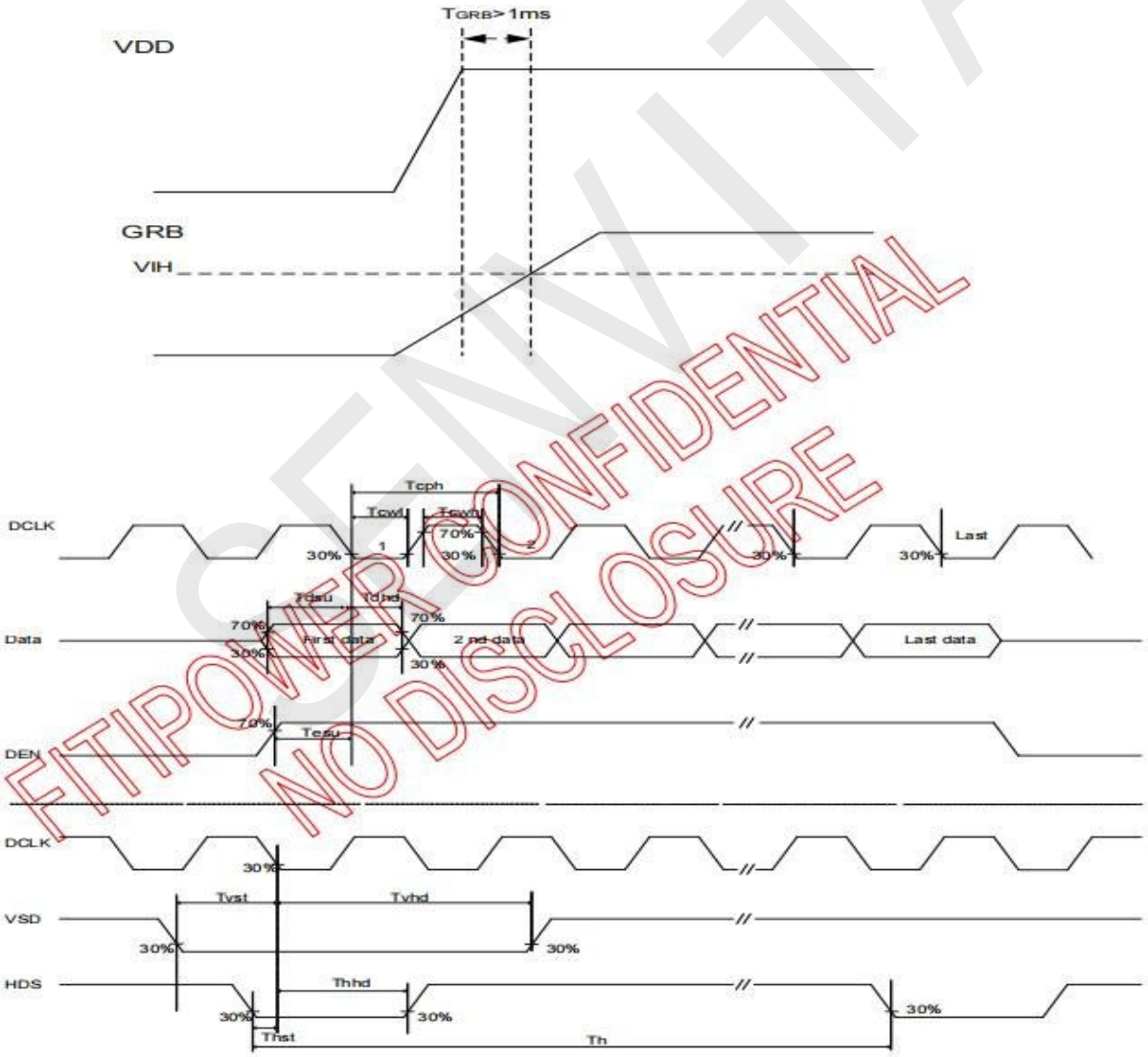


7.TIMING CHARACTERIST(时序特征)

7.1 LVDS mode AC electrical Characteristics

LVDS mode

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Clock Frequency	RxFCLK		20	-	71	MHz
Input data skew margin	TRSKM	|VID|=400mV RxVCM=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	TenPLL				150	us

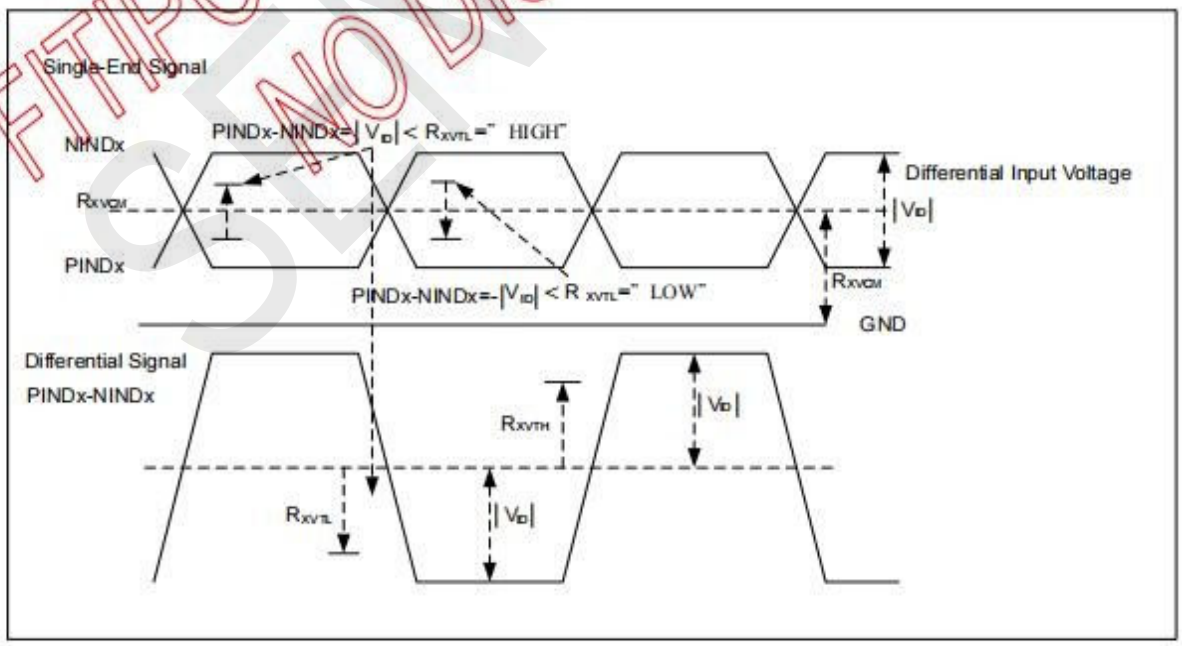


Parallel Input Clock and Data timing

7.2 LVDS mode DC electrical Characteristics

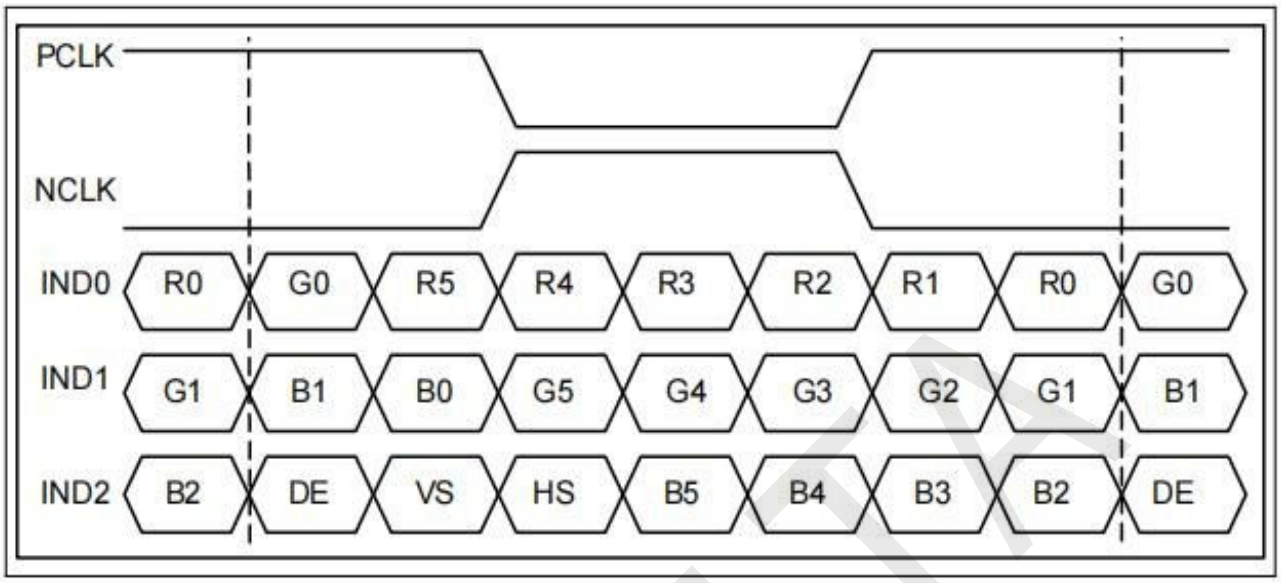
LVDS DC characteristic

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Differential input high threshold voltage	RxVTH			+0.1V	V	RxVCM=1.2V
Differential input low threshold voltage	RxVTL	-0.1			V	
Input voltage range(single-end)	RxVIN	0		2.4	V	
Differential input common mode voltage	RxVCM	$\|V_{ID}\|/2$		2.4 -$\|V_{ID}\|/2$	V	
Differential input voltage	$\|V_{ID}\|$	0.2		0.6	V	
Differential input leakage current	RxVTH	-10		+10	V	
LVDS Digital Operating Current	Iddlvsd	-	40(TBD)	50	mA	Fclk=65Mhz, VDD=3.3V
LVDS Digital Standby Current	Istlvds	-	10(TBD)	50	uA	Clock & all functions are stop



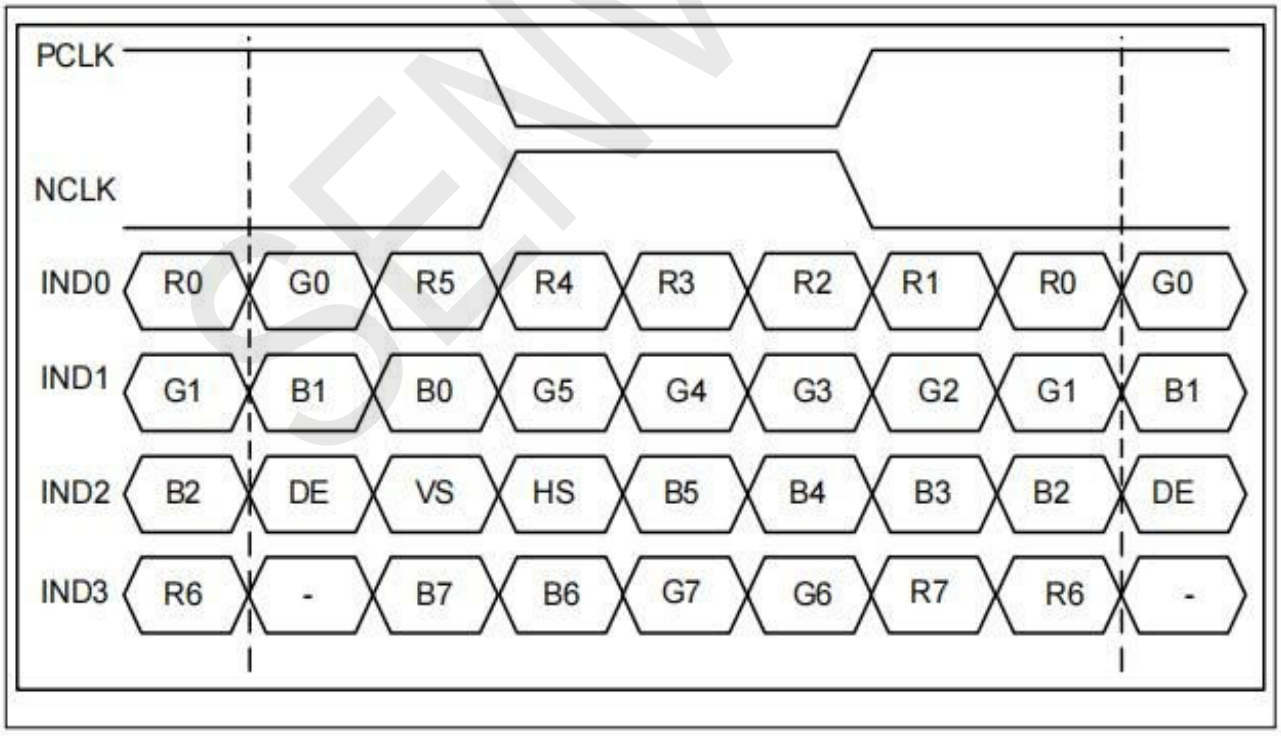
7.3 LVDS mode date input format

6-bit LVDS input(SELB="H")



6-bit LVDS Input Timing chart

8-bit LVDS input (SELB="L")



8-bit LVDS Input Timing chart

7.4 Paraller RGB input timing table

Resolution：1024x600

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

HV mode(1)

HV mode
Horizontal input timing

Parameter		Symbol	Value			Unit
Horizontal display area		thd	1024			DCLK
DCLK frequency@ Frame rate=60hz		fclk	Min.	Typ.	Max.	
			44.9	51.2	63	Mhz
1 Horizontal Line		th	1200	1344	1400	DCLK
HSYNC pulse width	Min.	thpw	1			
	Typ.		–			
	Max.		140			
HSYNC back porch		thbp	160	160	160	
HSYNC front porch		thfp	16	160	216	

HV mode(2)

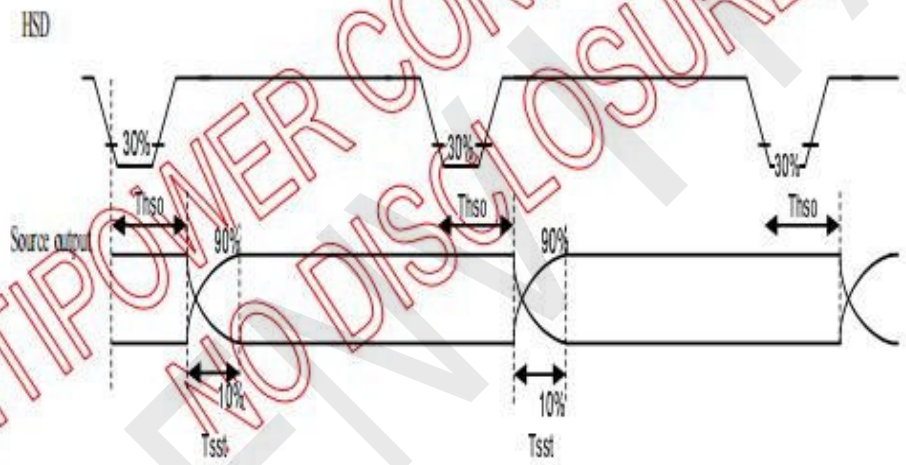
Vertical input timing

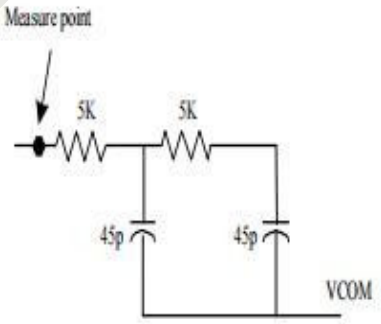
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd		600		H
VSYNC period time	tv	624	635	750	H
VSYNC pulse width	tvpw	1	–	20	H
VSYNC back porch	tvb	23	23	23	H
VSYNC front porch	tvfp	1	12	127	H

7.5 Timing

Output Timing Table

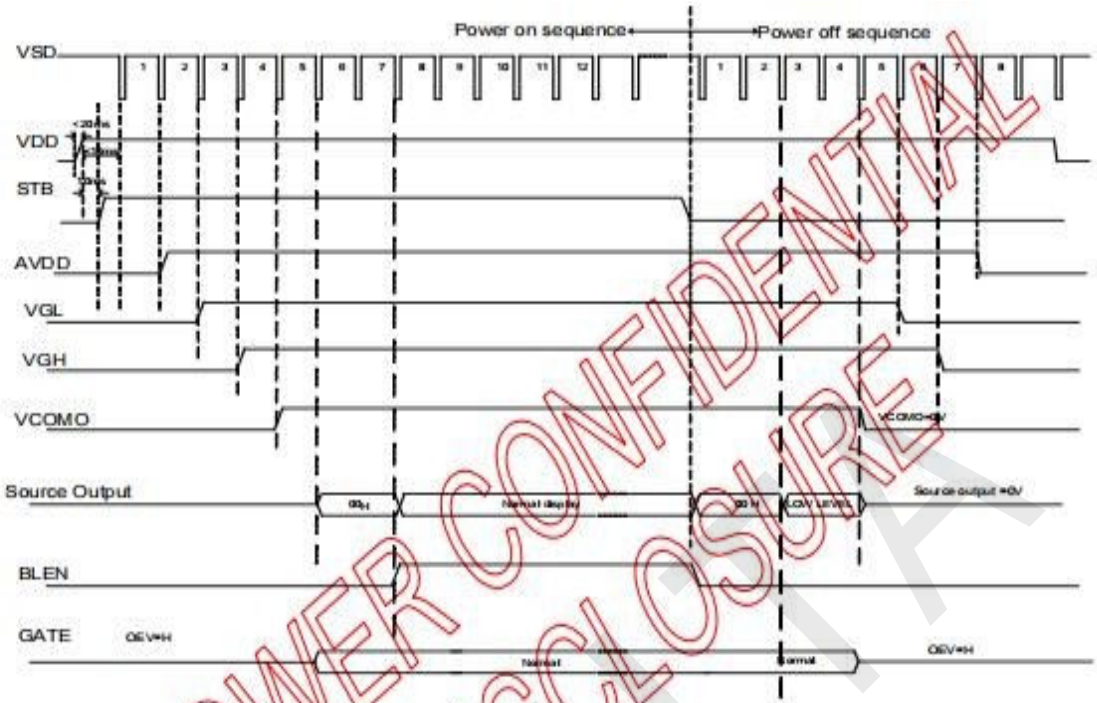
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
DCLK frequency	Fclk	-	65	71	MHz	VDD =2.3~3.6V
DCLK cycle time	Tclk	14.1	15.4		ns	
DCLK pulse duty	Tcwh	40	50	60	%	Tclk
Time from HSD to Source Output	Thso	-	64	-	DCLK	
Time from HSD to LD	Thld	-	64	-	DCLK	
Time from HSD to STV	Thstv	-	2	-	DCLK	
Time from HSD to CKV	Thckv	-	20	-	DCLK	
Time from HSD to OEV	Thoev	-	4	-	DCLK	
LD pulse width	Twld	-	10	-	DCLK	
CKV pulse width	Twckv	-	66	-	DCLK	
OEV pulse width	Twoev	-	74	-	DCLK	



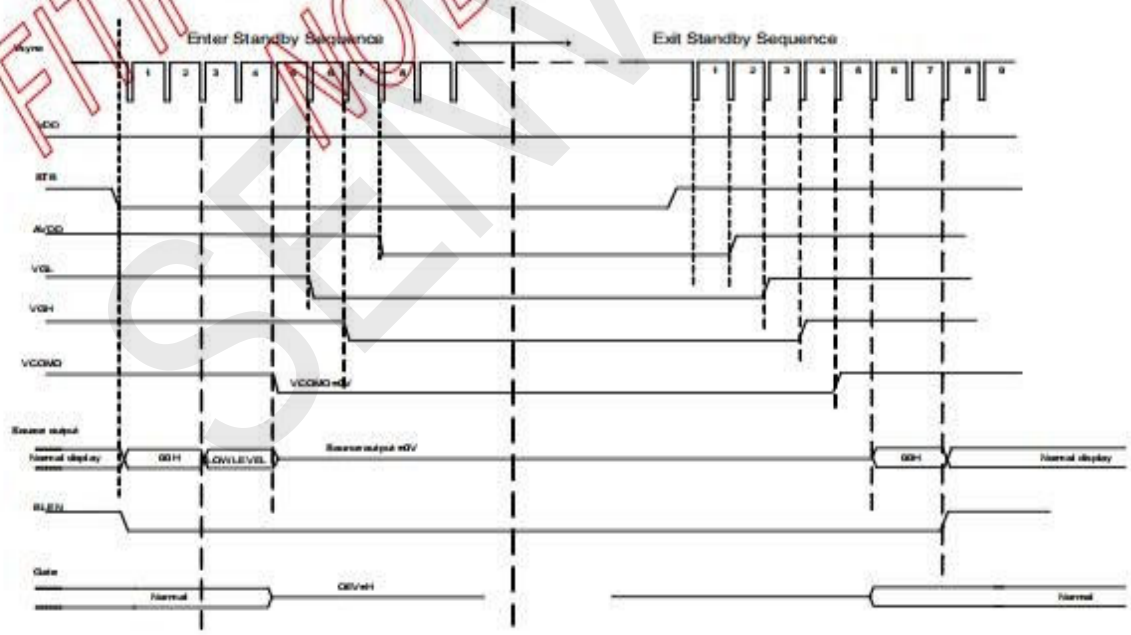


Source Output Timing

7.6 Power ON/OFF Sequence



Power On/Off timing chart



Enter and Exit Standby Mode timing chart

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

8.ELECTRO-OPTICAL CHARACTERISTICS (光电参数)

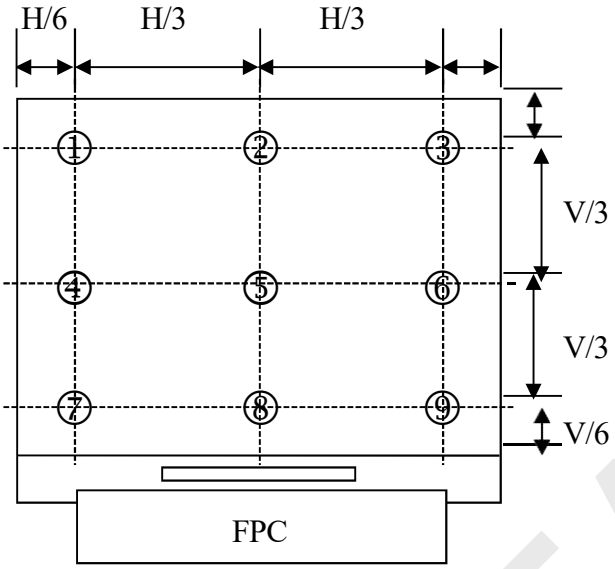
Optical Specifications

Item	Symbol	Temp	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle range	Horizontal	θ_L	CR > 10	-	80	--	Deg	Note (4)
		θ_R		-	80			
	Vertical	θ_U		-	60	--	Deg	
		θ_D		-	70			
Luminance Contrast ratio		CR	θ= 0°	500	600	--	--	Note (1)
Brightness		YL		350	400	--	Cd/cm2	Note (2)
Transmittance		T(%)	θ= 0°	3.9	4.2	--	%	
Color Gamut (C light)				45	50	--	%	
Reproduction of color （C-light）	White	Xw	θ=0°	-0.03	0.310	+0.03		Note (5)
		Yw			0.375			
	Red	Rx			0.615			
		Ry			0.320			
	Green	Gx			0.296			
		Gy			0.569			
	Blue	Bx			0.142			
		By			0.174			
Response Time (Rising + Falling)	Trt		Ta= 25°C θ= 0°	--	25	40	ms	Note (3)

Note1 Definition of Contrast Ratio (CR):

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note2: Definition of Luminance Uniformity: Active area is divided into 9 measuring areas (Shown in below), every measuring point is placed at the center of each measuring area.



The spot locations for luminance measurement

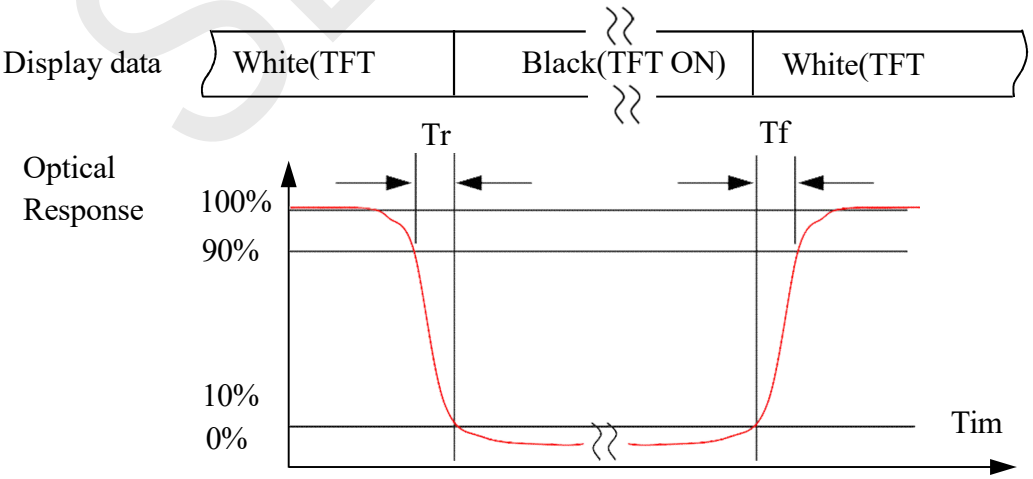
$$\text{Luminance Uniformity} = \frac{H/6 \quad B_{min}}{V/6} \times 100\%$$

B_{max}:

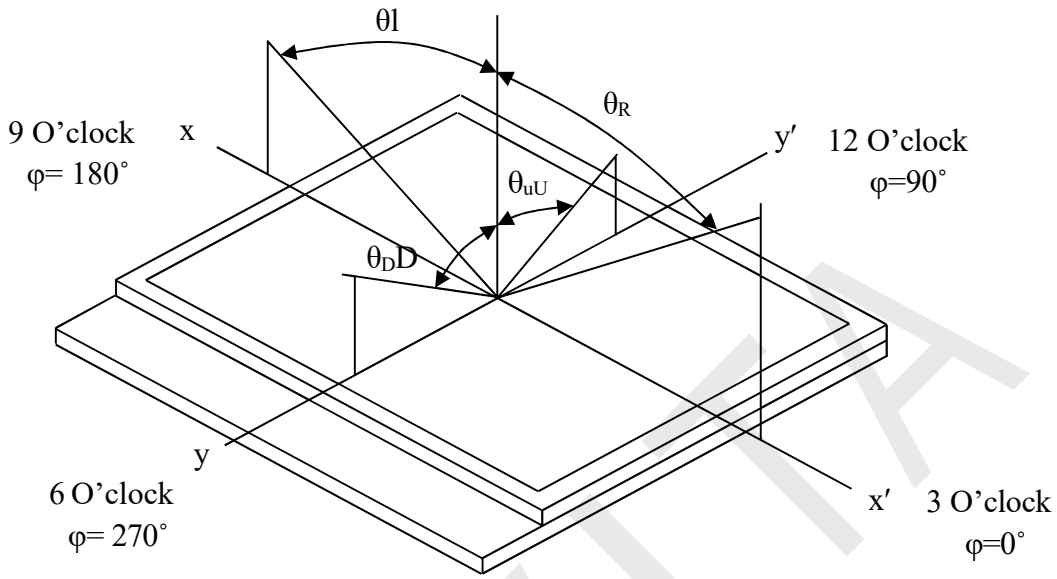
B_{max}: The measured maximum luminance of all measurement position.

B_{min}: The measured minimum luminance of all measurement position.

Note 3:Definition of Response time: Sum of Tr and Tf



Note4.Definition of Viewing Angle: The viewing angle range that the CR≥10



Note 5: Definition of Color Chromaticity (CIE1931)
Color coordinate of white & red, green, blue at center point.

9. RELIABILITY TEST CONDITIONS(可靠性实验条件)

No	Test Item	Test Condition	STANDARD
1	High Temperature Storage	+80°C / 96Hours	1. Functional test is OK. Missing Segment, short, unclear segment, on-display, display abnormally and liquid crystal leak are un-allowed. 2. No low temperature bubbles, end seal loose and fall, frame rainbow.
2	Low Temperature Storage	-30°C / 96Hours	
3	High Temperature Operating	+70°C / 96Hours	
4	Low Temperature Operating	-20°C / 96Hours	
5	Thermal and cold shock	-20°C⇆+70°C x 10cycles (30min) (5min) (30min)	
6	Operate at High Temperature and Humidity	60°C x 90%RH / 24H	
7	Vibration Test	Frequency: 10Hz~55Hz~10Hz Amplitude:1.5mm, 2 hours for each direction of X, Y, Z	1. Function test is OK. 2. No glass crack, chipped glass, end seal loose and fall, epoxy frame crack and so on. 3. No structure loose and fall.
8	Dropping test	Drop to the ground from 1m height, 1 corner, 3 edges, 6 surfaces.	
9	ESD test	Contact: ±6KV Air: ±8KV 150PF/330Ω,5Points/panel,5times	The test results shall be subject to the whole machine test.

NOTE:

1. The reliability items will be fully performed in new sample qualification,
2 .The reliability status will be tested as monitor during mass production. Individual reliability test shall be performed by lot , Moreover, the individual reliability item shall be decided according to reliability plan.
3. All samples are inspected after keeping in the room with normal temperature and humidity for 2 hours or above.
4. Vibration test: It is not necessary to test for those products without assembly frame , backlight , PCB and so on.
5. Dropping test : It is necessary for affirming new package.
6. For the high temperature and high humidity test, pure water of over 10 MΩ.cm should be used.
7. Each test item applies for test LCM only once .Then tested LCM cannot be used again in any other test item.
8. The quantity of LCM examination for each test item is 5pcs to 10pcs.