

广东高展光电股份有限公司
GUANGDONG SUPERVIEW OPTOELECTRONICS CO.,LTD.

样品承认书
APPROVAL SHEET

PRODUCT MODEL	G667AAA285A0(GD3504B)		
REMARKS	TFT MODULE, 480(RGB) * 1280 PIXELS		
APPROVED	PREPARED BY	CHECKED BY	APPROVED BY
SIGNATURE BY SUPERVIEW			

APPROVED SIGNATURE BY CUSTOMER:

PROJECT	QUALITY	APPROVED

[illegible]

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1. GENERAL SPECIFICATION

1.1 Description

The G667AAA285A0 is a color active matrix Thin Film Transistor (TFT) Liquid Crystal Display (LCD) that uses amorphous silicon(a-Si) TFT as a switching device, and with a Capacitive Touch Panel(CTP). This model is composed of a single 6.67 inches transmissive type main TFT-LCD panel. The resolution of the panel is 480RGBx1280 pixels and can display up to 16.7M color.

1.2 Feature

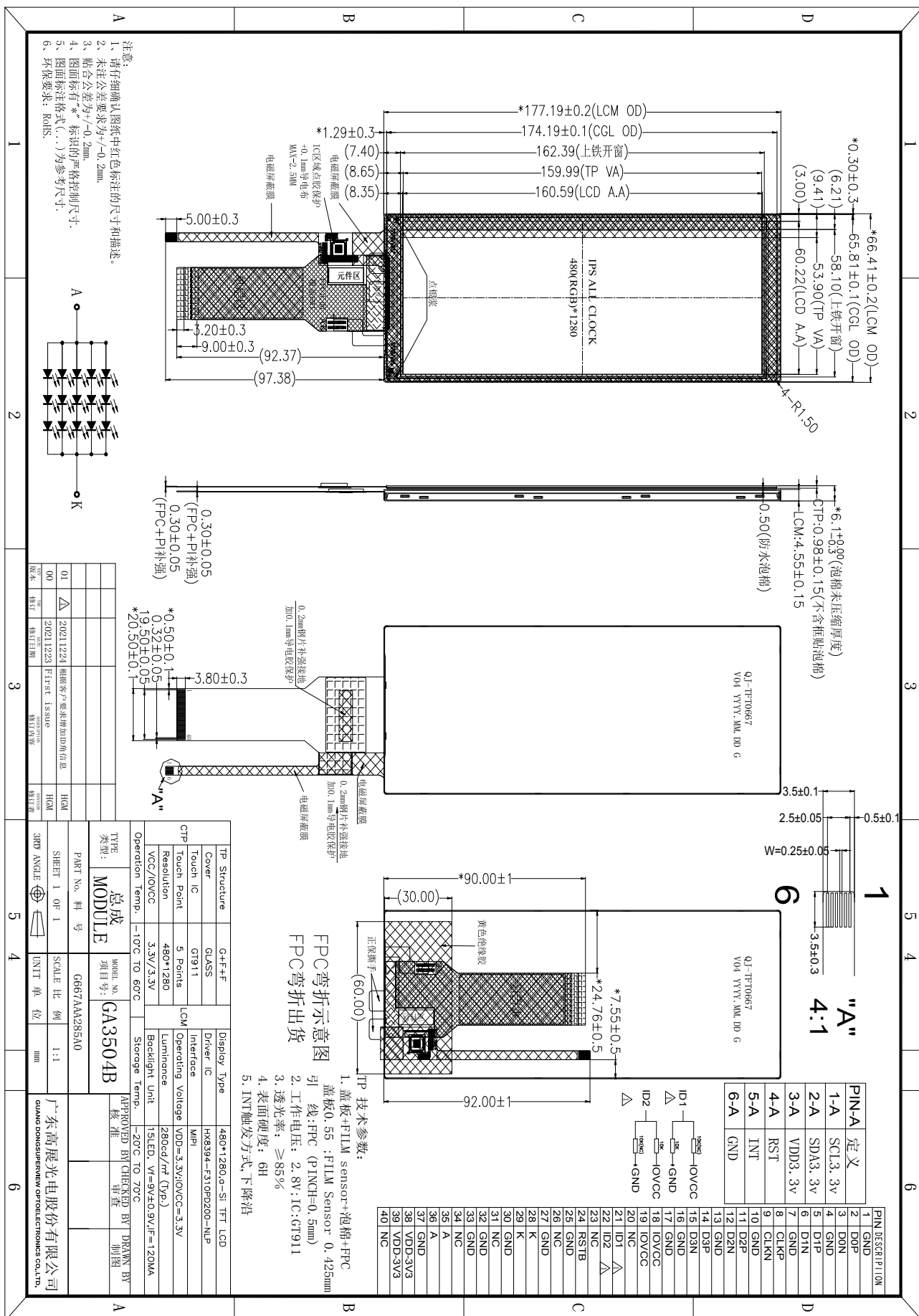
- IPS type for main TFT-LCD panel
- Structure COG+FPC+BL+CTP
- Full, Normal (Still), Partial, Sleep mode are available

1.3 General Specification

No.	Item	Specification	Unit	Remark
1	LCD Size	6.67	inch	-
2	Panel Type	a-Si TFT active matrix	-	-
3	Resolution	480 x (RGB) x 1280	pixel	-
4	Display Mode	Normally Black	-	-
5	Display Number of Colors	16.7M	-	-
6	Viewing Direction	ALL	-	Note
7	Contrast Ratio	1500(Typ.)	-	-
8	Luminance	280(Typ.)	cd/m ²	-
9	Module Size	66.41(W) x177.19(L) x 6.1(T)	mm	Note
10	Active Area	60.22*160.59	mm	Note
11	Driver IC	HX8394-F310PD200-NLP	-	-
12	Light Source	15 LEDs White	-	-
13	Interface	MIPI	-	-
14	Operating Temperature	-10~60	°C	-
15	Storage Temperature	-20~70	°C	-

Note: Please refer to the mechanical drawing.

2. MECHANICAL DRAWING

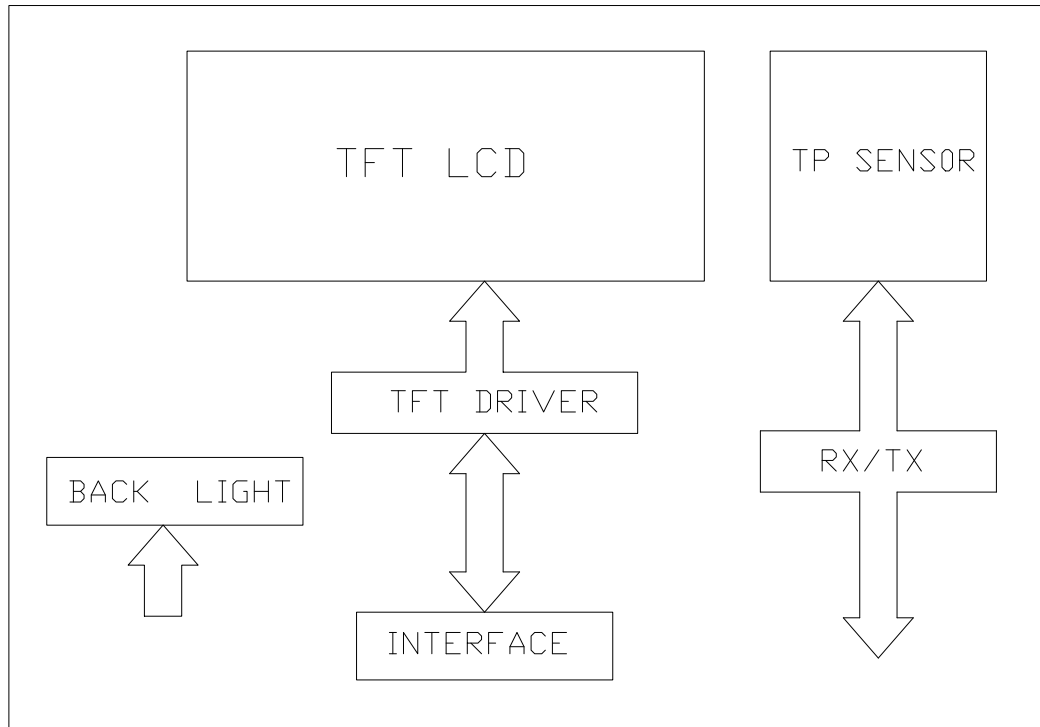


3. INTERFACE ASSIGNMENT

1	GND	Ground
2	D0P	MIPI DSI : Data differential signal input pins
3	D0N	MIPI DSI : Data differential signal input pins
4	GND	Ground
5	D1P	MIPI DSI : Data differential signal input pins
6	D1N	MIPI DSI : Data differential signal input pins
7	GND	Ground
8	CLKP	MIPI DSI : Data differential signal input pins
9	CLKN	MIPI DSI : Data differential signal input pins
10	GND	Ground
11	D2P	MIPI DSI : Data differential signal input pins
12	D2N	MIPI DSI : Data differential signal input pins
13	GND	Ground
14	D3P	MIPI DSI : Data differential signal input pins
15	D3N	MIPI DSI : Data differential signal input pins
16	GND	Ground
17	GND	Ground
18	IOVCC	POWER supply for system
19	IOVCC	POWER supply for system
20	NC	No connection
21	ID1	LCM Identify
22	ID2	LCM Identify
23	NC	No connection
24	RSTB	LCD RESET PIN, External reset, low is active
25	GND	Ground
26	NC	No connection
27	GND	Ground
28	K	Back light LEDK
29	K	Back light LEDK
30	GND	Ground
31	NC	No connection
32	GND	Ground
33	GND	Ground
34	NC	No connection
35	A	Back light LEDA
36	A	Back light LEDA
37	GND	Ground
38	VDD-3V3	Power supply for digital circuits 3.3V
39	VDD-3V3	Power supply for digital circuits 3.3V
40	NC	No connection

4. ELECTRICAL SPECIFICATION

4.1. Block Diagram



4.2. Tft Absolute Maximum Ratings

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			Min.	Typ.	Max.	
Power Supply for Analog	VDD	Ta=25 °C	-0.3	-	3.6	V
Power Supply for Digital IO	IOVCC	Ta=25 °C	-0.3	-	3.6	V

Note: Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is applied.

4.3. Tft Typical Operation Condition
4.3.1 TFT DC Characteristics

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			Min.	Typ.	Max.	
Power Supply for Analog	VDD	Ta=25 °C	-	3.3	-	V
Power Supply for Digital IO	IOVCC	Ta=25 °C	-	3.3	-	V
Input Signal "H" Level	V _{IH}	-	0.7IOVCC	-	IOVCC	V
Input Signal "L" Level	V _{IL}	-	0	-	0.3IOVCC	V
Output Signal "H" Level	V _{OH}	I _{OH} =-1.0mA	0.8IOVCC	-	IOVCC	V
Output Signal "L" Level	V _{OL}	I _{OL} =1.0mA	0	-	0.2IOVCC	V
Frame Frequency	FRAME	-	50	60	70	Hz

Note: To prevent IC latch up or DC operation in LCD panel, the power on/off sequence should follow the driver IC specification.

4.3.2 TFT Current Consumption

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
MIPI Interface						
Normal(Still) Mode	I _{CC1}	-	-	-	mA	Note1
Standby Mode	I _{CC1}		-	-	uA	Note2

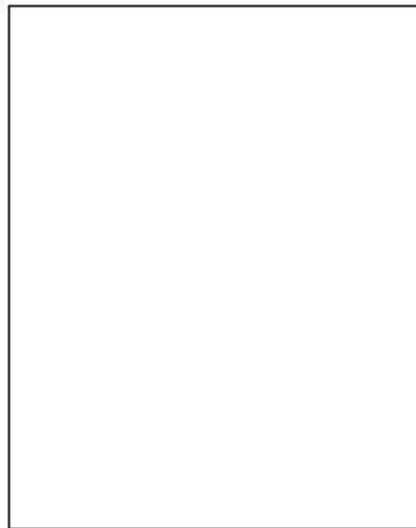
Note1: Test Condition

VDD=3.3V;IOVCC=3.3V

Display Pattern: All Pixel White

Frame Rate=60Hz at Column Inversion

Max. current check pattern:

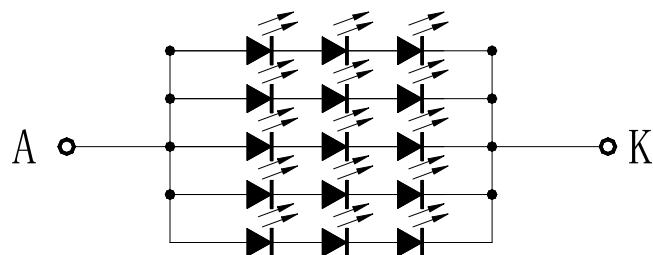


White

Note2: In the standby mode, all the internal display operations are suspended including the internal R-C oscillator.

4.4. Backlight Specification

4.4.1 Backlight Circuit



4.4.2 ELECTRICAL CHARACTERISTICS

(T=25℃)

PARAMETER	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			Min.	Typ.	Max.	
FORWARD VOLTAGE	VF	IF=120mA	8.1	9	9.9	V

4.5 Power on/off Timing:

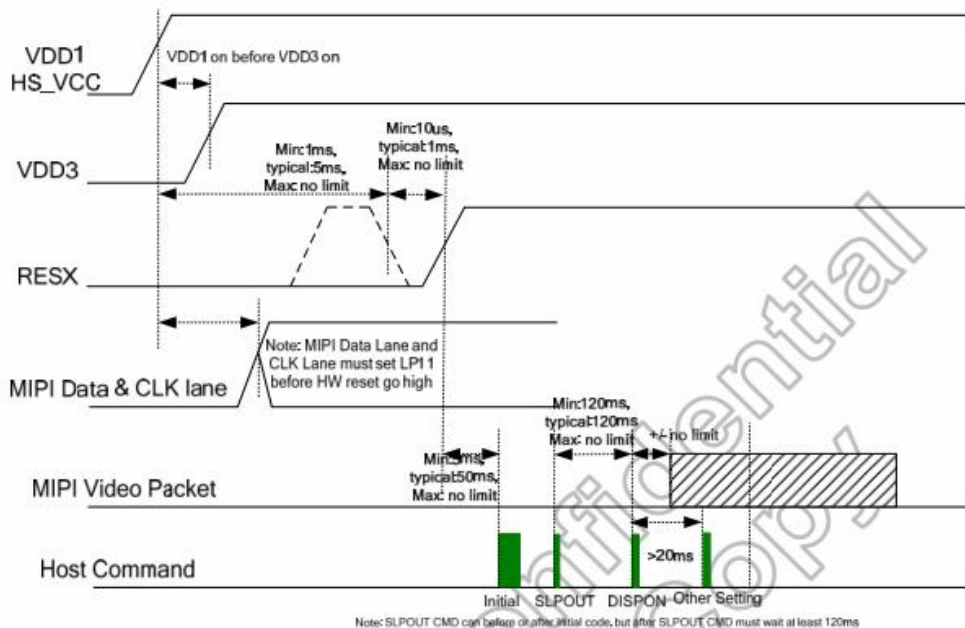


Figure 5.28: VDD1/VDD3 input power on sequence

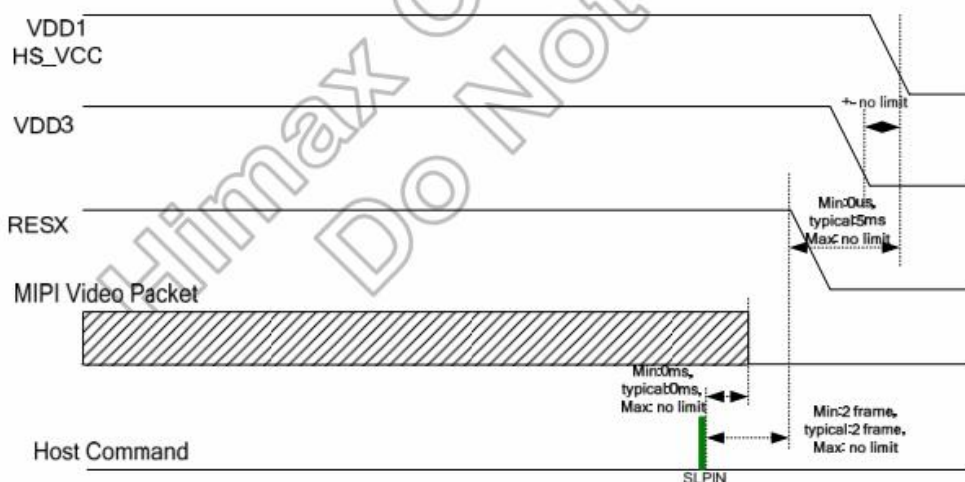


Figure 5.29: VDD1/VDD3 input power off sequence

4.6.Interface Characteristics:

High speed data transmission

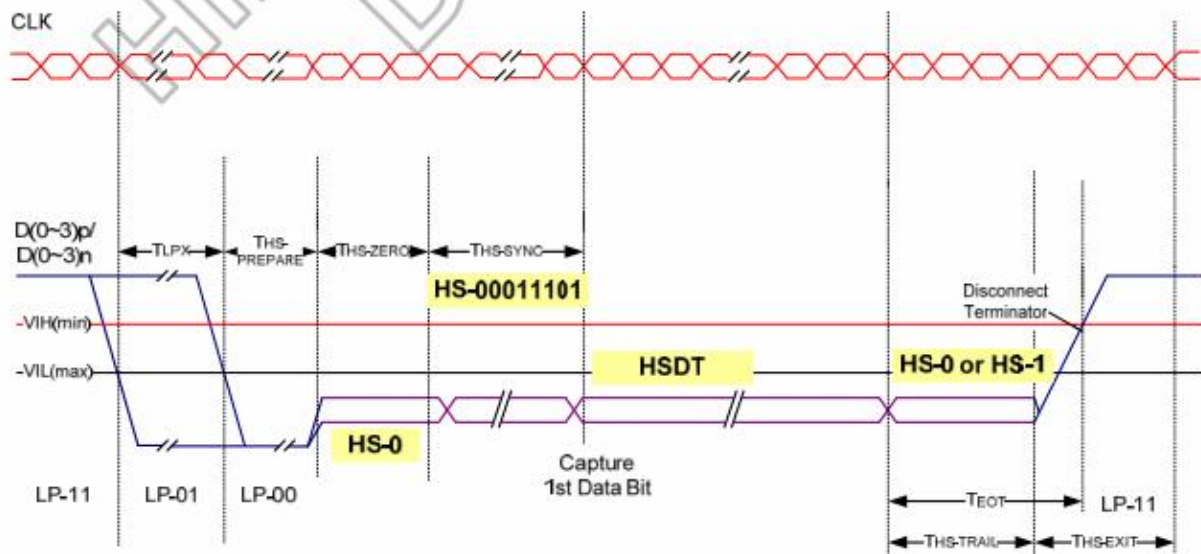


Figure 4.12: High speed data transmission timing sequence

Parameter	Description	Spec.			Unit
		Min.	Typ.	Max.	
$T_{HS-PREPARE}$	Time that the transmitter drives the Data Lane LP-00 Line state immediately before the HS-0 Line state starting the HS transmission.	$40+4*UI$	-	$85+6*UI$	ns
$T_{HS-PREPARE} + T_{HS-ZERO}$	THS-PREPARE + time that the transmitter drives the HS-0 state prior to transmitting the Sync sequence.	$145+10*UI$	-	-	ns
T_{EOT}	Transmitted time interval from the start of THS-TRAIL or TCLK-TRAIL, to the start of the LP-11 state following a HS burst.	-	-	$105ns+12*UI$	ns
$T_{HS-TRAIL}$	Time that the transmitter drives the flipped differential state after last payload data bit of a HS transmission burst.	$60ns+4*UI$	-	-	ns
$T_{HS-EXIT}$	Time that the transmitter drives LP-11 following a HS burst.	100	-	-	ns

Table 4.2: Global operation timing parameters for data lane

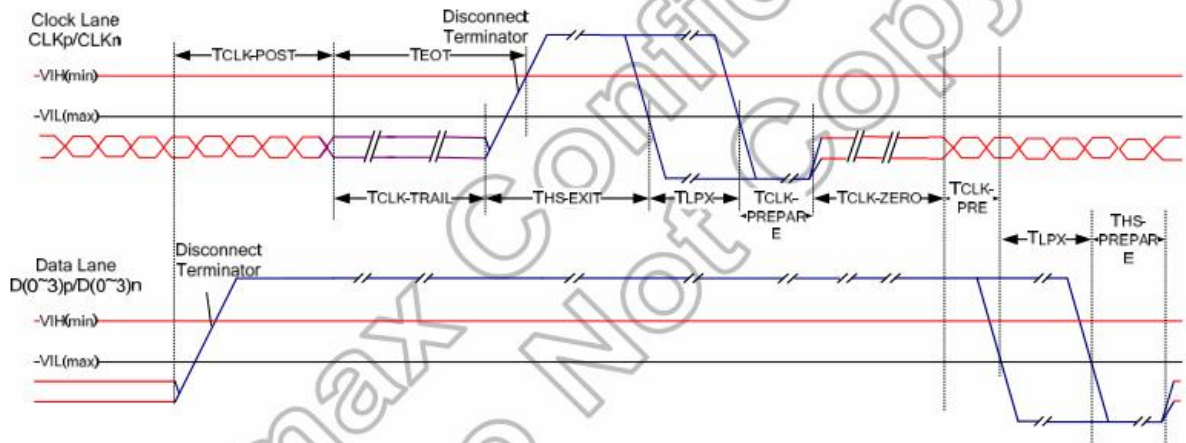


Figure 4.13: Switching the clock lane between clock transmission and LP mode

Parameter	Description	Spec.			Unit
		Min.	Typ.	Max.	
$T_{CLK-POST}$	Time that the transmitter continues to send HS clock after the last associated Data Lane has transitioned to LP Mode.	$60+52*UI$	-	-	ns
$T_{CLK-TRAIL}$	Time that the transmitter drives the flipped differential state after last payload data bit of a HS transmission burst.	60	-	-	ns
$T_{CLK-PREPARE}$	Time that the HS clock shall be driven by the transmitter prior to any associated Data Lane beginning the transition from LP to HS mode.	38	-	95	ns
$T_{CLK-PREPARE}+T_{CLK-ZERO}$	$T_{CLK-PREPARE}$ + time that the transmitter drives the HS-0 state prior to starting the Clock.	300	-	-	ns
$T_{CLK-PRE}$	Time that the HS clock shall be driven by the transmitter prior to any associated Data Lane beginning the transition from LP to HS mode.	$8*UI$	-	-	ns

Table 4.3: Global operation timing parameters for clock lane

5. TOUCH PANEL SPECIFICATION**5.1. General Specification**

No.	Item	Specification	Unit
1	Size	6.67	inch
2	Type	Capacitive Touch Panel	-
3	Touch Panel Structure	Glass Cover+Film Sensor	-
4	Touch Panel Surface Hardness	$\geq 6H$	-
5	Transmittance	≥ 85	%
6	Touch Panel Controller IC	GT911	-
7	Touch Panel Interface	I2C	-
8	Touch Point	5 points	-

5.2. FPC PIN Assignment

PIN NO.	SYMBOL	FUNCTION DESCRIPTIONS
1	SCL	I2C Serial clock input/output
2	SDA	I2C Serial data input/output
3	VDD	Positive power supply
4	RST	Reset signal
5	INT	External Interrupt
6	GND	Ground

5.3.DC Characteristics

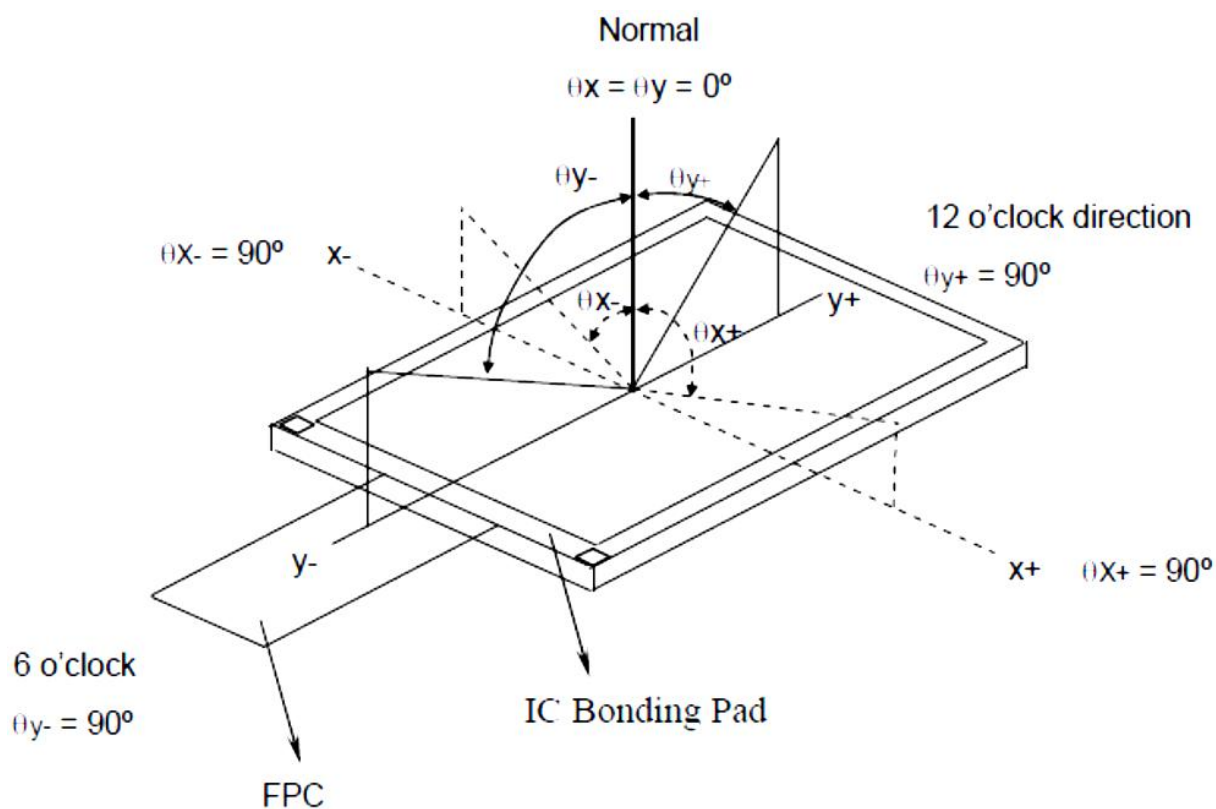
ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			Min.	Typ.	Max.	
Power Supply for Analog	VDD	Ta=25 °C	-	3.3	-	V
Power Supply for Digital IO	IOVDD	Ta=25 °C	-	3.3	-	V
Input Signal “H” Level	VIH	IOVDD=3.3V	0.75*IOVDD	-	IOVDD+0.3	V
Input Signal “L” Level	VIL		GND	-	0.25*IOVDD	V
Current Consumption (Sleep mode)	IDD1	-	39	-	135	uA
Current Consumption (Green mode)	IDD2	-	-	7	-	mA
Current Consumption (Normal mode)	IDD3	-	-	20	-	mA

6. LCD OPTICAL CHARACTERISTICS

($T_a=+25^{\circ}\text{C}$, $V_{CI}=+2.85\text{V}$ $IOVCC=+1.8\text{V}$, $I_B=20\text{mA}$)

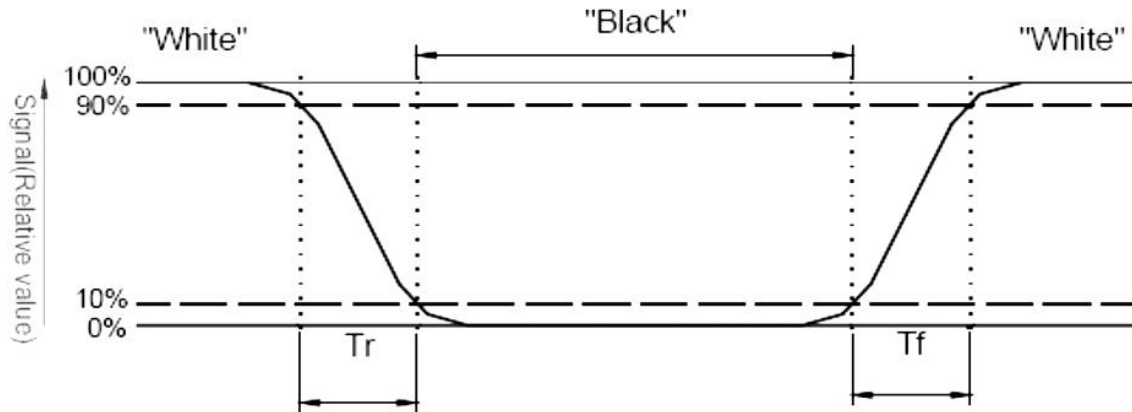
Item		Symbol	Condition	Values			Unit	Remark
				Min.	Typ.	Max.		
Viewing Angle Range	Left	θ_L	$CR \geq 10$	70	80	-	degree	Note 1
	Right	θ_R		70	80	-		
	Top	Φ_T		70	80	-		
	Bottom	Φ_B		70	80	-		
Response Time		$T_{on} + T_{off}$	Normal $\theta = \Phi = 0^{\circ}$	-	25	35	ms	Note 2
Contrast Ratio		CR	Normal $\theta = \Phi = 0^{\circ}$	1000	1500	-	-	Note 3
Luminance		L	Normal $\theta = \Phi = 0^{\circ}$	230	280	-	cd/m^2	Note 4
Color Chromaticity (CIE1931)	White	X	Normal $\theta = \Phi = 0^{\circ}$	-0.03	0.275	+0.03	-	Note 5
		Y			0.290			
	Red	X			0.63			
		Y			0.34			
	Green	X			0.30			
		Y			0.60			
	Blue	X			0.14			
		Y			0.06			

Note 1: Definition of viewing angle range



Note 2: Definition of response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (T_{on}) is the time between photo detector output intensity changed from 90% to 10%, and fall time (T_{off}) is the time between photo detector output intensity changed from 10% to 90%.



Note 3: Definition of contrast ratio

Contrast ratio is calculated by the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "white" state}}{\text{Brightness on the "black" state}}$$

Note 4: Definition of luminance

Measured at the center area of the panel when LCD panel is driven at "white" state.

Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at the center point of LCD when panel is driven at "White", "Red", "Green" and "Blue" state respectively.

7.THE STANDARD OF INSPECTION

检验项目	检验标准	检测工具	缺陷等级
凹凸坑/异色点/白点	①.0.15mm<D≤0.3mm, (S≤0.05mm ²) J≥10mm, N≤3, 明显、亮点不可; ②.J≥10mm, D≤0.15mm 忽略不计, 但不可密集(10mm 区域内 N≥2为密集)	目视、点规卡、卡尺	Min
透光	B 区: 0.15mm<D≤0.25mm, N≤2, J≥20mm D>0.30mm 不允许	目视、点规卡、卡尺	Min
软划伤	全区域: (W: 宽度, L: 长度, N: 个数,) W≤0.05mm, 不限, J≥2mm; W≤0.1mm, L≤5mm, N≤1; W≤0.08mm; L≤5mm N≤2; W>0.2mm, L>5mm 不允许	目视、点规卡、卡尺	Min
硬划伤	可视区不可以, 其他区域允许	目视、点规卡、卡尺	Min
气泡/污斑	D<0.3 mm (S<0.13 mm ²) 且 N<2	目视、点规卡、卡尺	Min
脏污	可擦脏污允许	目视、点规卡、卡尺	MAJ
崩角/边	可视区不可见, 不影响产品功能	目视、点规卡、卡尺	MAJ

裂痕/纹	不允许	目视、点规卡、卡尺	MAJ
手印	不允许	目视	MAJ
TP 牛顿环	小于 TP 面积的 1/6	目视、点规卡、卡尺	MAJ
漏光	不允许	目视、点规卡、卡尺	MAJ
背胶粘性不良	不允许	目视、点规卡、卡尺	MAJ
显示屏黑线/残影/花屏	不允许	目视、点规卡、卡尺	MAJ
显示屏黑点	$0\text{mm} < D \leq 0.15\text{mm}$, $J \geq 10\text{mm}$, $N \leq 3$, (10mm 区域内 $N \geq 2$ 为密集), 黑点不可在界面白色区域	目视、点规卡、卡尺	MAJ
颜色	与标准样板 (或颜色上下限度样板) 符合	目视、点规卡、卡尺	MAJ

偏位	ITO Film 与 lens 断差 $\leq 0.2\text{mm}$ 与配件（面壳）实配无影响	目视、点规卡、卡尺	MAJ
FPC	金手指断（裂）、折痕、分层、氧化、破损、露铜、少元件不允许	目视、点规卡、卡尺	MAJ

8.RELIABILITY TESTS

ITEM	CONDITION	CRITERION
Operating Temperature Test	High Temperature: +60 °C, 240 hrs	No defects in display and operational functions
	Low Temperature: -10 °C, 240 hrs	
Storage Temperature Test	High Temperature: +70 °C, 240 hrs	No defects in display and operational functions
	Low Temperature: -10 °C, 240 hrs	
Humidity Endurance Test	40°C, 90%RH, 240 hrs	No defects in display and operational functions
Thermal Shock Test	-20 °C (30mins)~ +70 °C (30mins) 10 cycles	No defects in display and operational functions
Electro Static Discharge	± 4KV, Human BodyMode, 150pF/330Ω; ± 8KV, Air Mode, 150pF/330Ω	No defects in display and operational functions

NOTE:

- 1) The samples must be free from defect before test, must be restored at room condition at least for 2 hours after reliability test before any inspection.
- 2) Before test the function of TP, the sample must be placed in room temperature for 24hrs after RA test.

9. PRECAUTIONS

9.1. Handling

- 9.1.1. Polarizer Cleaning, Petroleum ether (or N-hexane) is recommended for cleaning the front/rear polarizers and reflectors, acetone, toluene and ethanol are not allowed to avoid damaging the surface.
- 9.1.2. Body grounding, must wear Anti-ESD wrist strap while pick up LCDs.
- 9.1.3. FPC Soldering, less than 300°C/3S, solder must be grounding on grounding bench.
- 9.1.4. If use electric Screwdriver to do assembly, screwdriver must be grounding.

9.2. Storage

- 9.2.1. Keep in a sealed polyethylene bag.
- 9.2.2. Keep in a dark place.
- 9.2.3. Keep in temperature between 0°C and 35°C.
NOT allowed at 70°C for more than 160 Hours, or at -20°C for more than 48 Hrs.

9.3. Safety

If liquid crystal leak out of a damaged glass cell, DO NOT put it in your mouth or touch eyes, if the liquid crystal touch your skin or clothes, please wash it off immediately using soap and water.

10. LIMITED WARRANTY

Unless otherwise agreed between SUPERVIEW and customer, SUPERVIEW will replace or repair any of its LCD modules which are found to be functionally defective when inspected in accordance with SUPERVIEW LCD acceptance standards (copies available upon request) for a period of one year from date of shipments. Cosmetic/visual defects over specs must be returned to SUPERVIEW within 30 days of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of SUPERVIEW limited to repair and/or replacement on the terms set forth above. SUPERVIEW shall not be responsible for any subsequent or consequential events.

10.1. Returning Lcm Under Warranty – Terms And Conditions

10.1.1. No warranty can be granted if the precautions stated above have been disregarded. The typical examples of violations are :

- Broken LCD glass.
- Circuit modified in any way, including addition of components.

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