

1. GENERAL SPECIFICATION

1.1 Description

The G15403AE01A0 is a color active matrix Thin Film Transistor (TFT) Liquid Crystal Display (LCD) that uses amorphous silicon(a-Si) TFT. This model is composed of a single 1.54 inches transmissive type main TFT-LCD panel. The resolution of the panel is 240RGBx240 pixels and can display up to 262Kcolor.

1.2 Feature

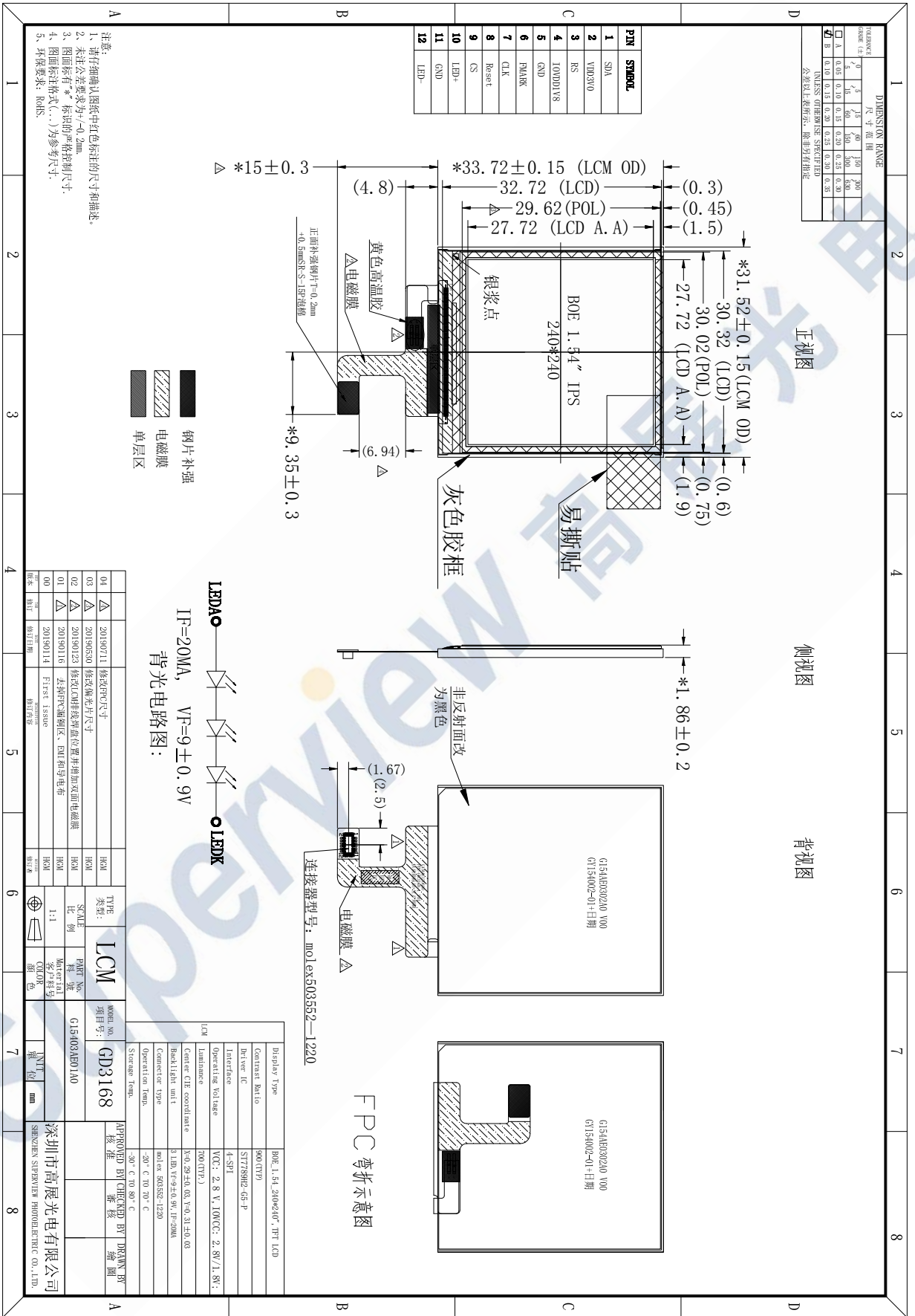
- IPS type for main TFT-LCD panel
- Structure COG+FPC+BL
- Full, Normal (Still), Partial, Sleep mode are available

1.4 General Specification

No.	Item	Specification	Unit	Remark
1	LCD Size	1.54	inch	-
2	Panel Type	a-Si TFT active matrix	-	-
3	Resolution	240 x (RGB) x 240	pixel	-
4	Display Mode	Normally Black, Transmissive mode	-	-
5	Display Number of Colors	262K	-	-
6	Viewing Direction	ALL	-	Note
7	Contrast Ratio	900(Typ)	-	-
8	Luminance	700(Typ)	cd/m ²	-
9	Module Size	31.52(W) x33.72(L) x 1.86(T)	mm	Note
10	Active Area	27.72(W) x 27.72(L)	mm	Note
11	Pixel Pitch	0.1155 (H) × 0.1155 (V)	mm	-
12	Driver IC	ST7789H2-G5-P	-	-
13	Light Source	3 LEDs White	-	-
14	Interface	4-SPI	-	-
15	Operating Temperature	-20~70	°C	-
16	Storage Temperature	-30~80	°C	-

Note: Please refer to the mechanical drawing.

2. MECHANICAL DRAWING



REV	DATE	BY	CHK	DESCRIPTION
04	20190711	修改PCB尺寸	HCH	
03	20190530	修改背光尺寸	HCH	
02	20190123	修改EM膜位置并增加双面电磁膜	HCH	
01	20190116	去掉FPC灌胶区, EM和导电布	HCH	
00	20190114	First Issue	HCH	
版本	修订日期	修订内容	修订人	

TYPE	LCM	MODEL NO.	APPROVED BY
类型:	项目号:	GD3168	核准
SCALE	PART No.	G154003A01A0	审核
比例	料号		编制
1:1	Material		
	客户料号		
	COLOR		
	颜色		
	UNIT		
	单位		
	mm		
深圳市高展光电有限公司			
SHENZHEN SUPERVIEW PHOTOELECTRIC CO., LTD.			

Display Type	BOE 1.54 240x240" TFT LCD
Contract Ratio	900(TVP)
Driver IC	S7729H02-05-P
Interface	4-SPI
Operating Voltage	VCC: 2.8 V, I/OVCC: 2.8V/1.8V
Luminaire	700(TVP)
Center-Clie coordinate	X:0.29±0.06, Y:0.31±0.03
Bezel Height	mm 1.18, Y2=±0.09, IF=20MA
Connector type	mo lex 503552-1220
Operation Temp.	-30° C TO 70° C
Storage Temp.	-30° C TO 80° C

3. ELECTRICAL SPECIFICATION for TFT

3.1. TFT ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
Power Supply for Analog	VCC	Ta=25 °C	-0.3	-	5.5	V
Power Supply for Digital IO	IOVCC	Ta=25 °C	-0.3	-	3.5	V

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

3.2. TFT TYPICAL OPERATION CONDITION

3.2.1 TFT DC Characteristics

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
Power Supply for Analog	VDD	Ta=25 °C	2.5	2.8	3.5	V
Power Supply for Digital IO	IOVDD	Ta=25 °C	1.65	1.8	3.3	V
Input Signal "H" Level	V _{IH}	-	0.7IOVDD	-	IOVDD	V
Input Signal "L" Level	V _{IL}	-	0	-	0.3IOVDD	V
Output Signal "H" Level	V _{OH}	I _{OH} =-1.0mA	0.8IOVDD	-	IOVDD	V
Output Signal "L" Level	V _{OL}	I _{OL} =1.0mA	0	-	0.2IOVDD	V
Frame Frequency	FRAME	-	50	70	80	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. 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	$CR \geq 10$	75	80	-	degree	Note 1
	Right	θ_R		75	80	-		
	Top	Φ_T		75	80	-		
	Botto	Φ_B		75	80	-		
Response Time	$T_{on} + T_{off}$	Normal $\theta = \phi = 0^{\circ}$	-	30	35	ms	Note 2	
Contrast Ratio	CR	Normal $\theta = \phi = 0^{\circ}$	700	900	-	-	Note 3	
Luminance	L	Normal $\theta = \phi = 0^{\circ}$	-	700	--	cd/m^2	Note 4	
Color Chromaticity	White	X	Normal $\theta = \phi = 0^{\circ}$	-0.03	0.29	+0.03	-	Note 5
		Y			0.31			
Transmittance	Trans		4.6	5.4	-	%	Note 6	

Note 1: Definition of viewing angle range

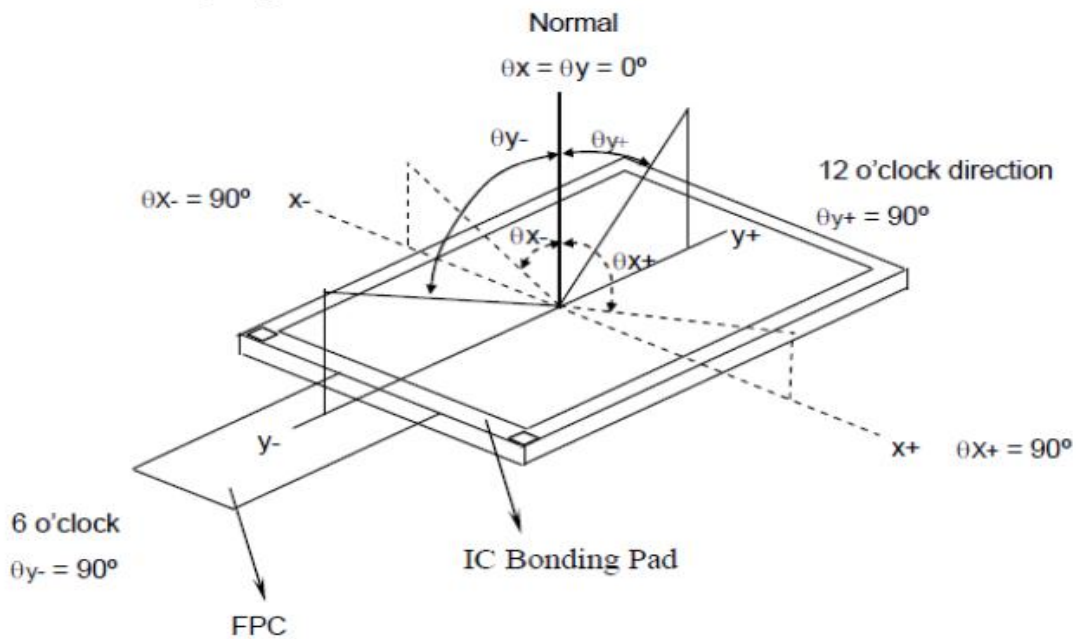


Fig. 1 Optical measurement system setup

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%.

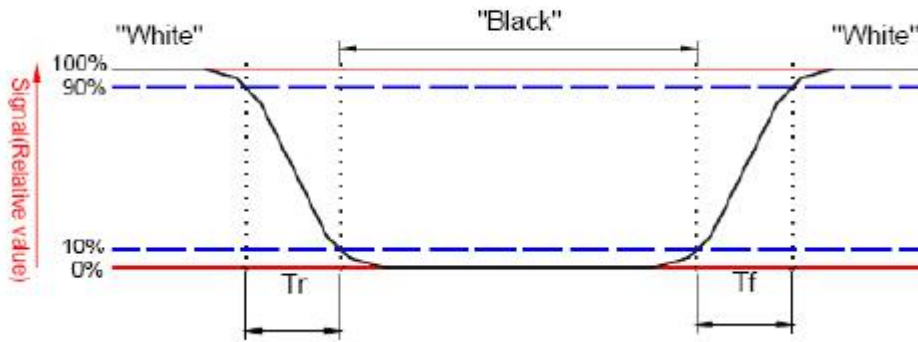


Fig. 2 Definition of response time

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.

Note 6: CTC shipping status is cell without polarizer. Transmittance of Specification is cell with polarizer. The tolerance of Transmittance is +/-10%.

5.RELIABILITY TESTS

ITEM	CONDITION	CRITERION
Operating Temperature Test	High Temperature: +70 °C, 96hrs	No defects in display and operational functions
	Low Temperature: -20 °C, 96 hrs	
Storage Temperature Test	High Temperature: +80 °C, 96 hrs	No defects in display and operational functions
	Low Temperature: -30 °C, 96hrs	
Humidity Endurance Test	60 °C±3°C, 90%±3%RH, 96 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
Vibration Resistance Test	Operating Time: thirty minutes exposure for each direction (X,Y,Z) Sweep Frequency:10~55Hz (1 min) Amplitude: 1.5mm	No defects in display and operational functions
Mechanical Shock	Height :76cm (Weight ≤9.5kg); 61cm(9.5<Weight ≤ 18.6kg) 1 corner, 3 edges, 6 surfaces	No defects in display and operational functions
Electro Static Discharge	± 6KV, 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.