

1. GENERAL SPECIFICATION

1.1 Description

The G397AQA985A0(GF3017G V00) 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 3.97 inches transmissive type main TFT-LCD panel. The resolution of the panel is 480RGBx800 pixels and can display up to 16.7M color.

1.2 Feature

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

1.3 Application

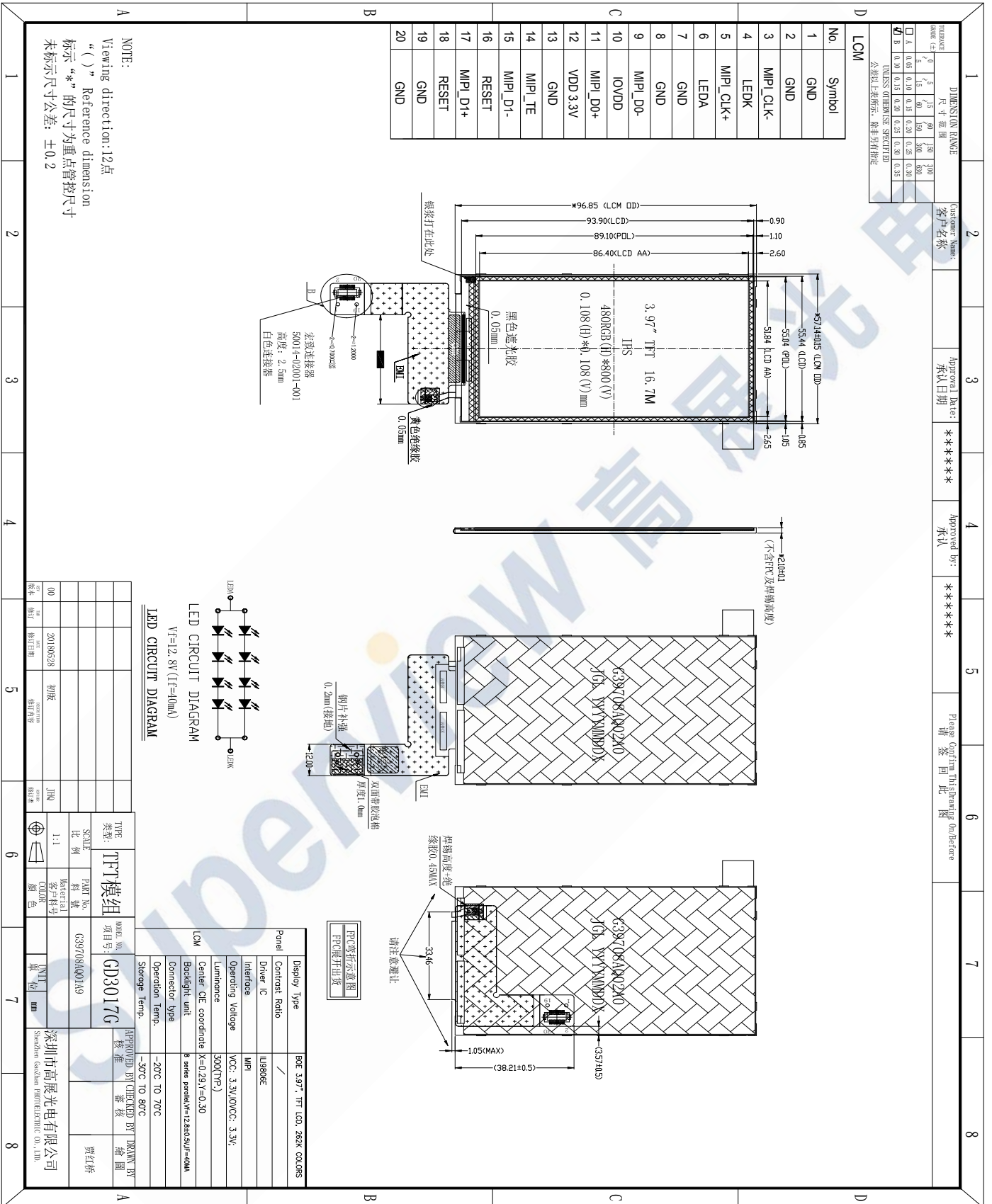
- Display terminals for electric bicycle

1.4 General Specification

No.	Item	Specification	Unit	Remark
1	LCD Size	3.97	inch	-
2	Panel Type	a-Si TFT active matrix	-	-
3	Resolution	480 x (RGB) x 800	pixel	-
4	Display Mode	Normally Black, Transmissive	-	-
5	Display Number of Colors	16.7M	-	-
6	Viewing Direction	ALL	-	Note
7	Contrast Ratio	800(Typ)	-	-
8	Luminance	255(Typ)	cd/m ²	-
9	Module Size	66.64(W) x 111.77(L) x 2.1(T)	mm	Note
10	Active Area	51.84(W) x 86.4(L)	mm	Note
11	Pixel Pitch	0.108(W) x 0.108 (L)	mm	-
12	Driver IC	ILI9806E	-	-
13	Light Source	8 LEDs White	-	-
14	Interface	MIPI 2-Lane	-	-
15	Operating Temperature	-20~70	°C	-
16	Storage Temperature	-30~80	°C	-

Note: Please refer to the mechanical drawing.

2. MECHANICAL DRAWING



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.

3.2.2 TFT Current Consumption

Item	Symbol	Values		Unit	Remark
		type	Max.		
MIPI 2-Lane Interface					
Normal(Still) Mode	I _{CC1}	40	60	mA	Note1
Standby Mode	I _{CC1}	-	150	uA	Note2

Note1: Test Condition

Typ: IOVCC=VCI=2.85V

Display Pattern: All Pixel White

Frame Rate=60Hz at 2-dot Inversion

4. LCD OPTICAL CHARACTERISTICS

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

Item	Symbol	Condition	Values			Unit	Remark	
			Min.	Typ.	Max.			
Viewing Angle Range	Left	θ_L	$CR \geq 10$	80	85	-	degree	Note 1
	Right	θ_R		80	85	-		
	Top	Φ_T		80	85	-		
	Botto	Φ_B		80	85	-		
Response Time	$T_{on} + T_{off}$	Normal $\theta = \Phi = 0^{\circ}$	-	35	-	ms	Note ,2	
Contrast Ratio	CR	Normal $\theta = \Phi = 0^{\circ}$	550	800	-	-	Note 3	
Luminance	L	Normal $\theta = \Phi = 0^{\circ}$	-	255	--	cd/m ²	Note 4	
Color Chromaticity (CIE1931)	White	X	Normal $\theta = \Phi = 0^{\circ}$	0.277	0.292	0.307	-	Note 5
		Y		0.318	0.333	0.348		
	Red	X		0.650	0.665	0.680		
		Y		0.308	0.323	0.338		
	Green	X		0.257	0.272	0.287		
		Y		0.573	0.588	0.613		
	Blue	X		0.119	0.134	0.149		
		Y		0.106	0.121	0.136		
Transmittance	Trans		3.34	3.93		%	Note7	

Note 1: Definition of viewing angle range

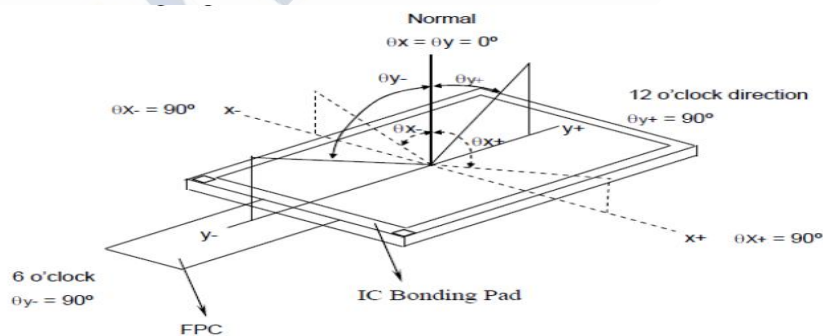


Fig. 1 Optical measurement system setup

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%.

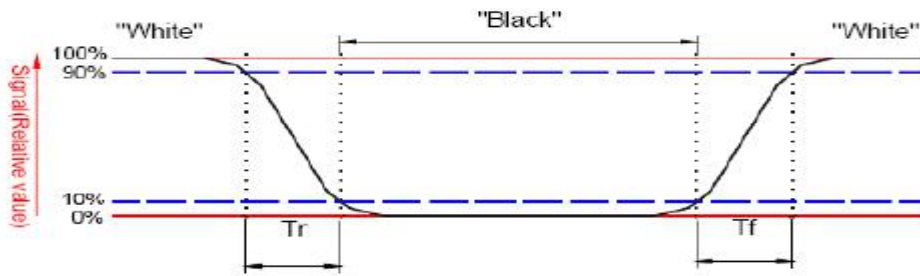


Fig. 2 Definition of response time

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

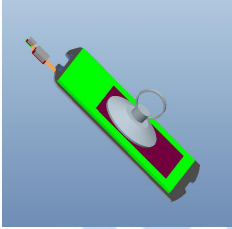
Measured at the center area of the panel when LCD panel is driven at "white" state.

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 7: CTC shipping status is cell without polarizer. Transmittance of Specification is cell with polarizer. Tht 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
框贴背胶剥离力测试	1、用积水背胶贴在屏框背面的中间 2、吸盘粘附在积水背胶上，对应屏的中心位置 3、进行拉力测试:>5KG 	TP 和 LCD 不分离
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	± 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.