

1. GENERAL SPECIFICATION

1.1 Description

The **G03506AK01A4 (GD3248 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. This model is composed of a single 3.5 inches transmissive type main TFT-LCD panel. The resolution of the panel is 320x240 pixels and can display up to 16.7M color.

1.2 Feature

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

1.3 Application

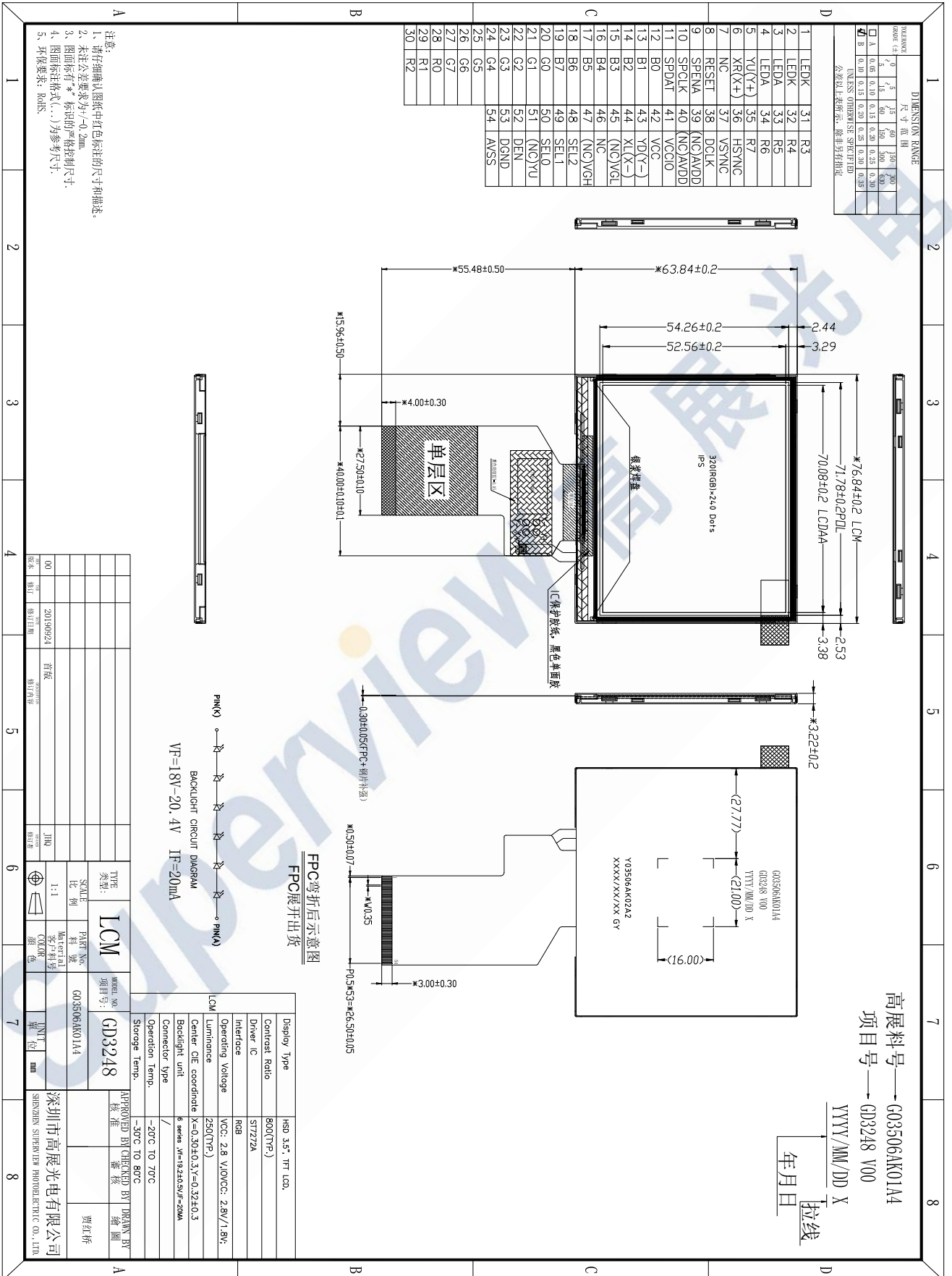
- Display terminals for POS

1.4 General Specification

No.	Item	Specification	Unit	Remark
1	LCD Size	3.5	inch	-
2	Panel Type	a-Si TFT transmissive	-	-
3	Resolution	320 x (RGB) x 240	pixel	-
4	Display Mode	Normally Black , Transmissive	-	-
5	Display Number of Colors	16.7M	-	-
6	Viewing Direction	Free	-	Note
7	Contrast Ratio	800(Typ)	-	-
8	Luminance	350(Typ)	cd/m2	-
9	Module Size	76.84(W) x 63.84(L) x3.22(T)	mm	Note
10	Active Area	70.08(W) x 52.56(L)	mm	Note
11	Pixel Pitch	0.219(W) x 0.219 (L)	mm	-
12	Weight	TBD(TYP)	g	-
13	Driver IC	ST7272A	-	-
14	Light Source	6 White LEDs	-	-
15	Interface	SPI+RGB	-	-
16	Operating Temperature	-20~70	°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	-	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.

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	3.3	3.6	V
Power Supply for Digital IO	IOVDD	Ta=25 °C	1.65	3.0	3.6	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	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.

3.2.2 TFT Current Consumption

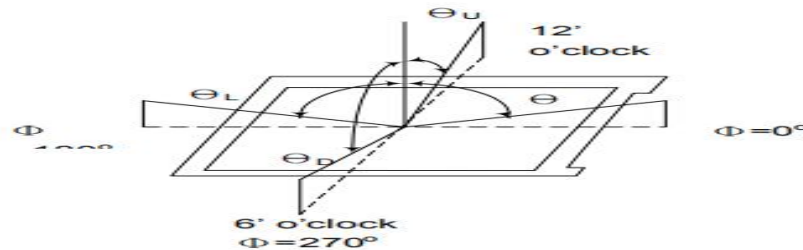
Item	Symbol	Values		Unit	Remark
		type	Max.		
RGB+SPI Interface					
Normal(Still) Mode	I _{CC1}	-	60	mA	Note1
Standby Mode	I _{CC1}	-	150	uA	Note2

4. LCD OPTICAL CHARACTERISTICS

(T_a=+25°C, V_{CI}=+2.85V IOVCC=+1.8V, I_B=20mA)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Transmittance (with Polarizer)	T (%)	Θ=0 Normal viewing angle	(5.5)	(6.2)	—	%	Measuring with normal polarizer · Reference Only Base on Vop=5.1V
Transmittance (without Polarizer)	T (%)		19.1	21.3	—	%	
Contrast Ratio	CR		640	800	—	—	(1)(2)
Response Time	T _R +T _F		—	30	40	msec	(1)(3)
Color Gamut (%)			55	60	—	%	C-light
Color Chromaticity (CIE1931)	White	W _x	(0.297)	(0.317)	(0.337)	—	(1)(4) CF glass C-light
		W _y	(0.319)	(0.339)	(0.359)		
	Red	R _x	(0.626)	(0.646)	(0.666)	—	
		R _y	(0.312)	(0.332)	(0.352)		
	Green	G _x	(0.303)	(0.323)	(0.343)	—	
		G _y	(0.547)	(0.567)	(0.587)		
	Blue	B _x	(0.114)	(0.134)	(0.154)	—	
		B _y	(0.101)	(0.121)	(0.141)		
Viewing Angle	Hor.	Θ _L	70	80	—	—	(1)(4) Measuring with normal polarizer · Reference Only
		Θ _R	70	80	—		
	Ver.	Θ _U	70	80	—		
		Θ _D	70	80	—		
Optima View Direction		Free					(5)

Note 1: Definition of viewing angle range

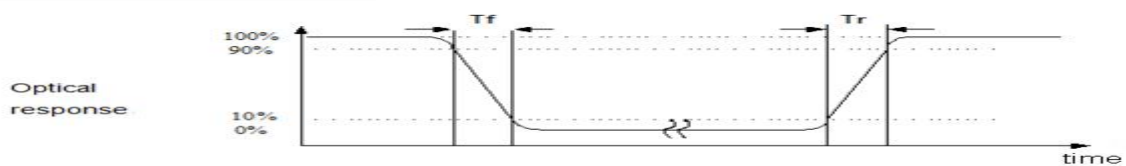


Note 2: Definition of Contrast Ratio (CR) :

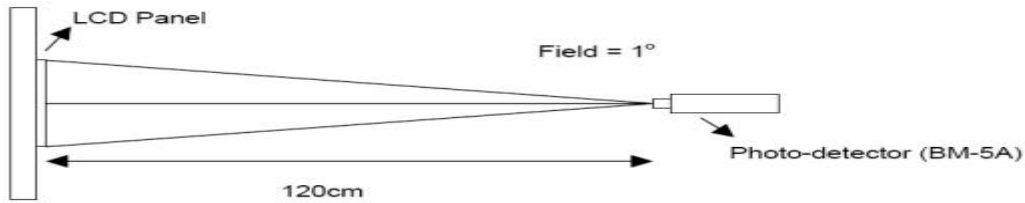
measured at the center point of panel

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

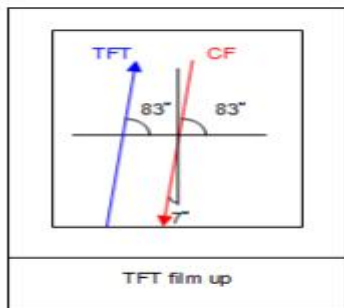
Note 3: Definition of Response Time : Sum of TR and TF



Note 4: Definition of optical measurement setup



Note 5: Rubbing Direction (The different Rubbing Direction will cause the different optima view direction.)



5.RELIABILITY TESTS

ITEM	CONDITION	CRITERION
Operating Temperature Test	High Temperature: +60 °C, 96 hrs	No defects in display and operational functions
	Low Temperature: -20 °C, 96 hrs	
Storage Temperature Test	High Temperature: +70 °C, 96 hrs	No defects in display and operational functions
	Low Temperature: -30 °C, 96 hrs	
Humidity Endurance Test	60°C, 90%RH, 48 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
Electro Static Discharge	± 4KV, Human BodyMode,150pF/330Ω; ± 8KV,Air Mode,150pF/330Ω	No defects in display and operational functions