AND Displays

AND-TFT-070WL3

800 x 480 Pixels
LCD Color Monitor

The AND-TFT-070WL3 is a compact full color TFT LCD module with CCFL backlight unit. This display is suitable for industrial video monitor, test equipments and medical test equipments monitoring devices.

This device consists of amorphous silicon TFT liquid crystal display with CCFL B/L unit. The display has 800 x 480 pixels on a 7.0 inch diagonal screen. 16:9 wide aspect ratio.

Features

- Wide VGA (800 x 480 pixel) resolution
- 7.0 inch (16 cm) diagonal screen
- Amorphous silicon TFT LCD panel with backlight unit
- Pixel in stripe configuration
- Thin and lightweight
- Display colors: 262, 144 colors
- +3.3V LVDS interface standard
- +3.3V DC supply voltage for TFT LCD panel driving
- Backlight driving DC/AC inverter not included in this module
- Long life lamp
- Wide viewing angle
- **RoHS compliant**

Mechanical Characteristics

Item	Specification	Unit
Screen Size	7.0 inch (16.9 cm) diagonal	–
Display Format	800 x (R, G, B) x 480	dot
Display Colors	262,144	
Active Area	152.4 (H) x 91.44) V)	mm
Pixel Pitch	0.1905 (H) x 0.1905 (V)	mm
Pixel Configuration	stripe	–
Outline Dimension	166.3 (W) x 105.3 (H) x 10.7(D)	mm
Weight	265 ± 10	g
Backlight	CCFL, 1 tube	–
Surface Treatment	Anti-glare and Wide View Film	–
Display Mode	Normally white	–
Gray Scale Inversion Direction	6 o'clock	–

Absolute Maximum Rating

Item	Symbol	Remarks	Specifications		Unit
			Min.	Max.	
Supply Voltage	VCC		-0.3	+4.0	V
Input Signals Voltage	Vin	LVDS signal	-0.3	VCC +0.3	V
Backlight Driving Frequency	F_L		0	100	KHz
Operating Temperature	–		-10	+60	ºC
Storage Temperature	–		-20	+70	ºC

Product specifications contained herein may be changed without prior notice. It is therefore advisable to contact Purdy Electronics before proceeding with the design of equipment incorporating this product.

Electrical Characteristics - Recommended Operating Conditions: GND = 0V, Ta = 25ºC

Item	Symbol	Specifications			Unit
		Min.	Typ.	Max.	
Supply Voltage	V_{CC}	3.0	3.3	3.6	V
Current Dissipation	I_{CC}	–	199.2	217.3	mA
LVDS Differential Input High Threshold	V_{TH}	–	–	100	mV
LVDS Differential Input Low Threshold	V_{TL}	-100	–	–	–
V_{COM} Voltage	V_{COM}	–	3.1	–	V

Backlight Driving

Pin #	Symbol	Description	Remark
1	VL1	Input terminal (Hi voltage side)	
2	VL2	Input terminal (Low voltage side)	Low voltage side of backlight inverter conects with ground of inverter circuits.

Recommended Driving Condition for Back Light: Ta = 25ºC

Item	Symbol	Specifications			Unit	Remark
		Min.	Typ.	Max.		
Lamp Voltage	V_L	522	580	638	V	I_L=6mA
Lamp Current	I_L	4	6	7	mA	Note 1
Lamp Frequency	P_L	45	60	80	KHz	Note 2
Starting Voltage (25 ºC) (Reference Value)	V_S	–	–	1090	Vrms	Note 3
Starting Voltage (0 ºC) (Reference Value)	V_S	–	–	1420	Vrms	Note 3

Note 1: In order to satisfy the quality of B/L, no matter the type of inverter, the output lamp current must be between Min. and Max. to avoid abnormal display image caused by B/L.
Note 2: The waveform of lamp driving voltage should be as closed to a perfect sine wave as possible.
Note 3: The Max. of starting voltage means the minimum voltage of inverter to turn on the CCFl and it should be applied to the lamp for more than 1 second to start up. Otherwise the lamp may not be turned on.

Backlight Power Consumption

Item	Specifications		Unit	Remarks
	Typ.	Max.		
LCD Power consumption (W/O BL)	0.66	0.72	W	
Backlight Power Consumption	3.48	4.47	W	Note 1
Total Power Consumption	4.17	5.19	W	
Note 1: Backlight lamp power consumption is calculated by I_L x V_L				

Pin Description: TFT-LCD Panel Driving - Connector

Pin #.	Symbol	Description
1	VCC	+3.3 V Power Supply
2	VCC	+3.3V Power Supply
3	GND	Ground
4	GND	Ground
5	IN0-	LVDS receiver signal channel 0
6	IN0+	LVDS receiver signal channel 0
7	GND	Ground
8	IN1-	LVDS receiver signal channel 1
9	IN1+	LVDS receiver signal channel 1
10	GND	Ground
11	IN2-	LVDS receiver signal channel 2
12	IN2+	LVDS receiver signal channel 2
13	GND	Ground
14	CLK-	LVDS receiver signal clock
15	LCK+	LVDS receiver signal clock
16	GND	Ground
17	NC	No Connection
18	NC	No Connection
19	GND	Ground
20	GND	Ground

Type: DF19K20P-1H (56)(HRS)

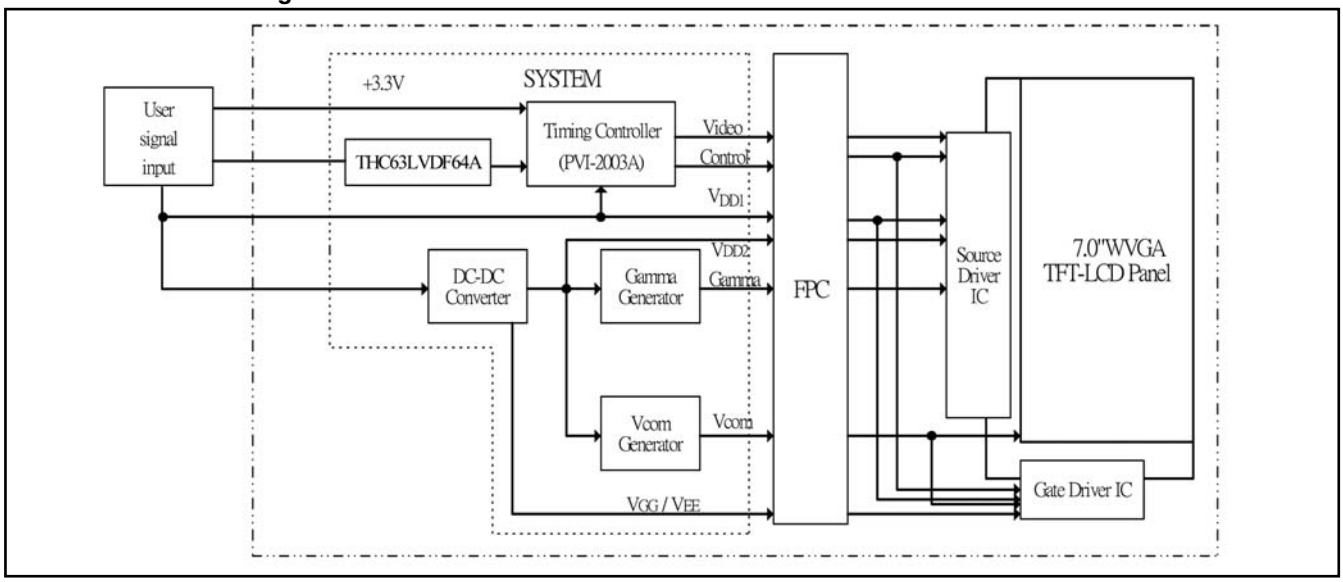
Optical Characteristics: Ta = 25°C

Item		Symbol	Condition	Specifications			Unit
				Min.	Typ.	Max.	
Viewing Angle	Horozontal	θ 21.22	CR≥ 10	± 55	± 60	–	deg.
	Vertical	θ (to 12 o'clock)		35	40	–	deg.
		θ (to 6 o'clock)		50	55	–	deg.
Contrast Ration		CR	θ = 0°	250	400	–	–
Response Time	Rise	Tr	θ = 0°	–	15	30	ms
	Fall	Tf		–	25	50	ms
Brightness		L	θ = 0° / ψ = 0	350	400	–	cd/m^2
Luminance Uniformity		U	–	70	75	–	%
White Chromaticity		x	θ = 0° / ψ = 0	0.27	0.30	0.33	–
		y		0.297	0.327	0.357	–
Cross Talk		–	θ = 0°	–	–	3.5	%
Lamp Life Time		–	–	25,000	–	–	hr

Display Color and Gray Scale Reference

Color		Input Color Data																	
		Red						Green						Blue					
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
Basic Color	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red (63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	Green (63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	Blue (63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale of Red	Red (00)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dark	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
					:						:						:		
					:						:						:		
		1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	Light	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red (63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale of Green	Green (00)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dark	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
					:						:						:		
					:						:						:		
		0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
	Light	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
Gray Scale of Blue	Blue (00)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
					:						:						:		
					:						:						:		
		0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
	Light	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	Blue (63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

TFT Module Block Diagram

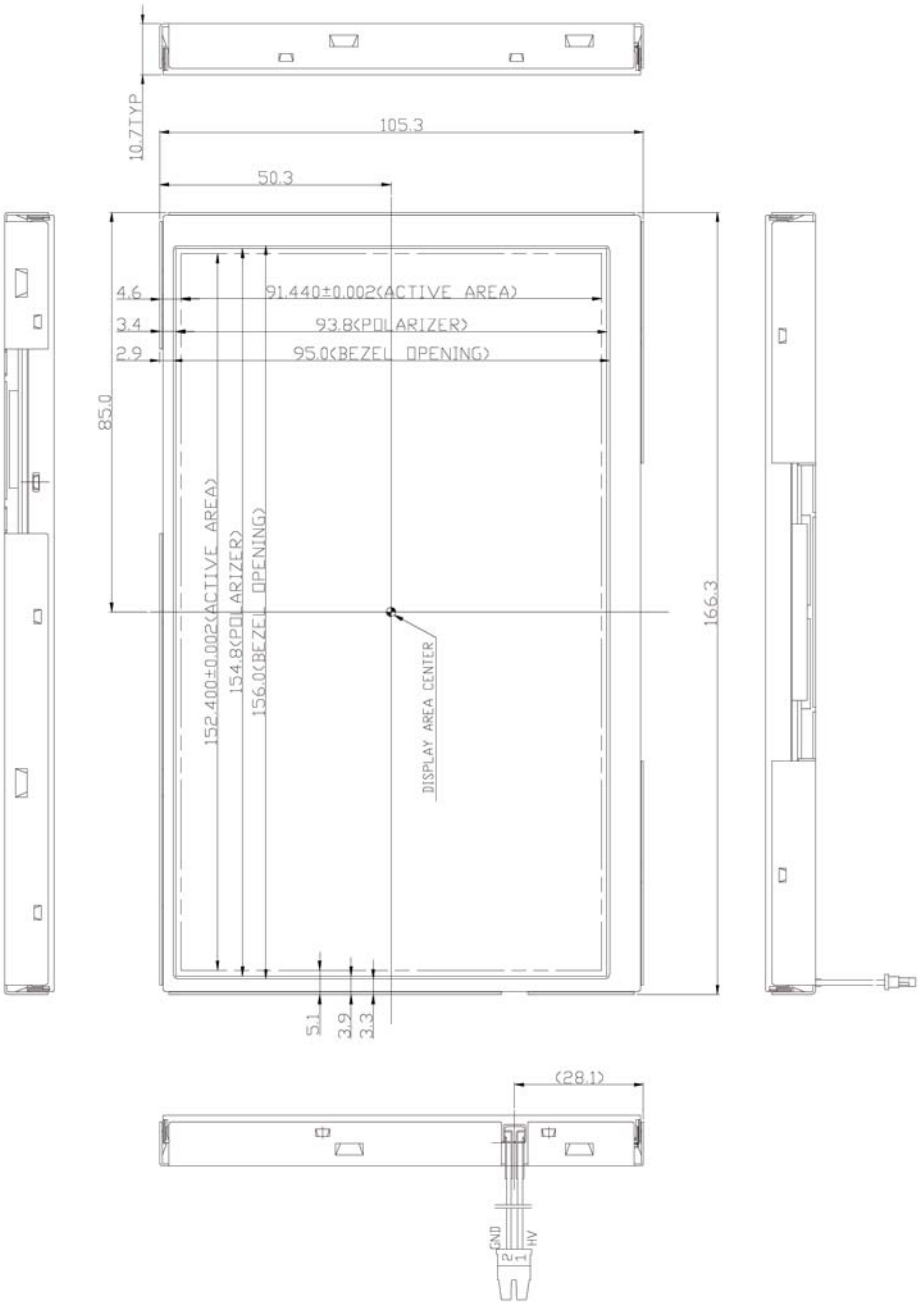


Timing Parameters - Interface Timing

Item		Symbol	Min.	Typ.	Max.	Unit
Power Supply		VCC	3.0	3.3	3.6	V
CLK	Frequency	1/tc	–	32	–	MHz
		tc	–	31.25	–	ns
HSYNC	Period	Hp	–	33	–	us
			–	1056	–	tc
	Display Period	Hdp	–	800	–	tc
	Pulse Width	Hpw	–	128	–	tc
	Back-porch	Hbp	–	86	–	tc
	Front-porch	Hfp	–	42	–	tc
	Hpw+Hbp	–	–	214	–	tc
	Hsync-CLK	Hhc	10	–	Tc-10	ns
	Vsynch-Hsync	Hvh	0	0	200	tc
VSYNC	Period	Vp	–	17.325	–	ms
			–	525	–	Hp
	Display period	Vdp	–	480	–	Hp
	Pulse width	Vpw	–	2	–	Hp
	Back-porch	Vbp	–	33	–	Hp
	Front-porch	Vfp	–	10	–	Hp
	Vpw+Vbp	–	–	35	–	Hp
DENB	Horizontal scanning period	T1	860	1056	1064	tc
	Horizontal disp;lay period	T2	–	800	–	tc
	Vertical display period	T3	–	480	–	T1
	Frame cycling period	T4	520	525	800	T1
R, G, B	CLK-DATA	Dcd	10	–	–	ns
	DATA-CLK	Dde	8	–	–	ns

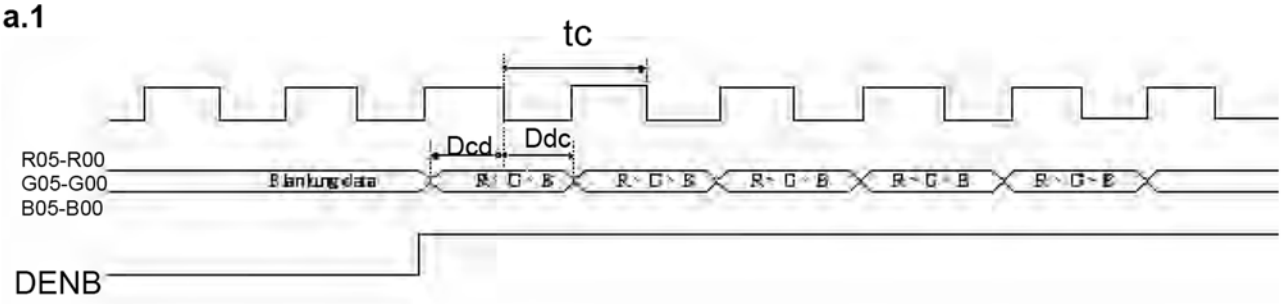
Dimensional Outline

General mechanical tolerance = 0.5mm

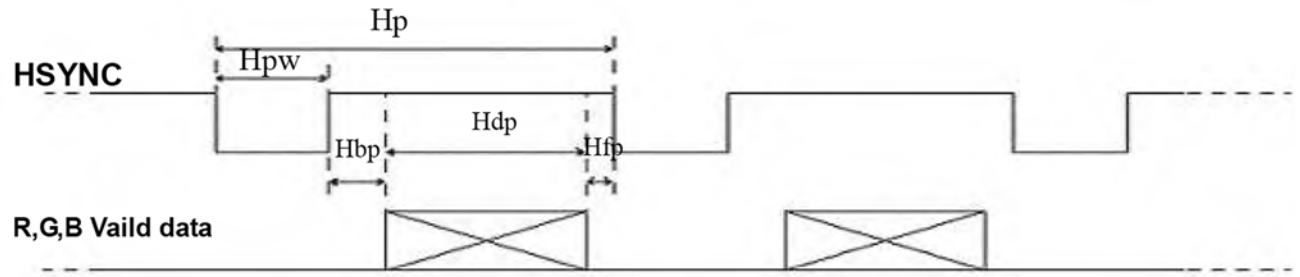


The Timing Diagram
a. Input signal range

a.1

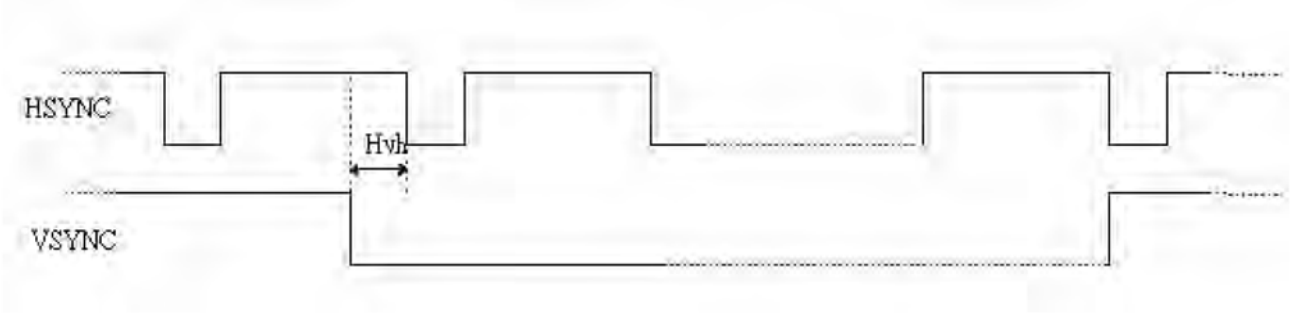


a.2 HSYNC timing

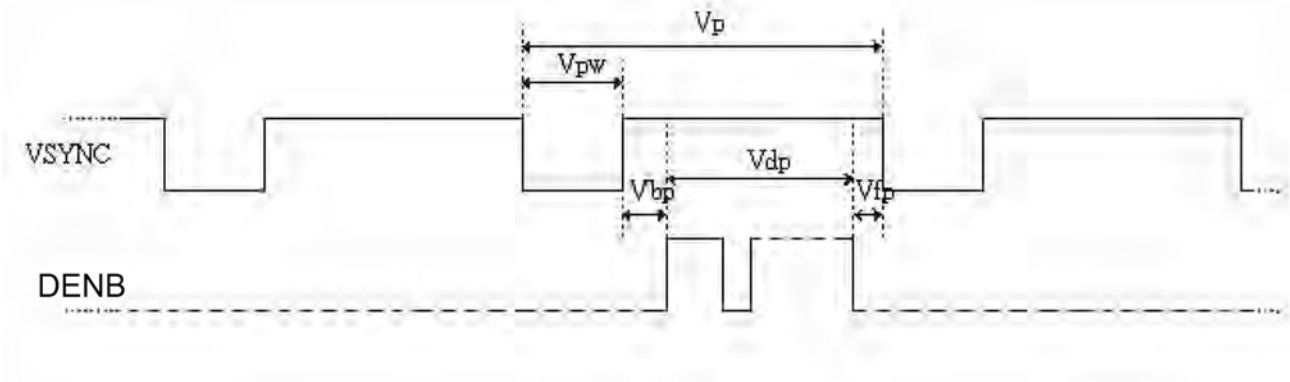


a.3 CLK,HSYNC relationship

a.4 HSYNC, VSYNC relationship



a.5 VSYNC timing



a.6 DENB timing