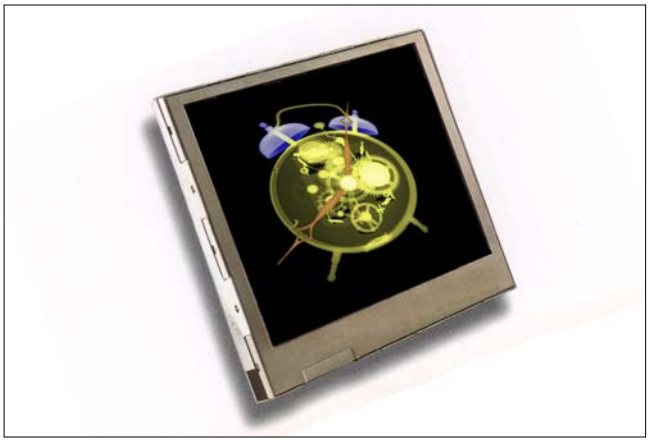

AND-TFT-35PA-LED

3.5" TFT LCD
LCD Color Monitor

The AND-TFT-35PA-LED is a compact full color TFT LCD module, that is suitable for camcorder, digital camera applications and other electronic products which require high quality flat panel displays. This device consists of a twisted nematic (TN) liquid crystal cell, that incorporates a TFT-array that has 160 x 234 pixels on a 3.5 inch diagonal screen, X and Y drivers, an LSI controller, and a built-in CCFL backlight.

Features

- Long life LED backlight
- No controller chip is necessary
- Compatible with NTSC or PAL system (switchable)
- High Resolution: 160 x 234
- Optimum viewing direction: 6 o'clock
- Up/Down and Left/Right image inversion

Mechanical Characteristics

Item	Specification	Unit
Screen Size	3.5 inch diagonal	inch
Outline Dimensions	83.7 (W) x 68.6 (H) x 8.1 (D)	mm
Active Area	72.0 (W) x 50.54 (H)	mm
Input Signal	NTSC/PAL	–
Pixel Number (RGB trio)	160 (W) x 234 (H)	–
Sub Pixel Arrangement	Delta	–
Dot Pitch	0.149 (W) x 0.225 (H)	mm
Weight	TBD	g

Absolute Maximum Rating

Item			Symbol	Conditions	Absolute Maximum Rating		Unit
					Min.	Max.	
Supply Voltage	for Source Driver	Analog	AV_{DD}	Ta = 25°C	-0.3	+7.0	V
		Digital	V_{DD}		-0.3	+7.0	
	for Gate Driver	Positive	V_{GH}		-0.3	+45	
		Negative	V_{GL}		-.23	+0.3	
			V_{GH} - V_{GL}		+15	+40	
Analog Input Voltage (means V_R, V_G, V_B)			V_{RGB}		-0.3	+7.3	V
Operating Temperature (define that contrast, response time, other display optical characters are Ta=+25)			Top	–	0	+60	°C
Storage Temperature			Tstg	–	-20	+70	°C
Humidity (No condensation of water)			–	60°C	–	95%	RH

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.

Power Consumption (Ta =25°C)

Item	Symbol	Remarks	Specifications			Units
			Min.	Typ.	Max.	
LCD Panel Power Consumption	–	–	–	18.5	–	mW
Backlight Lamp Power Consumption	–	calculated by I_L x V_L.	–	0.7	–	W
Total Power Consumption	–	–	–	0.72	–	W

Backlight Connector

JST BHR-03VS-2

Recommended Operating Conditions

Item		Symbol	Remarks	Specifications			Unit
				Min.	Typ.	Max.	
Power Supply (Ta = 25°C)		V_{CC}		+4.5	+5.0	+5.5	V
		DV_{DD}		+4.5	+5.0	+5.5	
		AV_{DD}		+4.5	+5.0	+5.5	
		V_{GH}		+14.5	+15.0	+15.5	
		–		–	–	–	
		$V_{GL\ AC}$	AC Component of V_{GL}	–	+6.0	–	V_{P-P}
		$V_{GL\ DC}$	DC Component of V_{GL}	-12.5	-11.0	-9..5	V
Video Signal (V_R, V_G, V_B)		$V_{i\ AC}$	AC Component, Note 2	–	+4.0	+4.2	V_{P-P}
		$V_{i\ DC}$	DC Component	–	+2.5	–	V
V_{COM}		$V_{COM\ AC}$	AC Component of V_{COMM}	–	+6.0	–	V_{P-P}
		$V_{COM\ DC}$	DC Component of V_{COMM}	+1.0	+1.8	+2.0	V
	H Level	V_{IH}	Note 1	+0.7 V_{DD}	–	–	V
	L Level	V_{IL}		–	–	+0.3 V_{DD}	

Note 1: STH1, STH2, CPH1, CPH2, CPH3, Q2H, INH, CPV, XOE, DIO1, DIO2

Note 2: Both NTSC & PAL system Video Signal input waveform is based on 8 steps gray scale.

Optical Specifications

Item		Symbol	Conditions	Specifications			Unit
				Min.	Typ.	Max.	
Viewing Angle	Horizontal	θ	CR≥10	± 45	± 50	–	deg
	Vertical	θ (to 12 o'clock)		10	15	–	
		θ (to 6 o'clock)		30	35	–	
Contrast Ratio Luminance when LCD is White / Luminance when LCD is Black		CR	At optimized viewing angle	100	120	–	–
Response Time	Rise	Tr	θ =0°	–	15	30	ms
	Fall	Tf	ϕ =0°	–	25	50	
Transmission	Ratio	T	–	7.5	8.0	8.5	%
Uniformity		U	–	65	70	–	–
Brightness		LUM	–	200	220	–	cd/m^2
White Chromaticity		X	θ =0°	0.250	0.300	0.350	–
		Y		0.280	0.330	0.380	
		Tc		6650	6850	7050	
Lamp Life Time	+25°C	–	decay to 75%	10,000	12,000	–	hr

Interface Pin Assignment

Pin No.	Symbol	Function	Input/Output	Remark
1	GND	Ground for Gate Driver	–	
2	V_{CC}	Logic power of Gate Driver	Input	DV_{DD}, V_{CC} =+5V (Typ..)
3	V_{GL}	Gate off Voltage (Alternative Every 1-H)	Input	V_{COM} =6V_{PP}
4	V_{GH}	Gate on Voltage	Input	V_{GH}=+15V (Typ..)
5	STVR	Vertical Start Pulse Input, when U/D=High	Input/Output	Note 2
6	STVL	Vertical Start Pulse Input, when U/D=Low	Input/Output	Note 2
7	CKV	Shift clock input for gate driver	–	
8	U/D	Up/Down control for Gate Driver	Input	
9	OEV	Ouptut enable for Gate Driver	Input	
10	V_{COM}	Common Electrode Voltage	Input	V_{COM} =6V_{PP}
11	V_{COM}	Common Electrode Voltage	Input	V_{COM} =6V_{PP}
12	GLED1	Ground of LED 1	–	
13	VLED1	Voltage of LED 1	–	
14	VLED2	Voltage of LED 2	–	
15	GLED2	Ground of LED 2	–	
16	L/R	Left/Right for Source Driver	Input	Note 1
17	Q1H	Analog signal rotate input	–	
18	OEH	Output enable for Source driver	–	
19	STHL	Start Pulse for Source Driver input, when L/R=High	Input/Output	Note 1
20	STHR	Start Pulse for Source Driver input, when L/R=Low	Input/Output	Note 1
21	CPH3	Sampling and Shift Clock for Source Driver	Input	
22	CPH2	Sampling and Shift Clock for Source Driver	Input	
23	CPH1	Sampling and Shift Clock for Source Driver	Input	
24	DVDD	Logic power input of Source driver	–	
25	DVSS	Ground of Source driver	–	
26	V_R	Video Input R	Input	V_{COM} =6V_{PP}
27	V_G	Video Input G	Input	V_{COM} =6V_{PP}
28	V_G	Video Input B	Input	V_{COM} =6V_{PP}
29	AV_{DD}	Analog Power Input of Source Driver	Input	AV_{DD}=+5V (Typ..)
30	AV_{SS}	Analog GND of Source Driver	Input	

Note 1: STHL, STHR and R/L mode

R/L	STHL	STHR	Remarks
High (VDD)	Input	Output	Left to Right
Low (0 Volt.)	Output	Input	Right to Left

Note 2: STVR STVL and U/D mode

U/D	STVR	STVL	Remarks
High (VDD)	Input	Output	Down to Up
Low (0 Volt.)	Output	Input	Up to Down

Dimensional Outline