AND-TFT-35PA

3.5" TFT LCD
LCD Color Monitor

The AND-TFT-35PA 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

• 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

• Anti-glare

• **RoHS compliant**

Mechanical Characteristics

Item	Specification	Unit
Screen Size	3.5 inch diagonal	inch
Outline Dimensions	83.7 (W) x 68.6 (H) x 6.6 (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	0.150 (W) x 0.216 (H)	–
Dot Pitch	0.149 (W) x 0.225 (H)	mm
Weight	58±5	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_{VIDEO}		-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.

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Power Consumption

Item	Symbol	Remarks	Specifications			Units
			Min.	Typ.	Max.	
LCD Panel Power Consumption	–	–	–	TBD	–	mW
Backlight Lamp Power Consumption	–	calculated by I_L x V_L.	–	0.79	–	W
Total Power Consumption	–	–	–	TBD	–	W

(Ta =25°C)

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
		V_{DD}		+3.0	+3.3	+3.6	
		AV_{DD}		+4.5	+5.0	+5.5	
		V_{GH}		+15.0	+17.0	+19.0	
		V_{EE}		-15.5	-15.0	-14.5	
		$V_{GL\ AC}$	AC Component of V_{GL}	–	+6.0	–	V_{P-P}
		$V_{GL\ DC}$	DC Component of V_{GL}	-13.0	-12.0	-10.5	V
Video Signal (V_R, V_G, V_B)		$V_{i\ AC}$	AC Component	–	+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}	–	TBD	–	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

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	200	350	–	–
Response Time	Rise	Tr	θ =0°	–	15	30	ms
	Fall	Tf	ϕ =0°	–	25	50	
Transmission	Ratio	T	–	8.5	9.0	9.5	%
Uniformity		U	–	65	70	–	–
Brightness		LUM	–	200	250	–	cd/m^2
White Chromaticity		X	θ =0°	–	TBD	–	–
		Y		–	TBD	–	
		Tc		–	TBD	–	
Lamp Life Time	+25°C	–	–	10,000	–	–	hr

Interface Pin Assignment

Pin No.	Symbol	Function	Input/Output	Remark
1	STH1	Start pulse for source driver	Input/Output	Note 1
2	AV_{SS}	Analog GND for source driver	Input	
3	AV_{DD}	Analog power input for source driver	Input	AV_{DD}= +5V (Typ..)
4	V_B	Video Input B	Input	
5	V_G	Video Input G	Input	V_{COM} =6V_{PP}
6	V_R	Video Input R	Input	
7	V_{SS}	Digital GND	Input	
8	V_{DD}	Digital power input	Input	V_{DD} =+3.3V (Typ..)
9	CPH1	Sampling and shift clock for source driver	Input	
10	CPH2	Sampling and shift clock for source driver	Input	
11	CPH3	Sampling and shift clock for source driver	Input	
12	STH2	Start pulse for source driver	Input/Output	Note 1
13	Q2H	Video input rotation control	Input	V_{COM} =6V_{PP}
14	INH	Output enable for source driver	Input	
15	R/L	Left/Right Control for source driver	Input	Note 1
16	V_{COM}	Common electrode voltage	Input	
17	V_{COM}	Common electrode voltage	Input	
18	XOE	Output enable for gate driver	Input	
19	CPV	Clock input for gate driver	Input	
20	U/D	Up/Down Control for gate driver	Input	
21	DIO2	Vertical start pulse	Input/Output	Note 2
22	DIO1	Vertical start pulse	Input/Output	
23	V_{GL}	Gate off voltage (alternative every 1-H)	Input	V_{COM} =6V_{PP}
24	V_{EE}	Gate driver negative voltage	Input	V_{EE} = -15V (Typ..)
25	V_{SS}	GND	Input	
26	V_{CC}	Logic power for gate driver	Input	V_{CC} =+3.3V (Typ..)
27	V_{GH}	Gate on voltage	Input	V_{GH} = +17V (Typ..)
28	NC	No connection	–	–

Note 1: STH1, STH2 and R/L mode

R/L	STH1	STH2	Remarks
High (VDD)	Input	Output	Left to Right
Low (0 Volt.)	Output	Input	Right to Left

Note 2: DIO1, DIO2 and U/D mode

U/D	DIO1	DIO2	Remarks
High (VDD)	Input	Output	Down to Up
Low (0 Volt.)	Output	Input	Up to Down

Dimensional Outline

VIEW "A"

DETAIL "A"

DETAIL "A"

DETAIL "B"

DETAIL "B"