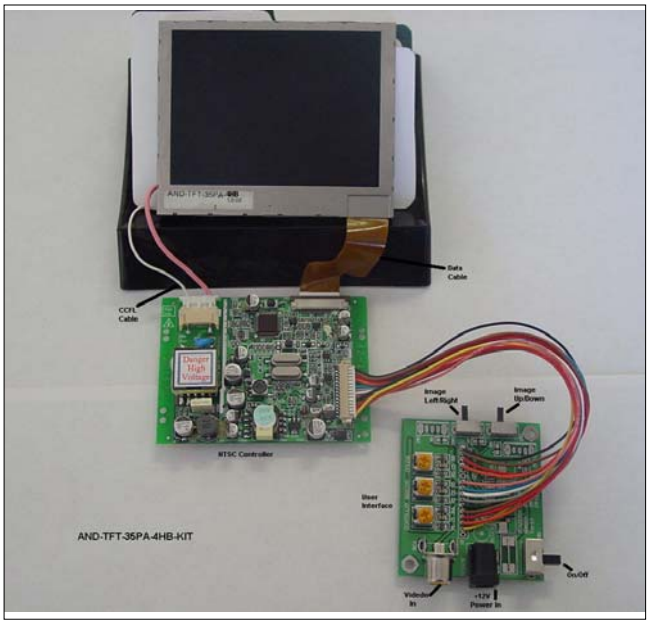


AND-TFT-35PA-4HB-KIT

3.5" TFT LCD
LCD Color Monitor

The AND-TFT-35PA-4HB-KIT 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 U-shape CCFL backlight. Sunlight readable, 1500 cd/m^2 brightness and anti-glare screen.

Part List:

- AND-TFT-35PA-4HB, Color Display
- PC-TFT-35PA, NTSC/PAL controller
- PC-Demo, User interface board
- 14 wire interface cable
- Built-in CCFL inverter
- AC/DC Power supply
- RoHS compliant

Mechanical Characteristics

Item	Specification	Unit
Screen Size	3.5 inch diagonal	inch
Outline Dimensions	83.7 (W) x 68.6 (H) x 9.0 (D)	mm
Active Area	72.0W)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	80	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.

Power Consumption

Item	Symbol	Remarks	Specifications			Units
			Min.	Typ.	Max.	
LCD Panel Power Consumption	–	–	–	33.5	–	mW
CCFL Current	I_L	–	–	5.0	–	mA
CCFL Starting Voltage	V_L	–	–	665.0	–	V
Backlight Power Consumption	P_L	–	–	2.4	–	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	± 60	–	deg
	Vertical	θ (to 12 o'clock)		10	45	–	
		θ (to 6 o'clock)		30	45	–	
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	1500	–	cd/m^2
White Chromaticity		X	θ =0°	0.280	0.310	0.340	–
		Y		0.310	0.340	0.370	
		Tc		66.50	68.50	70.50	
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	V_{COM} =6V_{PP}
5	V_G	Video Input G	Input	
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	–	–

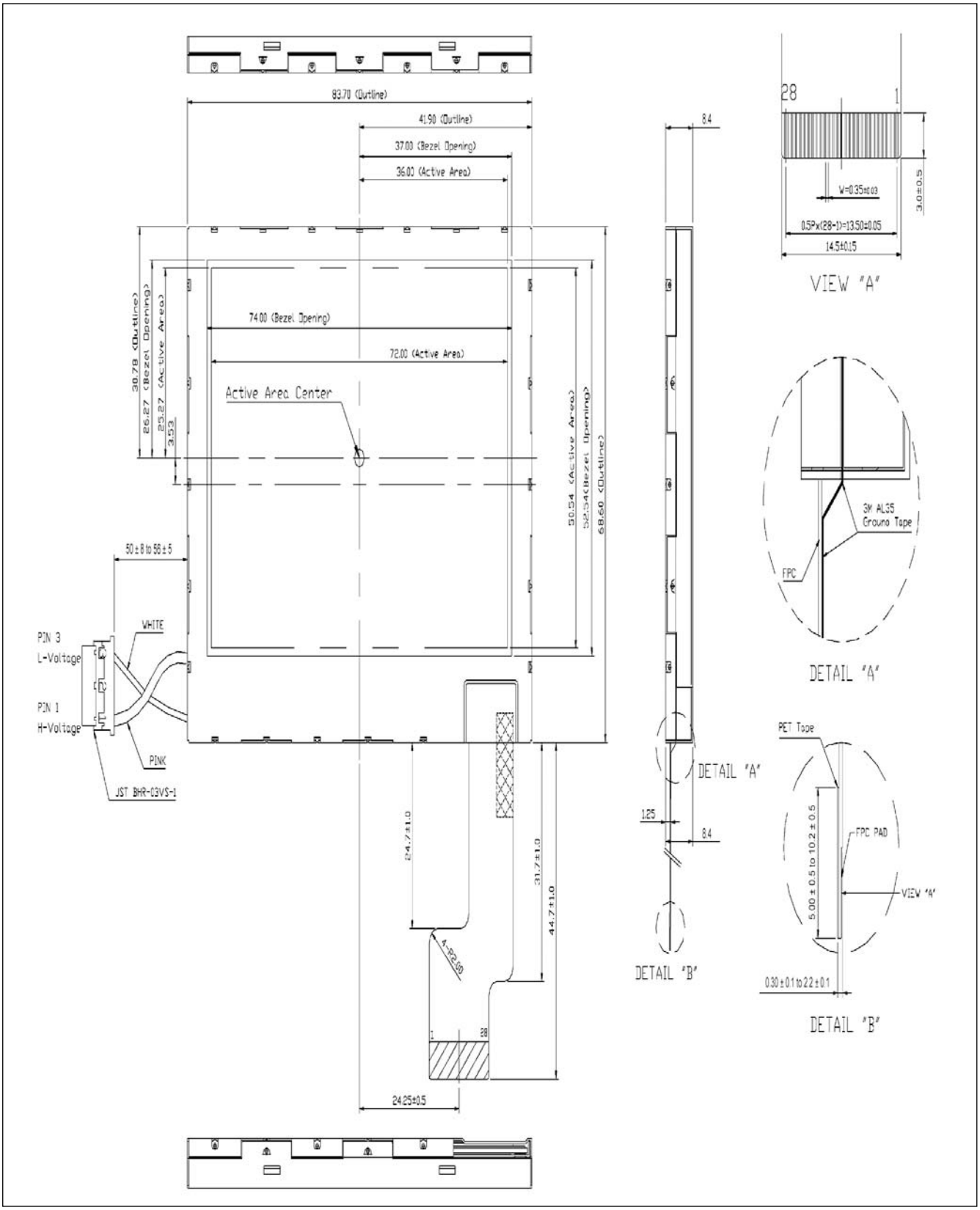
Note 1: STH1, STH2 and R/L mode

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



PC-TFT-35PA

Interface Board

Features

- Used for TFT-LCD display: 3.5” AND-TFT-35PA
- NTSC/PAL video input switch
- Requires only +12VD input
- DC/DC/DC/AC video decoder all-in-one
- Up/Down & Left/Right display reverse

The PC-TFT-35PA is designed to work with the AND-TFT-35PA color TFT display which is suitable for security, video game, door phone, video phone, portable TV and instrument display applications..

Mechanical Characteristics

Item	Specification	Unit
Screen Size	3.5 (diagonal)	inch
Display Format	480 x 234	dot
Active Area	71.6(H) x 52.65 (V)	mm
Dot Pitch	0.149 (W) x 0.225 (H)	mm
Pixel Configuration	Delta	–
Outline Dimension	87.3 (W) x 68.6 (H) x 6.6 (D)	mm
Weight	58	g
Contrast Ratio	150:1	–
View Angle	(V) +15° / -35°	deg
	(H) ± 50°	
Color	Full Color	–
Brightness	250	cd/m^2

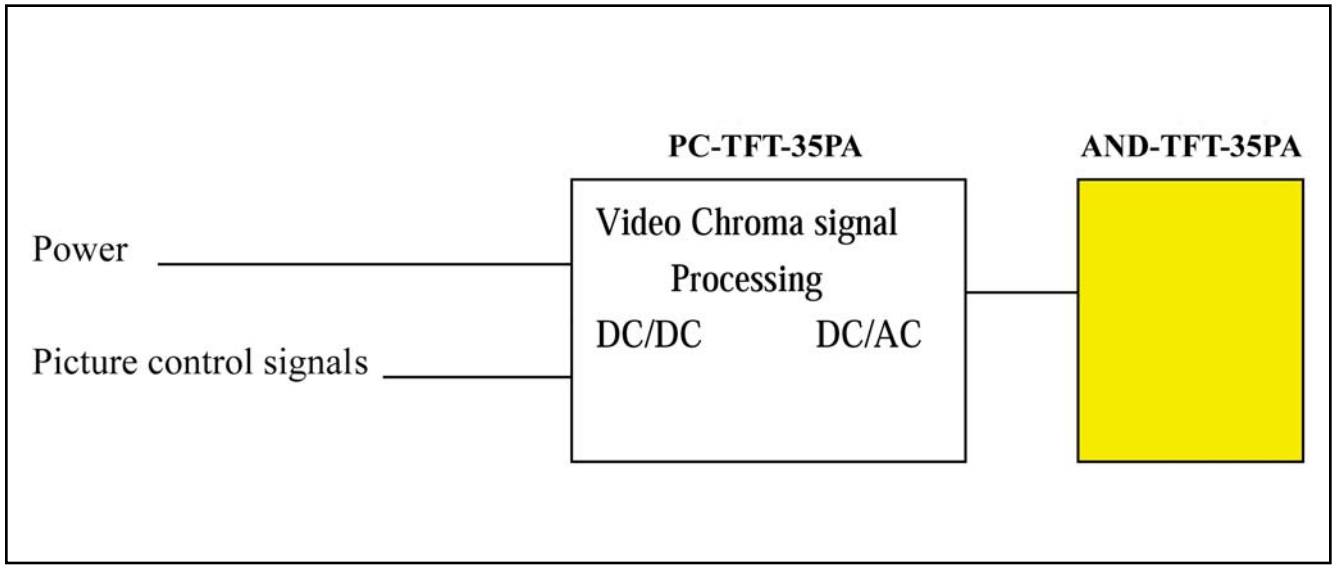
Absolute Maximum Rating

Item	Symbol	Conditions	Min.	Max.	Unit
Operating Temperature	Top	–	0	60	°C
Storage Temperature	Tstg	–	-30	80	°C

Electronic Characteristics

Symbol	Conditions	Input/Output	Min.	Typ.	Max.	Unit
Video	NTSC/PAL (75Ω)	Input	–	1	–	V
Vin	DC (+)	Input	10	12	14	V
Iin			–	220	–	mA
Pin	DC (+6V)		–	2.64	–	W
Vo	DC (+)	Output	–	5	–	V
Io			–	2	–	mA
Bright	DC (+)	Input	1.6	2.2	2.5	V
Contrast I	DC (+)	Input	1.6	1.8	2.5	V
Color	DC (+)	Input	0.6	1.4	1.8	V
Tint	DC (+) NTSC only	Input	1.4	1.9	2.4	V
NTSC/PAL	(Option)	Input	–	TTL	–	
Left/Right		Input	–	TTL	–	
Up/Down		Input	–	TTL	–	
–	Operating Temperature	–	0	–	60	°C

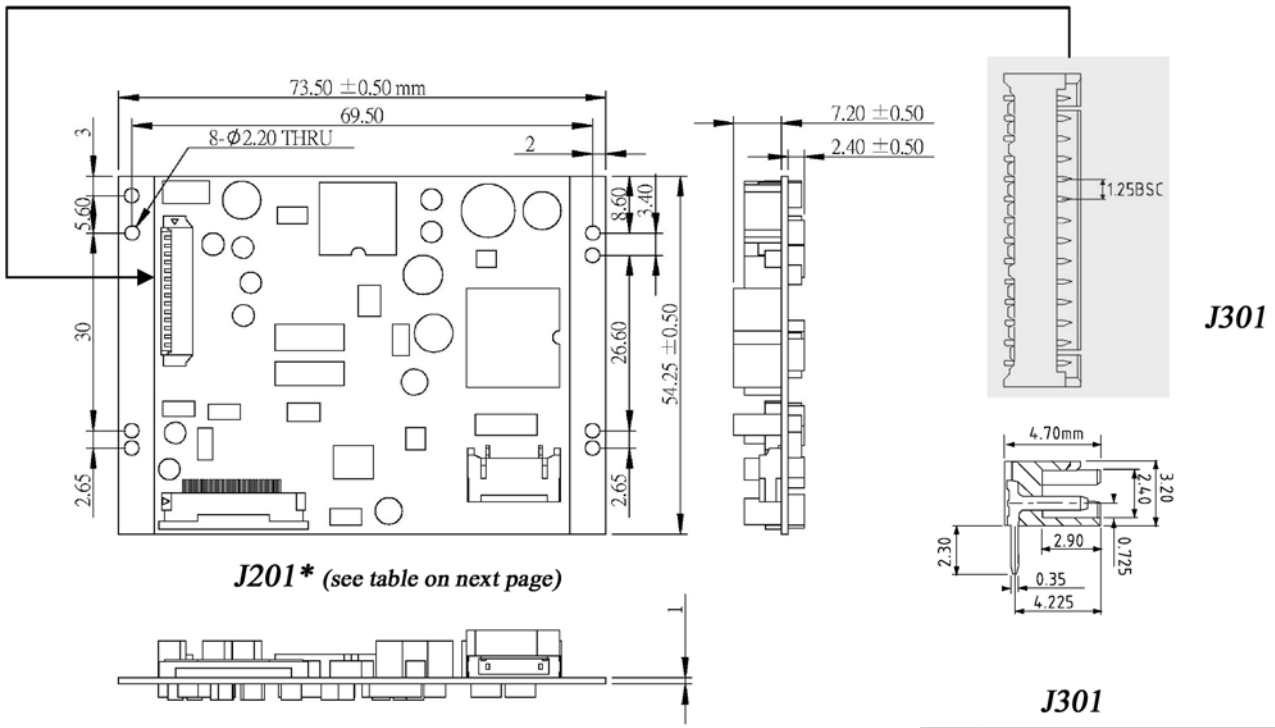
Block Diagram

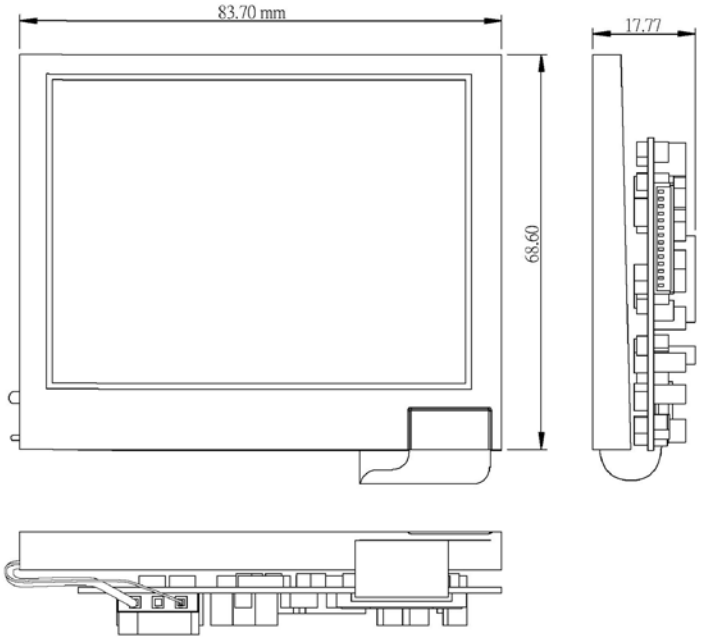


Dimensional Outline

NOTE: General tolerance is ± 0.50

Unit: mm





J301

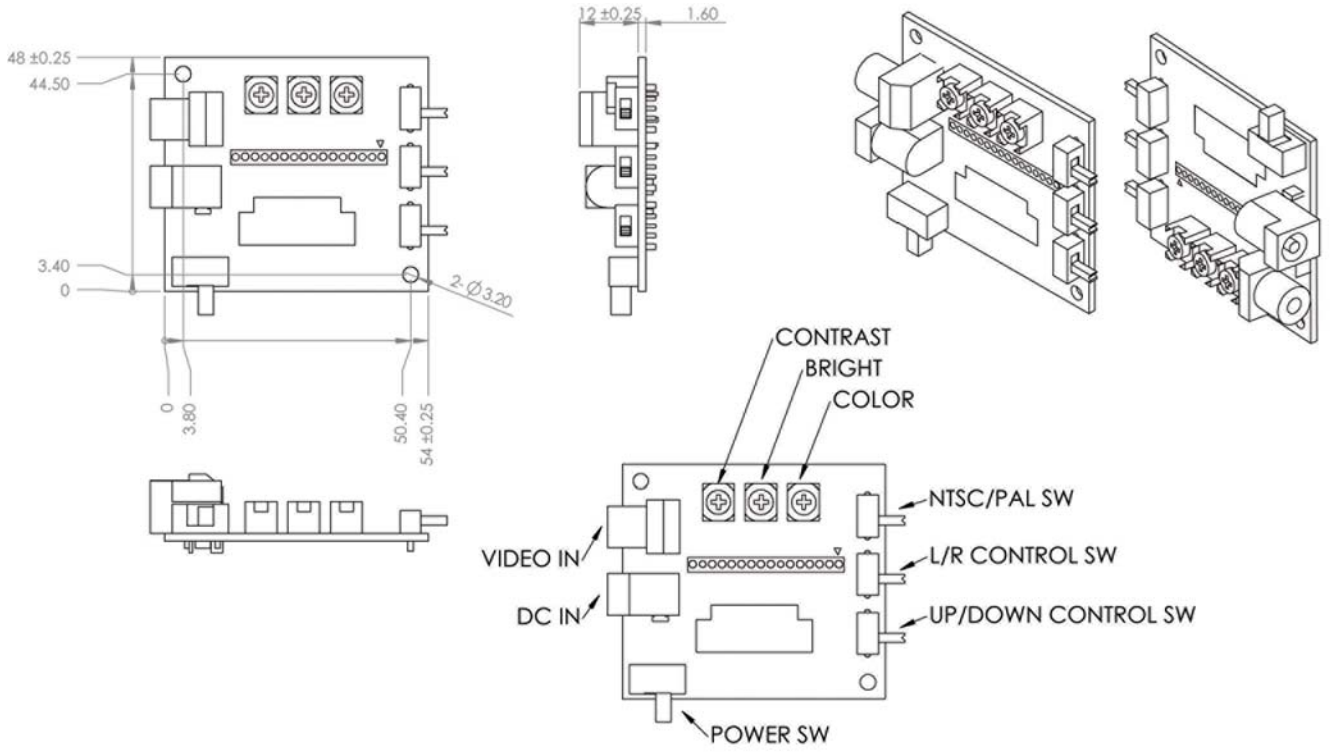
Pin	Symbol
1	Vin
2	GND(Power)
3	GND(Power)
4	GND(Video)
5	Video in
6	+5VA
7	Bright
8	Contrast
9	Color
10	Tint (NTSC only)
11	NTSC/PAL
12	Left / Right
13	Up / Down
14	GND(Board)

J201: LCD Panel I/O erminals (FPC 28-pin below contact type.)

Pin No.	Symbol	I/O	Description
1	STH1	I/O	Start pulse for source driver
2	AVSS	I	Analog GND for source driver
3	AVDD	I	Analog power input for source drive
4	VB	I	Video Input B
5	VG	I	Video Input G
6	VR	I	Video Input R
7	VSS	I	Digital GND
8	VDD	–	Digital power input
9	CPH1	I	Sampling and shift clock for source driver
10	CPH2	I	Sampling and shift clock for source driver
11	CPH3	I	Sampling and shift clock for source driver
12	STH2	I/O	Start pulse for source driver
13	Q2H	I	Video input rotation control
14	INH	I	Output enable for source driver
15	R/L	I	Left/Right Control for source driver
16	VCOM	I	Common electrode voltage
17	VCOM	I	Common electrode voltage
18	XOE	I	Output enable for gate driver
19	CPV	I	Clock input for gate driver
20	U/D	I	Up/Down Control for gate driver
21	DIO2	I/O	Vertical start pulse
22	DIO1	I/O	Vertical start pulse
23	VGL	I	Gate off voltage (alternative every 1-H)
24	VEE	I	Gate driver negative voltage
25	VSS	–	GND
26	Vcc	I	Logic power for gate driver
27	VGH	I	Gate on voltage
28	NC	–	No connection

Note: About TFT-LCD Panel detail information please refer to AND's AND-TFT-35PA specification.

PC-DEMO-USER INTERFACE BOARD



2.5" 3.5" demo Board