AND Displays

ANDpSi035STEB1-LED-KIT
3.5" Color p-Si TFT
LCD Module (Transflective)

The ANDpSi035STEB1-LED_KIT is 320 x 240 Color TFT display that utilizes new poly-silicon (p-Si) technology to provide brighter, thinner and lighter display with high resolution. The p-Si TFT technology allows the row and column LCD drivers to be fabricated directly on LCD glass. This eliminates the need for discrete TAB. Higher aperture ratio makes the display even brighter. Six white bright LED front light and touch screen integrated. All these features making it ideal for portable applications including personal digital assistants (PDAs), medical instruments and test & measurements instruments.

Features

- p-Si construction with drivers on glass
- High luminance
- 6 White LED front light
- 6-bit (261K) colors
- Slim (4.9mm MAX) and lightweight design
- 3.5" display (8.89mm)
- 4 wire touch screen integrated
- Applications: portable, battery-operated applications

Mechanical Characteristics

Item	Specification	Unit
Display Size (diag.)	3.5 (8.9cm)	inch
Display Type	Transflective	–
Active Area	53.64 (H) x 71.52 (V)	mm
Number of Dots	240 (H) x RGB x 320 (V)	dot
Dot Pitch	0.0745 (H) x 0.2235 (V)	mm
Color Arrangement	RGB Stripe	–
Color Numbers	262,144 (6 bits)	–
Outline Dimensions	64(H) x 85(V) x 4.05 max(D)	mm
Weight	42 (Approx.)	g
Power Consumption	LCD Panel + T-CON +L/S	50 (Typ.)	mW
	Backlight	432 @ 20mA	mW

Absolute Maximum Ratings (GND=0V)

Item	Symbol	Min.	Max.	Unit
Logic Supply Voltage	VCC3	-0.3	4	V
	VCC5	-0.3	6	V
Power Supply for H/V Driver	VDD	-1.0	+14	V
	VEE	-7.5	-5.0	V
Data Input Voltage	R[5:0], G[5:0], B[5:0], CLK, DE	-0.3	VCC3 +0.3	V
Touch Panel Operation Voltage	V_{TOUCH}	–	5.5	V

Absolute Maximum Ratings (Cont.) (GND=0V)

Item	Symbol	Min.	Max.	Unit
Backlight LED forward Voltage	V_F	–	30	V
Backlight LED reverse Voltage	V_R	–	5	V
Backlight LED frwd current (Ta=25ºC)	I_F	–	30	mA
Operating Temp.	Topr	-10	+55	ºC
Storage Temp.	Tstg	-20	+70	ºC

Electrical Characteristics (Ta = 25°C)
Driving TFT LCD Panel

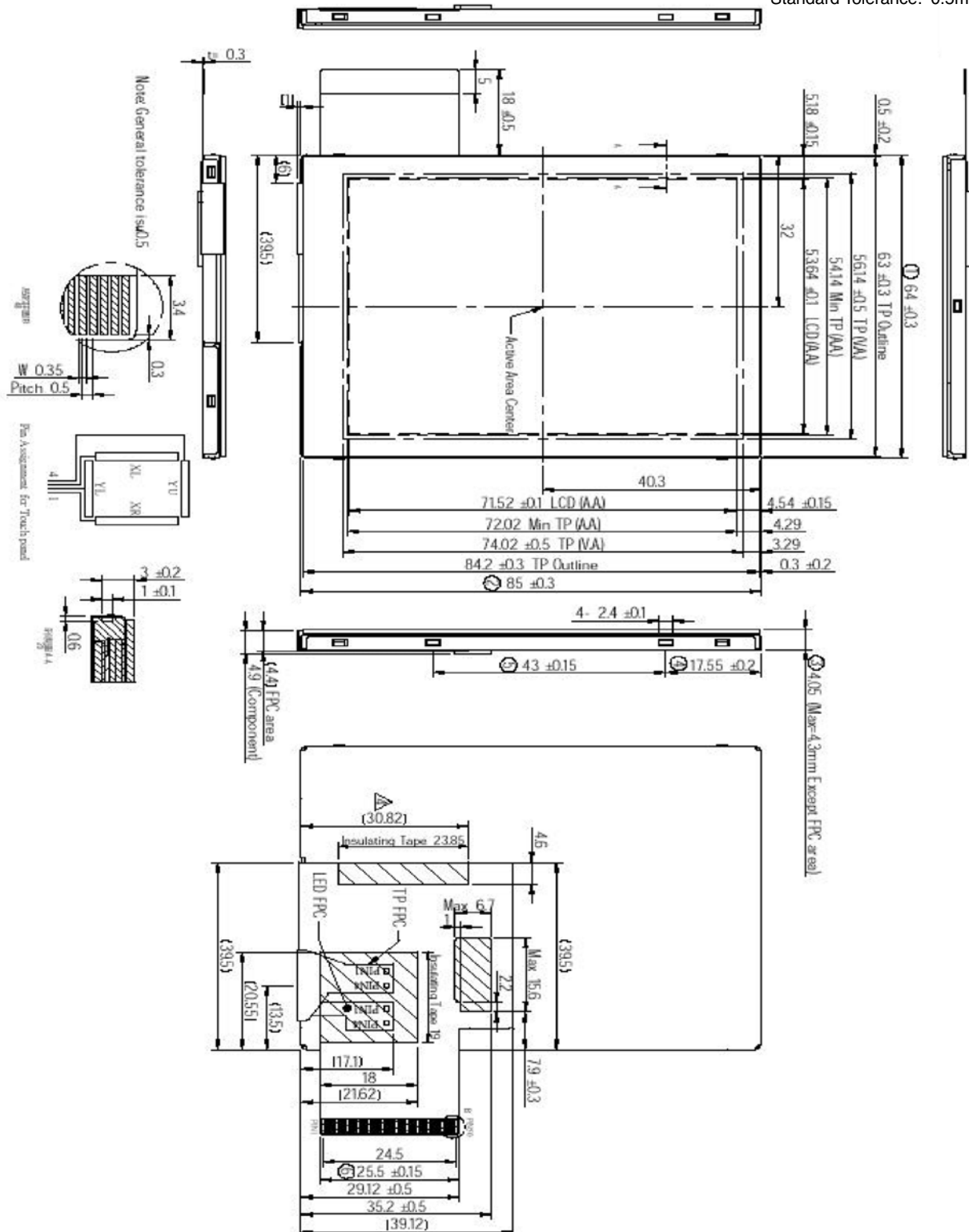| Item	Symbol	Min.	Typ.	Max.	Unit
Logic Supply Voltage	VCC3	3.0	3.3	3.6	V
	VCC5	4.5	5.0	5.5	V
Power Supply for H/V Driver	VDD	11.1	11.7	12.3	V
	VEE	-7	-6.5	-6	V
Data Input Voltage R[5:0], G[5:0], B[5:0], CLK, DE — High	VIH	2.4	–	3.3	V
Low	VIL	0	–	0.8	
VCC3 Supply Current*	I_{VCC3}	1.7	1.9	3	mA
VCC5 Supply Current*	I_{VCC5}	5	5.5	6.5	mA
VDD Supply Current*	I_{VDD}	0.9	1.0	2	mA
VEE Supply Current*	I_{VEE}	8	10	20	uA

*Note: The typical supply current specification is measured at the line inversion test pattern (black and white interlacing horizontal lines.)

Driving Backlight (Ta = 25°C)

Item	Symbol	Min.	Typ.	Max.	Unit
Forward Current LED/Part	I_F	–	20	30	mA
Forward Current Volt. I_F: 20mA LED/Part	V_F	–	3.6	3.9	V

Note: Backlight driving circuit is recommened as the fix current circuit.

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Dimensional Outline

Front View

Unit: mm
Standard Tolerance: 0.5mm

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Timing Chart (Display Timing)

Item	Symbol	Min	Typ	Max	Unit
Vertical Display Active	t_{Vdisp}	320	320	320	ns
Vertical Blank Time	t_{Vblank}	7	13	22	ns
Horizontal Display Active	t_{Hdisp}	240	240	240	ns
Horizontal Blank Time	t_{Hblank}	79	80	100	ns
DE Inactive to CLK Rising Edge	t_{dei}	6	10	15	ns
DE Active to CLK Rising Edge	t_{dea}	6	10	15	ns
Clock Frequency	t_{clk}	6.2	6.4	7.1	MHz
Clock Period	t_{clk}	161	156.25	140.8	ns
Data Setup Time	t_{dsu}	5	10	15	ns
Data Hold time	t_{dhd}	10	15	20	ns

Timing Chart
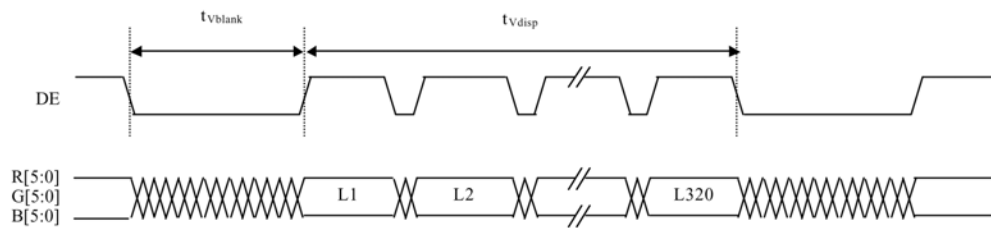
Vertical Timing

Horizontal Timing

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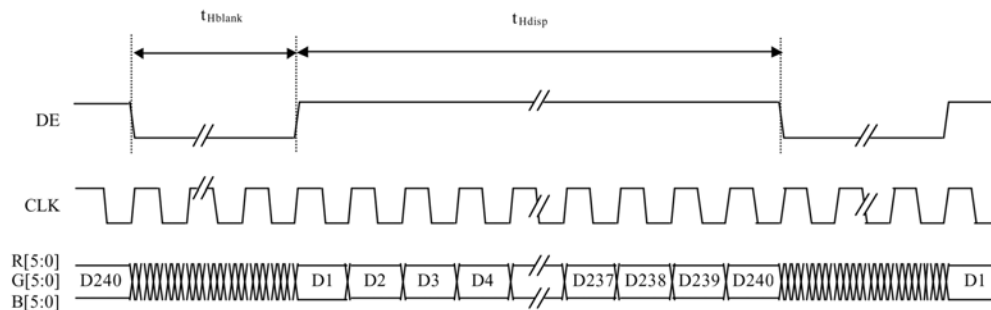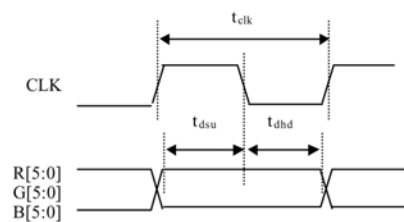
Input/Output Terminals
Recommended Connector for Module: HRS FH12-50S-0.5SH(CL586-0529-2)

Pin	Symbol	I/O	Description	Pin	Symbol	I/O	Description
1	VDD	–	Supply voltage for H/V driver (+12V)	26	B5	I	Video data blue 5 (MSB)
2	DE	I	Data Enable	27	NC	–	No connection (leave this pin open)
3	NC	–	No connection (leave this pin open)	28	NC	–	No connection (leave this pin open)
4	NC	–	No connection (leave this pin open)	29	NC	–	No connection (leave this pin open)
5	GND	–	Ground	30	CLK	I	Video data clock
6	VEE	–	Supply voltage for V driver (-6.5V)	31	NC	–	No connection (leave this pin open)
7	GND	–	Ground	32	NC	–	No connection (leave this pin open)
8	NC	–	No connection (leave this pin open)	33	VCC5	–	Supply voltage for 5V logic
9	R0	I	Video data red 0 (LSB)	34	VCC5	–	Supply voltage for 5V logic
10	R1	I	Video data red 1	35	NC	–	No connection (leave this pin open)
11	R2	I	Video data red 2	36	NC	–	No connection (leave this pin open)
12	R3	I	Video data red 3	37	VCC3	–	Supply voltage for 3.3V logic
13	R4	I	Video data red 4	38	VCC3	–	Supply voltage for 3.3V logic
14	R5	I	Video data red 5 (MSB)	39	NC	–	No connection (leave this pin open)
15	G0	I	Video data green 0 (LSB)	40	NC	–	No connection (leave this pin open)
16	G1	I	Video data green 1	41	GND	–	Ground
17	G2	I	Video data green 2	42	Anode R	–	LED Power Supply (+)
18	G3	I	Video data green 3	43	Cathode R	–	LED Power Supply (-)
19	G4	I	Video data green 4	44	Anode L	–	LED Power Supply (+)
20	G5	I	Video data green 5 (MSB)	45	Cathode L	–	LED Power Supply (-)
21	B0	I	Video data blue 0 (LSB)	46	GND	–	Ground
22	B1	I	Video data blue 1	47	XR	–	Touch Panel Right Side Pin
23	B2	I	Video data blue 2	48	YL	–	Touch Panel Lower Side Pin
24	B3	I	Video data blue 3	49	XL	–	Touch Panel Left Side Pin
25	B4	I	Video data blue 4	50	YU	–	Touch Panel Upper Side Pin

Touch panel Pin

Touch Panel Pin	Module Pin	Symbol	Description
1	47	XR	Touch Panel Right Side
2	48	YL	Touch Panel Lower Side
3	49	XL	Touch Panel Left Side
4	50	YU	Touch Panel Upper Side
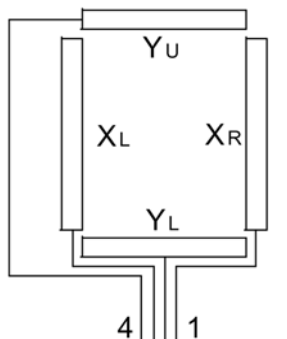
Pin Assignment for Touch Panel

Block Diagram
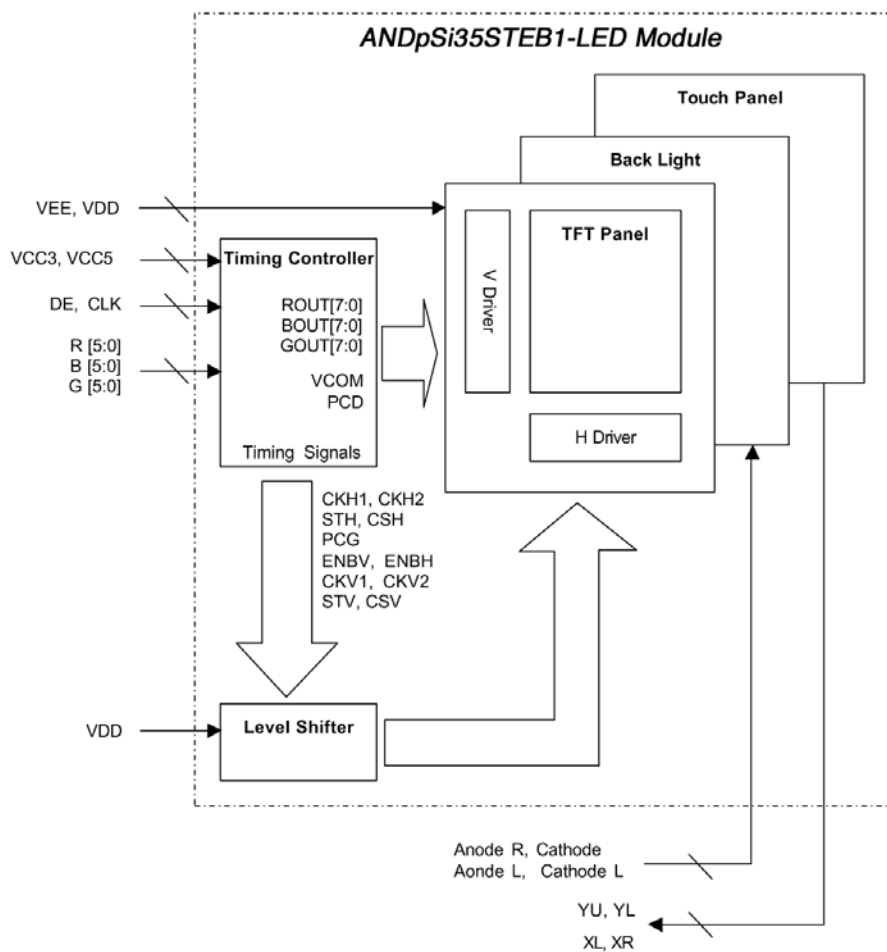
Driving Touch Panel (Analog Resistance Type)   Ta=25ºC

Item	Symbol	Min.	Typ.	Max.	Unit
Resistor between terminals (XR-XL)	Rx	250	–	1100	Ω
Resistor between terminals (YU-YL)	Ry	200	–	700	Ω
Operation Voltage (DC)	V_{Touch}	–	5	–	V
Line Lineartiy (X direction)	–	-1.5	–	+1.5	%
Line Linearity (Y direction)	–	-1.5	–	+1.5	%
Chattering	–	–	–	10	ms
Minimum tension for detecting	–	–	–	80	g
Insulation Resistance (At DC 25V)	RI	20	–	–	MΩ

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Optical Specification - Backlight Off/w Touch Panel   Ta=25ºC

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing Angles	T11	CR = 2	40	50	–	degree
	T12		40	50	–	
	T21		45	55	–	
	T22		45	55	–	
Contrast Ratio	CR	$\Theta = 10º$	7:1	10:1	–	–
Reflectivity	R	$\Theta = 10º$	10	15	–	%

Optical Specification - Backlight On /w Touch Panel   Ta=25ºC

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing Angle	T11	CR = 2	45	60	–	degree
	T12		35	45	–	
	T21		35	45	–	
	T22		45	60	–	
Response Time	Tr	$\Theta = 0º$	–	10	17	ms
	Tf	$\Theta = 0º$	–	15	23	ms
Contrast Ratio	CR	$\Theta = 0º$	55:1	80:1	–	–
Luminance	L	$\Theta = 0º$ $I_F=20mA$	80	100	–	cd/m^2
NTSC	–	–	32	39	–	%
Uniformity	–	–	70	80	–	%
Chromaticity	x	$\Theta = 0º$	0.26	0.31	0.36	–
	y		0.28	0.33	0.38	

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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