AND Displays

ANDpSi018TP-LED
1.8" Active color TFT LCD Module with Analog Interface

The ANDpSi018TP-LED is an 558 x 234 active matrix color TFT LCD Module with Analog Interface that utilizes new low temperature 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. NTSC and PAL formats are compatible. Scan can be from left to right, right to left, up to down, or down to up. 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
- Analog Interface
- NTSC and PAL format compatible
- 16 Million/Full Color
- Slim (2.85mm) and lightweight design
- 1.8" display (4.6mm)
- White LED Backlight
- Applications: portable, battery-operated applications

Mechanical Characteristics

Item		Specification	Unit
Display Size (diag.)		1.8 (4.6cm)	inch
Display Type		Transmissive	–
Active Area		36.52 (H) x 27.38 (V)	mm
Number of Dots		558 (H) x RGB x 234 (V)	dot
Dot Pitch		0.0655 (H) x 0.117 (V)	mm
Color Arrangement		RGB Delta	–
Color Numbers		16 Million/Full Color	–
Outline Dimensions		43.8(H) x 38.35(V) x 2.85 (D)	mm
Weight		9	g
Power Consumption	LCD Panel	21 (Typ.)	mW
	Backlight	157.5 @ 15mA	mW

Absolute Maximum Ratings (GND=0V)

Item	Symbol	Min.	Max.	Unit
Power Supply for H/V Driver	HVDD	-1.0	+14	V
	VVDD	-1.0	+14	V
Vertical Driver Neg PS	VVEE	-6.0	-1.0	V
Common Electrode	VCOM	-1.0	+14	V
Precharge Data Input H/V Driver	(X)STH, CKH1(2), CSH, (X)PCG	-1.0	+14	V
	(X)STV, CKV1(2), CSV, (X)ENB	-1.0	+14	V
Precharge Data Input Video	VG, VR, VB, VPCD	+1.0	+13	V
Backlight Forward current	I_F	–	25	mA
Operating Temp.	Topr	-10	+60	ºC
Storage Temp.	Tstg	-30	+80	ºC

Driving Backlight in Standard Mode (Ta = 25°C)

Item	Symbol	Min.	Typ.	Max.	Unit
Forward Current	I_F	–	15	25	mA
Forward Current Volt.	V_{F15}	–	10.5	–	V
Backlight Power Cons*	W_{BL15}	–	157.5	25	mW

* Backlight driving circuit is recommended as the fix current circuit

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.

2/15/06

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Dimensional Outline

Unit: mm
Standard Tolerance: 0.5mm

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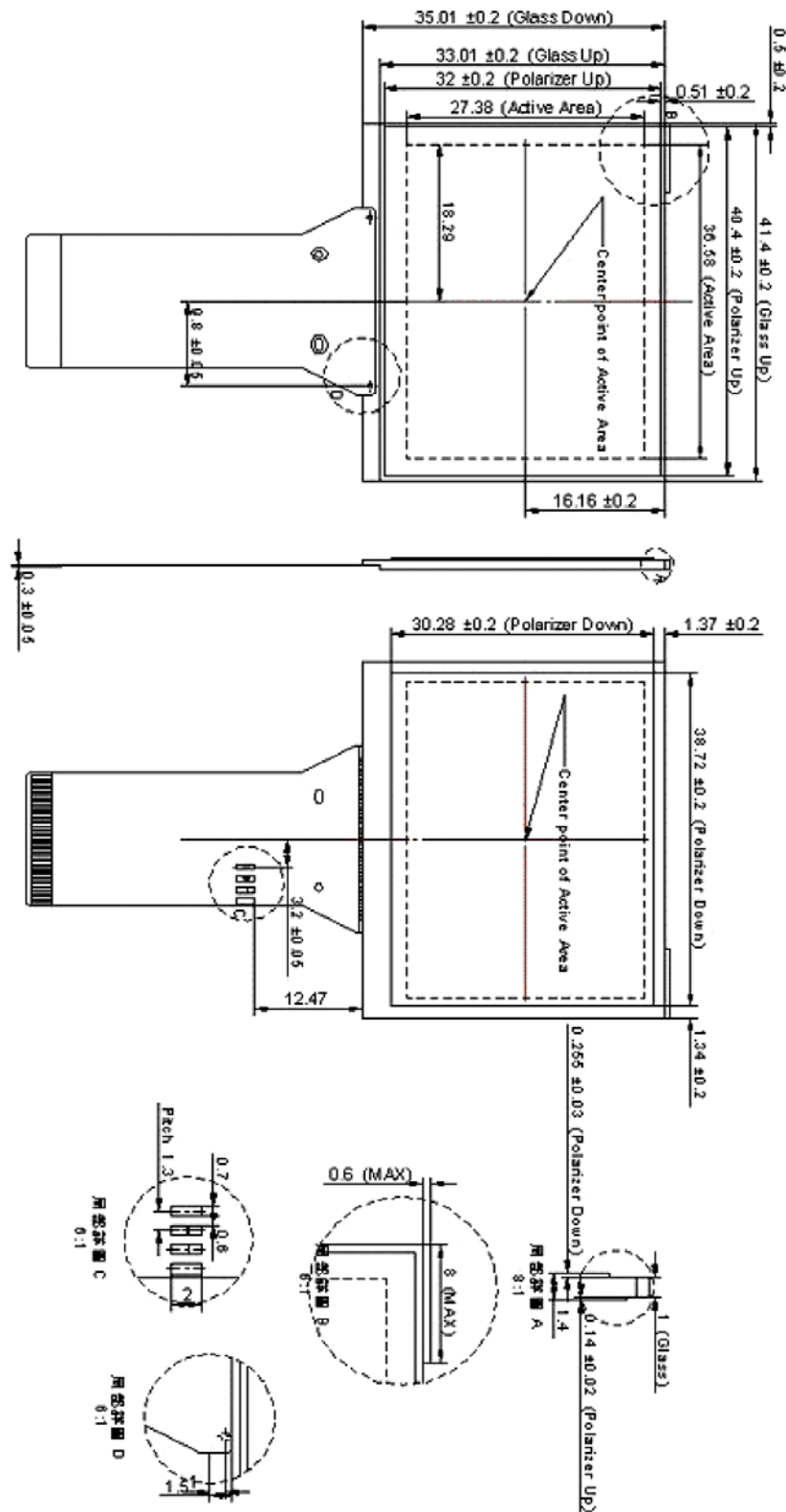
Timing Chart With Analog Interface

	NTSC Cycle (fh)	PAL Cycle (fh)	1 (fh)	2 (fh)	3 (fh)	4 (fh)	5 (fh)	6 (fh)	7 (fh)	8 (fh)	9 (fh)	10 (fh)	11 (fh)
Odd Line	622 (t=102.2ns)	636 (t=100.6ns)	82.5	12	6	69	9.5	25	19.5	31.5	76.5	50	32.5
Even Line	622 (t=102.2ns)	636 (t=100.6ns)	81	12	6	69	8	25	18	30	75	50	32.5

Horizontal Odd/Even Line
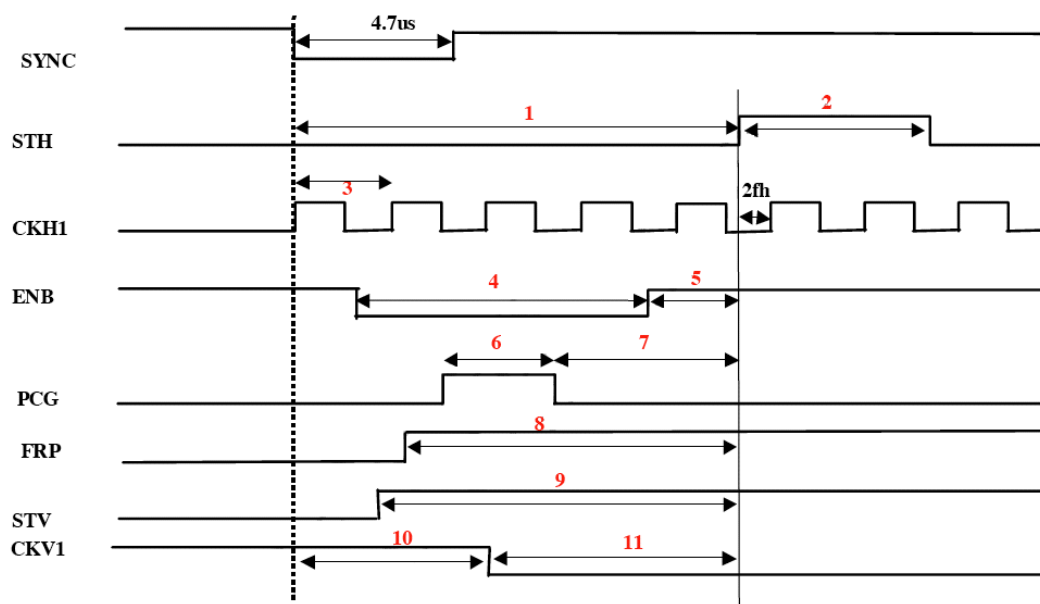
Vertical Display Area
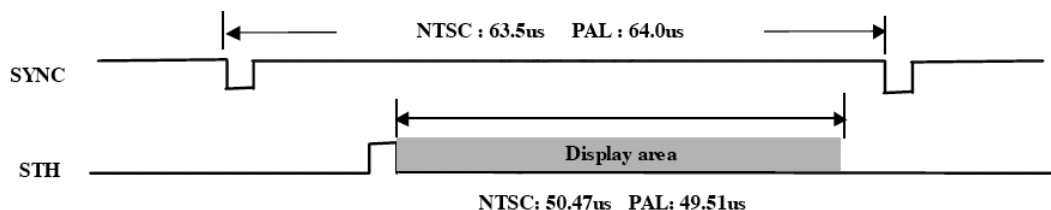
Vertical Start Position

	Odd Field	Even Field
NTSC	16	15
PAL	23	22
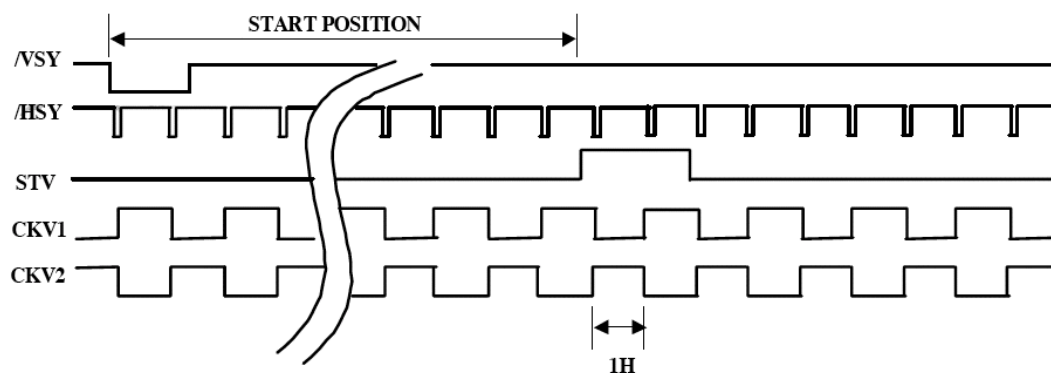
Input/Output Terminals
TFT LCD Panel

Pin	Symbol	Input/Output	Description
1	NC	–	No connection
2	V_{FS}	I	GND for LED Backlight
3	V_F	I	LED Input Voltage
4	NC	–	No connection
5	NC	–	No connection
6	NC	–	No connection
7	VCOM	I	Common Electrode Voltage
8	CKV1	I	Vertical Clock 1
9	CKV2	I	Vertical Clock 2
10	STV	I	Vertical Start Signal
11	XSTV	I	Inverted Signal for STV
12	VVDD	I	Power Supply for Vertical Driver
13	ENB	I	Enable Signal
14	XENB	I	Inverted Signal of ENB
15	CSV	I	UP/DOWN Inverse Control Signal
16	VBB	O	Vertical Driver Output Power Voltage
	NC	–	No connection
17	PCG	I	Precharge Data Signal
18	XPCG	I	Inverted Signal of PCG
19	PCD	I	Precharge Data Signal For Pixel
20	B	I	Video Signal (B)
21	R	I	Video Signal (R)
22	G	I	Video Signal (G)
23	CSH	I	RIGHT/LEFT Inverse Control Signal
24	VVEE	I	Vertical Driver Negative Power Supply Voltage
	VSS	I	GND
25	VSS	I	GND
26	STH	I	Horizontal Start Signal
27	XSTH	I	Inverse Signal of STH
28	HVDD	I	Power Supply For Horizontal Driver
29	CKH1	I	Horizontal Clock 1
30	CKH2	I	Horizontal Clock 2

Driving TFT LCD Panel with Analog Interface

Item		Symbol	MIN	TYP	MAX	Unit	Remarks
Power Supply for Vertical Driver		VVDD	11.5	12	12.5	V	
Power Supply for Horizontal Driver		HVDD	11.5	12	12.5	V	
Horizontal Driver Input Voltage	Low	VHIL	-0.3	0.0	0.3	V	
	High	VHIH	2.5	3.0	4.0	V	
Vertical Driver Input Voltage	Low	VHIL	-0.3	0.0	0.3	V	
	High	VHIH	2.5	3.0	4.0	V	
CSH, CSV	Low	VHIL	-0.3	0.0	0.3	V	
	High	VHIH	11.5	12	12.5	V	
Video Signal Center Votage [1]		VVC	5.0	5.2	5.4	V	Note 1
Video Input Votage Range		VG, VR, VB	VCC-3.5	–	VCC+3.5	V	
Common Electrode Voltage [2]		VCOM	–	VCC-0.2	–	V	Note 2
Panel Power Consumption		W_P	–	43	–	mW	

Notes:
1. Video Signal and precharge data signal shall be input smmetrically around VVC
2. Set common electrode to the optimum voltage

Block Diagram: Driving TFT LCD Panel with Analog Interface

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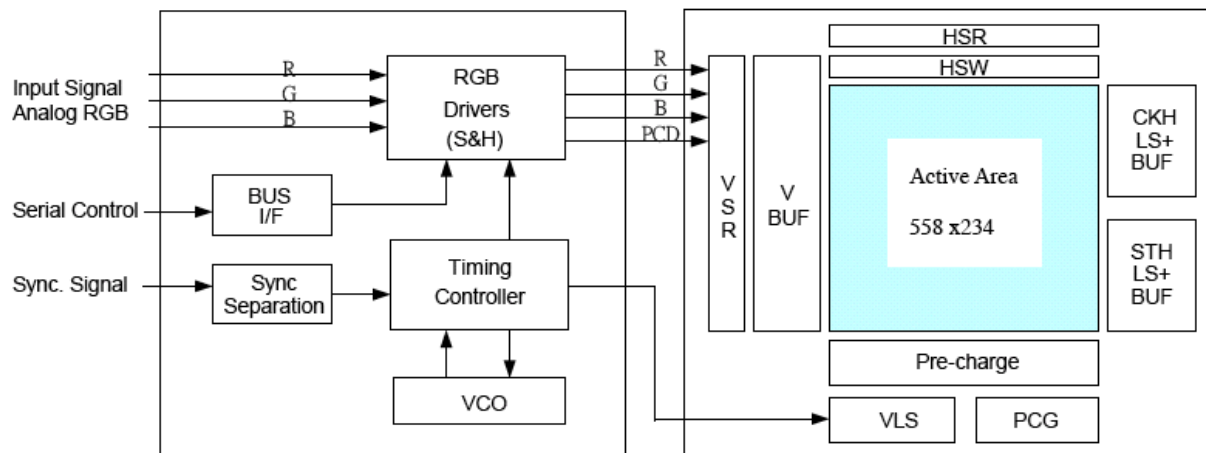
Driving Backlight in High Luminance Mode (Ta = 25°C) (Cont.)
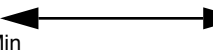
Item	Symbol	Min.	Typ.	Max.	Unit
Forward Current	I_F	–	20	25	mA
Forward Current Voltage	V_{F20}	–	10.8	–	V
Backlight LED Life	BL	–	10,000	–	Hr
Backlight Power Consumption	W_{BL20}	–	216	–	mW

* Backlight driving circuit is recommended as the fix current circuit

Optical Specification   Ta=25°C

Item		Symbol	Condition	Min.	Typ.	Max.	Unit
Viewing Angle		θ11	CR ≥ 10	35	45	–	degree
		θ12		35	45	–	
		θ21		12	17	–	
		θ22		35	45	–	
Contrast Ratio		CR	θ = 0°	120	200	–	–
Response Time	Rising	Tr	–	–	15	25	ms
	Falling	Tf		–	25	45	
Luminance	I_F=15mA	L_{15}	θ = 0°	200	250	–	cd/m^2
NTSC	I_F=20mA	L_{20}	θ = 0°	250	300	–	
Chromaticity	White	x_w	θ = 0°	0.26	0.31	0.36	–
		y_w	θ = 0°	0.29	0.34	0.39	

Reliability

No	Test Item	Condition
1	High Temperature Operation	Ta = +60°C, 240hrs
2	High Temperature & High Humidity Operation	Ta = +40°C, 95% RH, 240hrs
3	Low Temperature Operation	Ta = -10°C, 240hrs
4	High Temperature Storage (non-operation)	Ta = +80°C, 240hrs
5	Low Temperature Storage (non-operation)	Ta = -30°C, 240hrs
6	Thermal Shock (non-operation)	-30°C ◄——► 80°C, 50 cycles 30 Min 30 Min
7	Resistance to Static Electricity Discharge (non-operation)	C = 200pF, R = 0Ω; Discharge: ±150V 3 Times / Terminal
8	Surface Discharge (non-operation)	C = 150pF, R = 330Ω; Discharge: Air: ±15kV; Contact: ±8kV 5 Times / Point; 5 Points / Panel
9	Vibration (non-operation)	Frequency: 10-55Hz; Amplitude: 1.5mm Sweep Time: 11min Test Time: 2hrs for each direction of X, Y, Z
10	Shock (non-operation)	Acceleration: 100G; Period: 6ms Directions: ±X, ±Y, ±Z; Cycles: Twice

Ta: Ambient Temperature

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