



AND-TFT-18DM

160 x 234 Pixels LCD Color Monitor

The AND-TFT-18DM is a compact full color TFT LCD module, that is suitable for applications such as a portable television (NTSC) and a display for monitors. This device consists of a twisted nematic (TN) liquid crystal cell, that incorporates a TFT-array that has 160 x 234 pixels on a 1.8 inch diagonal screen, X and Y drivers, an LSI controller, and a built-in CCFL backlight.

Features

- Compatible with NTSC
- High Resolution: 112,320 dots
- Low Power
- High Brightness
- Requires external chroma decoder

Mechanical Characteristics

Item	Specification	Unit
Screen Size	1.8 inch (4.6 cm) diagonal	inch
Outline Dimensions	46.5 (W) x 42.5 (H) x 18.0 (D)	mm
Active Area	36.5 x 27.4	mm
Input Signal	NTSC	
Pixel Number (RGB trio)	160 (W) x 234 (H)	–
Sub Pixel No.	480 (W) x 234 (H)	–
Sub Pixel Arrangement	Delta	–
Dot Pitch	0.076 (W) x 0.114 (H)	mm
Weight	28	g

Absolute Maximum Rating

Item		Symbol	Conditions	Absolute Maximum Rating		Unit
				Min.	Max.	
Supply Voltage	for Source Driver	DV_{EE}	$T_a = 25^{\circ}\text{C}$	0	+16.0	V
	for Gate Driver	H Level V_{CC}	$T_a = 25^{\circ}\text{C}$	-0.3	+26.5	V
		L Level V_{BBB}	$T_a = 25^{\circ}\text{C}$	-7	+20.0	V
	for Controller	V_{DD}	$T_a = 25^{\circ}\text{C}$	0	+6.5	V
DC Bias Voltage for Common Electrode		V_{com}	$T_a = 25^{\circ}\text{C}$,	+2	+6.0	V
Analog Input Signals		V_B, V_R, V_G		–	+12.0	V
Operating Temperature		T_{op}	–	-10	+60	$^{\circ}\text{C}$
Storage Temperature		T_{stg}	–	-30	+80	$^{\circ}\text{C}$
Humidity (No condensation of water)		–	60°C	–	95%	RH

Electrical Specification

Item		Symbol	Conditions	Specifications			Units
				Min.	Typ.	Max.	
Current Consumption	for Video Circuit	ICC		–	0.17	–	W
	for Backlight	IBL		–	0.66	–	W
Supply Voltage		VDD		4.7	5.0	5.3	V

($T_a = \text{RT}$, $V_{SS} = 0\text{V}$)



Recommended Operating Conditions

Item			Symbol	Conditions	Specifications			Unit
					Min.	Typ.	Max.	
Supply Voltage	for Source Driver		DV_{EE}	$T_a = 25^{\circ}\text{C}$	+13.5	+14.0	+14.5	V
	for Gate Driver	H Level	V_{CC}	$T_a = 25^{\circ}\text{C}$	+19.0	+20.0	+24.0	V
		L Level	V_{BBB}	$T_a = 25^{\circ}\text{C}$	-5.5	-5.0	-4.0	
	for Controller		V_{DD}	$T_a = 25^{\circ}\text{C}$	+ 4.7	+5.0	+5.3	V
Analog Input Voltage	Amplitude		V_{DD}	$T_a = 25^{\circ}\text{C}$	+1.1	–	+12.0	V
	DC Component		V_{RGB}	$T_a = 25^{\circ}\text{C}$	+4.0	+6.0	+8.0	

Optical Specifications

Item		Symbol	Conditions	Specifications			Unit
				Min.	Typ.	Max.	
Luminance		LUM		200	230	–	cd/m ²
Contrast Ratio		CR	<u>Luminance when LCD is White</u> Luminance when LCD is Black	130	160	–	–
Reflectance		R		–	2.0	–	%
Viewing Angle	Horizontal	φ	CR>10	45	55	–	deg
	Vertical	φ (to 12 o'clock)		-10	-15	–	deg
		φ (to 6 o'clock)		30	35	–	deg
Lamp Life		Time		10,000	–	–	hr.

Power Consumption

Parameter	Conditions	Typ.	Unit	Parameter	Conditions	Typ.	Unit
Current for V_{CC}	$V_{CC} = +20\text{V}$	1.4	mA	Current for OV_{SS}	$OV_{SS} = +14\text{V}$	4.0	mA
Current for V_{BBA}	$V_{BBA} = -5\text{V}$	1.0	mA	Current for PV_{DD}	$PV_{DD} = +5\text{V}$	0.2	mA
Current for V_{BBB}	$V_{BBB} = -5\text{V}$	0.1	mA	Current for V_{DD}	$V_{DD} = +5\text{V}$	4.8	mA
Current for V_{BBC}	$V_{BBC} = -5\text{V}$	0.1	mA	LCD Panel Power Consumption		0.2	W
Current for DV_{EE}	$DV_{EE} = +14\text{V}$	0.5	mA	Backlight Power Consumption		0.7	W
Current for AV_{EE}	$AV_{EE} = +14\text{V}$	3.2	mA	Total Power Consumption		0.9	W

Input/Output Timing

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Horizontal Sync Output Pulse	Width	T_{HO}	4.2	4.7	5.2	μs
	Phase Difference	T_{HP}	0	2	–	μs
	Rising Time	T_{HR}	–	–	0.5	μs
	Falling Time	T_{HF}	–	–	0.5	μs
Vertical Sync Output Pulse	Width	T_{VO}	–	4H	–	μs H=1/15.75KHz
	Phase Difference	T_{VPO}	–	1H	–	μs odd field
	Phase Difference	T_{VPE}	–	1.5H	–	μs even field
	Rising Time	T_{VR}	–	–	2	μs
	Frequency	f_{FRP}	7.67	7.87	8.07	KHz
Polarity Alternating Signal	Delay time	T_{FD}	–	–	4	μs
	Falling time	T_{VF}	–	–	2	μs

Interface Pin Assignment

Pin No.	Symbol	Function	Input/Output
1	HSY	Horizontal sync. input/output	Output
2	FRP	Video polarity alternating signal	Output
3	CSY	Composite sync. signal	Input
4	V _{GH}	Supply voltage for gate driver (hi level)	Input
5	V _{GL}	Supply voltage for gate driver (low level)	Input
6	V _B	Video signal (blue)	Input
7	VR	Video signal (red)	Input
8	VG	Video signal (green)	Input
9	GND	Ground	Input
10	V _{DD}	Supply voltage for controller	Input
11	V _{SH}	Supply voltage for source driver	Input
12	GND	Ground	Input
13	NC	No connection	Input
14	VS _Y	Vertical sync. input/output	Output
15	PSI	Synchronize pulse for backlight inverter	Output
16	GND	Ground	Output

Dimensional Outline
