AND Displays

AND-TFT-5MQ*

320 x 234 Pixels
LCD Color Monitor

The AND-TFT-5MQ is a compact full color TFT LCD module, that is suitable for applications such as a portable television (PAL and NTSC) and a display for monitors. It will also displays a VGA (640x480) input.

This device consists of a twisted nematic (TN) liquid crystal cell, that incorporates a TFT-array that has 320 x 234 pixels on a 5 inch diagonal screen, X and Y drivers, an LSI controller, and a built-in CCFL backlight and inverter.

***ALSO AVAILABLE:**
AND-TFT-5MQ-DHB (high bright backlight installed)
AND-TFT-5MQ-DHBAR (anti-reflective film installed)

Features

- NTSC composite (1.0Vp-p) or Analog RGB input
- Accepts VGA Input (Analog RGB)
- 5 inch (13 cm) diagonal screen
- High brightness CCFL backlight (210 Nits)
- Built-in CCFL inverter
- Operating temperature range -10 to 60° C
- Storage temperature range -30 to 80° C
- 12V single power supply
- 6 o'clock viewing angle
- ***ALSO AVAILABLE:**
  - High brightness CCFL backlight (420 Nits) for the **AND-TFT-5MQ-DHB**
  - Anti-reflective front surface coating available for the **AND-TFT-5MQ-DHBAR**

Mechanical Characteristics

Item	Specification	Unit
Screen Size	5 inch (13 cm) diagonal	
Outline Dimensions	127.2 typ. (W) x 92.7 (H) x 20 max. (D)	mm
Active Area	102.7 (W) x 74.9 (H)	mm
Drive System	a-Si TFT Active matrix, a line at a time Non-Interlace Drive	
Pixel Number (RGB trio)	320 (W) x 234 (H)	–
Sub Pixel No.	960 (W) x 234 (H)	–
Sub Pixel Arrangement	RGB stripe	–
Pixel Pitch	0.320 (W) x 0.320 (H)	mm

Absolute Maximum Rating

Item			Symbol	Conditions	Absolute Maximum Rating		Unit
					Min.	Max.	
Supply Voltage	for Video Circuit		VCC	Ta = 25°C	VSS -0.2	13.0	V
	for Backlight Inverter		VBL	Ta = 25°C	VSS -0.2	13.0	V
Input Signal Voltage	Video	Composite	CVID	Ta = 25°C, VCC = 12V VBL = 12V	–	1.5	Vp-p
		Analog RGB	VR, VG, VB			1.5	Vp-p
	Composite sync.		CSYNC		–	1.5	Vp-p
	Others		BRT, CONTRAST, COLOR		VSS -0.2	VDD +0.2	V
Operating Temperature			Top	–	-10	60	°C
Storage Temperature			Tstg	–	-30	80	°C
Humidity (No condensation of water)			–	–	10	90	% RH

Electrical Specification

Item		Symbol	Conditions	Specifications			Units
				Min.	Typ.	Max.	
Current Consumption	for Video Circuit	ICC	–	–	0.18	TBD	A
	for Backlight Inverter	IBL	+12V, DIM = Max.	–	0.35	TBD	A
Output Voltage		VDD	VCC = VBL = +12V	4.8	5.0	–	V
Vertical display start		Vpos	NTSC (59.94Hz)	–	19	–	H
Vertical display term		Vdis	NTSC (59.94Hz)	–	253	–	H
Horizontal display		Hpos	NTSC (15.73kHz)	–	12.6	–	µs
Horizontal display term		Hdis	NTSC (15.73kHz)	–	63.39	–	µs

(Ta = RT, VSS = 0V)

Recommended Operating Conditions

Item			Symbol	Conditions	Specifications			Unit
					Min.	Typ.	Max.	
Supply Voltage	for Video Circuit		VCC	–	10.0	12.0	13.0	V
	for Backlight Inverter		VBL	–	10.0	12.0	13.0	V
Input Signal Voltage	Video	Composite	CVID	75Ω	–	1.0	–	Vp-p
		Analog RGB	VR,VG,VB			0.7	–	Vp-p
	Composite sync.		CSYNC	75Ω	–	1.0	–	Vp-p
	Others		BRT, CONTRAST, COLOR,		0		+5.0	V
Frame Frequency			fVDN	NTSC	58	59.94	62	Hz
			fHDN		15.2	15.73	16.2	kHz
Color Sub-carrier Frequency			fCOLOR	NTSC	3.579395	3.579545	3.579695	MHz
Color Sub-carrier Amplitude			VCOLOR	NTSC	40	–	–	mV

Optical Specifications

Item	Symbol	Conditions	Specifications			Unit
			Min.	Typ.	Max.	
Luminance	LUM	RGB = 0/0.7V	180	210	–	cd/m
Contrast Ratio	CR	RGB = 0/0.7V	80	120*	–	–
Specular Reflectance*	RS		–	6	–	%
Viewing Angle	ϕ L/ ϕ R	RGB = 0/0.7V	–	55/55	–	deg
	ϕ U/ ϕ D		–	15/35	2	deg

***Please note the spec changes for the AND-TFT-5MQ-DHB/AR**

Contrast Ratio (AND-TFT-5MQ-DHB)	CR	RGB = 0/0.7V	80	**420**	–	–
Specular Reflectance (AND-TFT-5MQ-DHBAR)	RS		–	6	**2**	%

Interface Pin Assignment Connector 1: Connector (Elco) 6200-500-28-800

Pin No.	Symbol	Function		Input/Output
1	BRI	Brightness Control	0 to 5V (1)	Input
2	CNT	Contrast Controls	0 to 5V (1)	Input
3	PCT	Picture Controls	0 to 5V (1)	
4	COL	Color Purity Control	0 to 5V (1)	Input
5	NC	No connect		
6	VIN	Composite Video Input	(1.0Vp-p, 75Ω)	Input
7	GND	Video Ground		–
8	B	Video Input G	(0.7Vp-p, 75Ω)	Input
9	G	Video Input G	(0.7Vp-p, 75Ω)	Input
10	R	Video Input R	(0.7Vp-p, 75Ω)	Input
11	VSW	Video Signal Selection	(0V:Composite, 5V:RGB) (2)	Input
12	$\overline{L}$/R	Scanning Direction Switch	0V: Left to Right:: 5V: Right to Left	Input
13	VIY	Vertical Sync. input		Input
14	CSY	Composite Sync. or Horizontal Sync.		Input
15	VSY	Vertical Sync. I/O		
16	HSY	Horizontal Sync. I/O		
17	CKC	Control for selecting I/O signal		Input
18	VGA	VGA function select	0V:Composite or RGB, 5V : VGA (4)	Input
19	HPS	H-position adjustment	(1)	Input
20	GND	Ground		–
21	VDD	+5V Output for Control Signal		Output
22	GND	Ground		
23	GND	Ground		
24	VCC	Power Input 12V		Input
25	VCC	Power Input 12V		Input
26	GND	Ground		–
27	DIM	Dimmer Control	0V: off, 2V: full on, open: full on	Input
28	ENB	On/Off for Inverter	0V: Off, 5V:On	Input

1. Default value is used if pin is left open
2. Default is high, RGB Input
3. Pin 17 (CKC) is used to select the functions with pins 14, 15, & 16 as follows:
4. Pin 18 (VGA) is used in conjuction with Pin 11 (VSW) to select the video input as follows:

Dimensional Outline

General mechanical tolerance = 0.5mm