AND-TFT-64MQ-2

320 x 234 Pixels
LCD Color Monitor

The AND-TFT-64MQ-2 is a compact full color TFT LCD module, that is suitable for applications such as a portable television (NTSC or PAL) and a display for portable equipment. This device consists of a twisted nematic (TN) liquid crystal cell, that incorporates a TFT-array that has 320 x 234 pixels on a 6.4 inch diagonal screen, X and Y drivers, an LSI controller, and a built-in CCFL backlight and inverter.

Features

- 6.4 inch (16 cm) diagonal screen
- NTSC/PAL composite (1.0Vp-p) input
- Accepts VGA Input (Analog RGB)
- High brightness CCFL backlight (300 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

Mechanical Characteristics

Item	Specification	Unit
Screen Size	6.4 inch (16 cm) diagonal	
Outline Dimensions	156.3 typ. (W) x 119.8 (H) x 20 max. (D)	mm
Active Area	130.6 (H) x 97.3 (V)	mm
Drive System	a-Si TFT Active matrix, a line at a time Non-Interlace Drive	
Pixel Number (RGB trio)	320 (H) x 234 (V)	–
Sub Pixel No.	960 (H) x 234 (V)	–
Sub Pixel Arrangement	RGB stripe	–
Pixel Pitch	0.136 (H) x 0.416 (V)	mm

Absolute Maximum Rating

Item		Symbol	Conditions	Absolute Maximum Rating		Unit
				Min.	Max.	
Supply Voltage for Source Driver		V_{SH}	–	-0.5	+16	V
Supply Voltage for Gate Driver	L Level	V_{GL}	–	-7	20	V
	L Level	V_{GL}	–	-7	+20	V
Supply Voltage for Controller		V_{DD}	–	-0.3	+6.5	V
DC bias voltage of common electrode		Vcom	–	+2	+6	V
Analog input signals		V_B, V_R, V_G	–	–	12	V
Digital input signals		–	$\overline{HSY}$, CSY, $\overline{VSY}$, CKC	-0.5	5.5	V
Digital output signals		–	$\overline{HSY}$, $\overline{VSY}$, PSI, PSC	-0.5	5.5	V
Storage Temperature		–	–	-30	+80	°C
Operation Temperature		–	–	-10	+80	°C

Electrical Specification

Item		Symbol	Conditions	Specifications			Units
				Min.	Typ.	Max.	
Current Consumption	for Video Circuit	ICC	–	–	0.19	0.30	A
	for Backlight Inverter	IBL	+12V, DIM = Max.	–	0.37	0.50	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 source driver		V_{SH}	–	+13.5	+14	+14.5	V
Supply voltage for gate driver	H Level	V_{GH}	–	+19	+20	+24	V
	L Level	V_{GL}	–	-5.5	-5	-4	V
Supply voltage for controller		V_{DD}	–	+4.7	+5	+5.3	V
Analog input signal		V_R, V_G, V_B	–	–	–	–	
Digital input voltage	H Level		$\overline{HSY}$, CSY, $\overline{VSY}$, CKC	+2.4	–	+5	V
	L Level			-0.3	–	+0.8	V
Digital output voltage	H Level		$\overline{HSY}$, $\overline{VSY}$, PSI, PSC	+2.4	+4	+5	V
	L Level			0	–	+0.45	V

Optical Specifications

Item		Symbol	Conditions	Specifications			Unit
				Min.	Typ.	Max.	
Viewing Angle	Horizontal	θ	CR>10	± 50	± 60	–	deg
	Vertical	θ (to 12 o'clock)		10	15	–	deg
		θ (to 12 o'clock)		30	35	–	deg
Contrast Ratio		CR	RGB = 0/0.7V	80	120	–	–
Response Time	Rise	Tr	θ = 0°	–	–	30	ms
	Fall	Tf		–	–	50	ms
Specular Reflectance		RS		–	6	–	%
Luminance		LUM	RGB = 0/0.7V	250	300	–	cd/m^2
White Chromaticity		x		0.255	0.305	0.355	–
		y		0.300	0.350	0.400	–
Lamp Life Time			+25°C	10,000	–	–	hr

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

Pin No.	Symbol	Function		I/O
1	BRI	Brightness adjustment	Note 1	Input
2	CNT	Contrast adjustment	Note 1	Input
3	NC	No connection		–
4	COL	Color adjustment	Note 1	Input
5	NC	No connect		–
6	VIN	Composite Video Input		Input
7	GND	Video Ground		–
8	B	Video Signal (Blue)	Note 2	Input
9	G	Video Signal (Green)	Note 2	Input
10	R	Video Signal (Red)	Note 2	Input
11	SW	Composite or RGB input selection	Note 3	Input
12	RL	Right or left direction selection pin	Note 4	Input
13	VIY	Vertical sync. input		Input
14	CSY	Composite Sync. or Horizontal Sync.	Note 5	Input
15	$\overline{VSY}$	Vertical Sync. I/O	Note 5	I/O
16	$\overline{HSY}$	Horizontal Sync. I/O	Note 5	I/O
17	CKC	Control for selecting signal	Note 5	Input
18	VGA	QVGA function select	Note 6	Input
19	HPS	H-position adjustment	Note 1	Input
20	NPC	NTSC/PAL Input or Output	Note 10	Input
21	VDD	+5V power output		Output
22	12G2	$12V_{DC}$ power input ground	Note 9	–
23	12G1	$12V_{DC}$ power input ground	Note 9	–
24	12V2	$12V_{DC}$ power input	Note 9	Input
25	12V1	$12V_{DC}$ power input	Note 9	Input
26	GND	Ground		–
27	DIM	Dimmer adjustment for inverter	Note 7, 9	Input
28	ENB	Enable signal for Inverter	Note 8, 9	Input

1. Default value is used if pin is left open.
2. 0.7 VPP standard RGB signal.
3. Default (Hi, 5V) RGB input.
4. Default (hi, 5V) shift right.
5. CKC pin can select the function of pin 16, 15, 14 as follows:

CKC	Pin 16	Pin 15	Pin 14
Hi (+5V, default)	HSY output	VSY output	CSY input
Low (0V)	HSY input	VSY input	clock input (18.9MHz)erter

6. Hi (=5V) for VGA input, Low (0V, default) for NTSC or RGB input =
   The relationship of SW pin & VGA pin is defined as the following table:

SW	VGA	Selected input
0	0	TV mode - Composite input
0	1	NO USE
1	0	TV mode - R.G.B. input
1	1	VGA input

7. Range: 0~2 ; open (default) : full light
8. OV to shunt down; 5V or open to enable
9. These pins direct pass to the Switching Power Supply 16-pin connector
10. NTSC=Hi (+5V), PAL=LOW (0V). Generally, this pin will output the auto-detect signal (NTSC=1, PAL=0). However, if force the signal to high or low, the auto-detect function will be disabled.

Connector 2 (16 Pins)

Pin No	Symbol	I/O	Function	Remark
1	12V1	O	12V output to power supply	Note 11
2	12V2	O	12V output to power supply	Note 11
3	12G1	O	Ground for 12V	Note 11
4	12G2	O	Ground for 12V	Note 11
5	DIM	I	Adjust backlight (0-2V analog input)	
6	ENB	I	Power down mode enable	
7	13V	I	13V input	
8	GND	I	Ground for 14V input	
9	V_{EE}	I	14V input	
10	GND	I	Ground for 5V input	
11	V_{DD}	I	5V input	
12	PSC	O	Synchronized signal for converter	
13	PSI	O	Synchronized signal for inverter	
14	-5V	I	-5V input	
15	GND	I	Ground for 20V	
16	20V	I	20V input	

11. 12VDC output from pin 22-25 of 28-pin connector

Backlight Driving

Pin No.	Symbol	Function	Remark
1	VL1	Input terminal (Hi voltage side)	
2	VL2	Input terminal (Low voltage side)	Note 12

12. Low voltage side of backlight inverter connects with ground of inverter circuits.

Input/Output Connector

A) **Video Input Connector: ELCO 00-6200-500-028-800**
Down Connector
Pin No: 28
Pitch: 1.0 mm

B) **Power Input Connector: ELCO 0-6200-500-016-800**
Pin No: 16
Pitch: 1.0 mm

C) **Backlight Connector: JST BHR-03VS-1**
Pin No: 3
Pitch: 4 mm

Dimensional Outline

General mechanical tolerance = 0.5mm