



**SPECIFICATION
FOR
LCD Module
IVO062-01**

MODULE:	IVO062-01
CUSTOMER:	

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General Description

* Description

IVO062-01 is a color active matrix TFT (Thin Film Transistor) LCD (liquid crystal display) that uses amorphous silicon TFT as a switching device. This model is composed of a Transmissive type TFT-LCD Panel, driver circuit, back-light unit. The resolution of a 6.2" TFT-LCD contains 800RGB x 480 pixels, and can display up to 16.7M colors.

* Features

-Low Input Voltage: VCC: 3.0V~3.6V

-Display Colors : 16.7M colors

-CPU Interface: 24bit parallel (RGB) input timing

General Information Items	Specification	Unit	Note
	Main Panel		
Display area(AA)	137.52 (H) * 77.232 (V) (6.2 inch)	mm	-
Driver element	a-Si TFT active matrix	-	-
Display colors	16.7M	colors	-
Color Gamut	50	%	-
Number of pixels	800 (RGB) *480	dots	-
Pixel arrangement	RGB vertical stripe	-	-
Pixel pitch	0.1719(H) *0.1609(V)	mm	-
Viewing angle	6:00	o'clock	-
Drive IC	ILI6123H+ ILI5480	-	-
Display mode	Normally White	-	-
Operating temperature	-20~+70	℃	-
Storage temperature	-30~+80	℃	-

* Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal(H)	-	155.20	-	mm	-
	Vertical(V)	-	88.20	-	mm	-
	Depth(D)		4.8		mm	-
Weight		-	TBD	-	g	-



1. Optical Characteristics

The following items are measured under stable conditions. The optical characteristics should be measured in a dark room or equivalent state

Temperature Range	Storage	-30 ~ 80	°C	
	Operating	-20 ~ 70	°C	
Response Time		8 (Typ.)	ms	With IVO requirement driving condition, Refer to Section10
Contrast Ratio		600 (Typ.)		
Viewing Angle		Up-down : +70/-70 (Typ.) Left-right : +75/-75 (Typ.) Up-down : +60/-60 (Min.) Left-right : +65/-65 (Min.)	deg.	CR ≥ 10 with IVO requirement driving condition, Refer to Section10
Chromaticity	NTSC Ratio	50% (Typ.)	%	With reference back light spectrum, see in 11 (with reference polarizer)
	White	(0.310 ± 0.05, 0.330 ± 0.05,)		
Cell Transmittance		(4.5 %) (Typ.)	%	
Color Filter Structure		Stripe RGB		



Note :

1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).
2. Contrast measurements shall be made at viewing angle of $\Theta = 0$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. (see FIGURE 1) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. Transmittance is the Value with Polarizer
4. The color chromaticity coordinates specified in Table 5 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.
5. The electro-optical response time measurements shall be made as FIGURE 3 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is T_r , and 90% to 10% is T_d .



2. Electrical Characteristics

2.1 Absolute Maximum Rating (Ta=25 GND=0V)

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Digital Supply Voltage	VDDD	-0.5	-	+ 5.0	mA	
Analog Supply Voltage	VDDA	-0.5	-	+ 15.0	V	-

2.2 DC Electrical Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Digital Supply Voltage	VDDD	3.0	-	3.6	mA	-
Analog Supply Voltage	VDDA	-	10.2	13.5	V	-
TFT Gate ON Voltage	VGH	14V	15V	16V	V	-
TFT Gate OFF Voltage	VGL	-8V	-7V	-6V	V	-
TFT Common Voltage	VCOM	-	2.6	-	V	-

2.3 LED Backlight Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Forward Current	I _F	-	160	-	mA	
Forward Voltage	V _F	-	9.6	-	V	-
Uniformity	AVg	75	-	-	%	-
LCM Luminance	L _V	-	TBD	-	cd/m ²	



3.Outline dimension

NO.	SYMBOL	NO.	SYMBOL
1	AGND	31	VSD
2	AVDD	32	MIDE3
3	VCC	33	RSTB
4	R0	34	STBYB
5	R1	35	SHLR
6	R2	36	VCC
7	R3	37	UPDN
8	R4	38	GND
9	R5	39	AGND
10	R6	40	AVDD
11	R7	41	VCCpin
12	G0	42	DITH
13	G1	43	NC
14	G2	44	NC
15	G3	45	V10
16	G4	46	V9
17	G5	47	V8
18	G6	48	V7
19	G7	49	V6
20	B0	50	V5
21	B1	51	V4
22	B2	52	V3
23	B3	53	V2
24	B4	54	V1
25	B5	55	NC
26	B6	56	VGH
27	B7	57	VCC
28	DCLK	58	VGL
29	DE	59	GND
30	HSD	60	NC

NOTES:

1. Display mode: Transmissive
2. Interface Type: System parallel
3. Viewing direction: 6:00
4. Driver IC: ILI5480+ILI6123H (S)
5. Input voltage: 3.0~3.6V
6. Backlight: White LED(3x8LED parallel)
If=160mA Vf=9.6V
7. Operating temperature: -20°C ~ +70°C
8. Storage temperature: -30°C ~ +80°C
9. Interface connector: FPC
10. Request ROHS

LED CIRCUIT DIAGRAM

Rev.	Revision content description	Date
A	FIRSTISSUE	2013.9.3

	深圳市如新电子有限公司		
	TOLERANCE (公差)	Mod. Name	
TOLERANCE UNLESS OTHERWISE SPECIFIED	X.X±0.3	IVO062-01	LCM
UNIT	DESIGNED(structure)	DESIGNED(electron)	APPROVED
mm	JHJ		DRAWING NAME
			ASSEMBLE



4. Input terminal Pin Assignment

Pin NO.	Symbol	Function
1	AGND	Analog Ground
2	AVDD	Analog Power
3	VCC	Digital Power
4-11	R0-R7	Blue Date Bit
12-19	G0-G7	Green Date Bit
20-27	B0-B7	Red Date Bit
28	DCLK	Clock input
29	DE	Data enable input
30	HSD	horizontal SYNC input
31	VSD	Vertical SYNC input
32	MODE	DE/SYNC mode select. H:DE mode. L:HSD/VSD mode
33	RSTB	External reset input,low active
34	STBYB	External standby mode selection,low active
35	SHLR	Left/Right shift control
36	VCC	Digital Power
37	UPDN	UP/Down rotate control
38	GND	Digital Ground
39	AGND	Analog Ground
40	AVDD	Analog Power(10.2v)
41	VCOMIN	For external vcom dc input
42	DITH	Dithering function enable/disable. 0:enable;1:disable
43	NC	NO connect
44	NC	NO connect
45-54	V10-V1	Gamma correction voltage reference
55	NC	NO connect
56	VGH	Positive Power for TFT(+ 18V)
57	VCC	Digital Power
58	VGL	Negative Power for TFT(-8V)
59	GND	Digital Ground
60	NC	NO connect



5. Timing Characteristic

Please refer to ILI6123H data sheet for more details.

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Horizontal display area	thd	800			DCLK
DCLK frequency	Fclk	-	30	50	MHZ
1 Horizontal line	th	928			DCLK
HSYNC pulse width	thpw	1	48	-	
HSYNC Back Porch (blanking)	thb	-	88	-	
HSYNC front porch	thfp	-	40	-	
Vertical display area	tvd	480			H
VSD period time	tv	-	525	-	
VSD pulse width	tvpw	-	3	-	
VSD Back Porch (blanking)	tvb	-	32	-	
VSD front porch	tvfp	-	13	-	



6. Reliability Test Result

Item	Condition	Sample Size	Test Result	Note
Low Temperature Operating Life test	-20℃, 96HR	3ea	pass	-
Thermal Humidity Operating Life test	40℃, 90%RH, 96HR	3ea	pass	-
Temperature Cycle ON/OFF test	-20℃ ↔ 70℃, ON/OFF, 20CYC	3ea	pass	(1)
High Temperature Storage test	80℃, 96HR	3ea	pass	-
Low Temperature Storage test	- 30℃, 96HR	3ea	pass	-
Thermal Shock Resistance	The sample should be allowed to stand the following 5 cycles of operation: TSTL for 30 minutes -> normal temperature for 5 minutes -> TSTH for 30 minutes -> normal temperature for 5 minutes, as one cycle, then taking it out and drying it at normal temperature, and allowing it stand for 24 hours	3ea	pass	
Box Drop Test	1 Corner 3 Edges 6 faces, 66cm(MEDIUM BOX)	1box	pass	-

Note (1) ON Time over 10 seconds, OFF Time under 10 seconds

7. Packing

TBD



8. Cautions and Handling Precautions

8.1 Handling and Operating the Module

(1) When the module is assembled, it should be attached to the system firmly.

Do not warp or twist the module during assembly work.

(2) Protect the module from physical shock or any force. In addition to damage, this may cause improper operation or damage to the module and back-light unit.

(3) Note that polarizer is very fragile and could be easily damaged. Do not press or scratch the surface.

(4) Do not allow drops of water or chemicals to remain on the display surface.

If you have the droplets for a long time, staining and discoloration may occur.

(5) If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.

(6) The desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane.

Do not use ketene type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.

(7) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth.

In case of contact with hands, legs, or clothes, it must be washed away thoroughly with soap.

(8) Protect the module from static; it may cause damage to the CMOS ICs.

(9) Use finger-stalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.

(10) Do not disassemble the module.

(11) Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.

(12) Pins of I/F connector shall not be touched directly with bare hands.

(13) Do not connect, disconnect the module in the "Power ON" condition.

(14) Power supply should always be turned on/off by the item 6.1 Power On Sequence & 6.2 Power Off Sequence

8.2 Storage and Transportation.

(1) Do not leave the panel in high temperature, and high humidity for a long time.

It is highly recommended to store the module with temperature from 0 to 35 °C and relative humidity of less than 70%

(2) Do not store the TFT-LCD module in direct sunlight.

(3) The module shall be stored in a dark place. When storing the modules for a long time, be sure to adopt effective measures for protecting the modules from strong ultraviolet radiation, sunlight, or fluorescent light.

(4) It is recommended that the modules should be stored under a condition where no condensation



is allowed. Formation of dewdrops may cause an abnormal operation or a failure of the module.

In particular, the greatest possible care should be taken to prevent any module from being operated where condensation has occurred inside.

(5) This panel has its circuitry FPC on the bottom side and should be handled carefully in order not to be stressed.

9. BHL&BMDT Customer Quality Service Process



12. BHL&BMDT Customer Quality Service Process

In order to provide better service to Customer, BHL&BMDT shall apply the after-sales product quality service process as below:

1. According to the P/O from Customer, BHL&BMDT should deliver required product to the place appointed by Customer.
2. Customer will do IQC for the incoming product.
3. Inspection standard should be provided by BHL&BMDT, and it will be valid after confirmed by Customer. Inspection and Defects determination should be carried out according to the standard agreed by both Parties.
4. In order to guarantee in-time communication of product quality information and effective service, QA staff on Customer side should send Weekly Quality Report to the appointed CS staff in BHL&BMDT.
5. After BHL&BMDT get related information, both sides should arrange time and place to determine the defects found by Customer.
6. BHL&BMDT should cooperate with Customer for special quality requirement.
7. After confirmed by both side, BHL&BMDT should be responsible for the defect products which caused by its quality problem. BHL&BMDT should take back the confirmed defect product and return the good product to the place required by customer.
8. BHL&BMDT agree to provide related training of LCD product technology and usage.
9. Customer should use the LCD product according to the instruction. BHL&BMDT will not be responsible for the defect product caused by violation of Users' Instruction.
10. Both parties should deal with the quality problem with friendly cooperative policy. And both parties should negotiate to deal with the defect products of which the responsibility is not very clear.