

PRODUCT SPECIFICATION **FOR LCD MODULE**

Revision: 1.0

Model No: LS043I09-R-V1

Module Type: COG+FPC+B/L

APPROVED SIGNATURE

- Approved Product Specification only
- Approved Product Specification and Samples

<u>Prepared By</u>	<u>Checked By</u>	<u>Approved By</u>

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1. General Description

LS043I09-R-V1 is a transmissive type a-Si TFT-LCD (amorphous silicon thin film transistor liquid crystal display) module, which is composed of a TFT-LCD panel, a driver circuit and a backlight unit. The panel size is 4.3 inch and the resolution is 480(RGB)*272, the panel can display up to 262k colors.

2. Physical Features

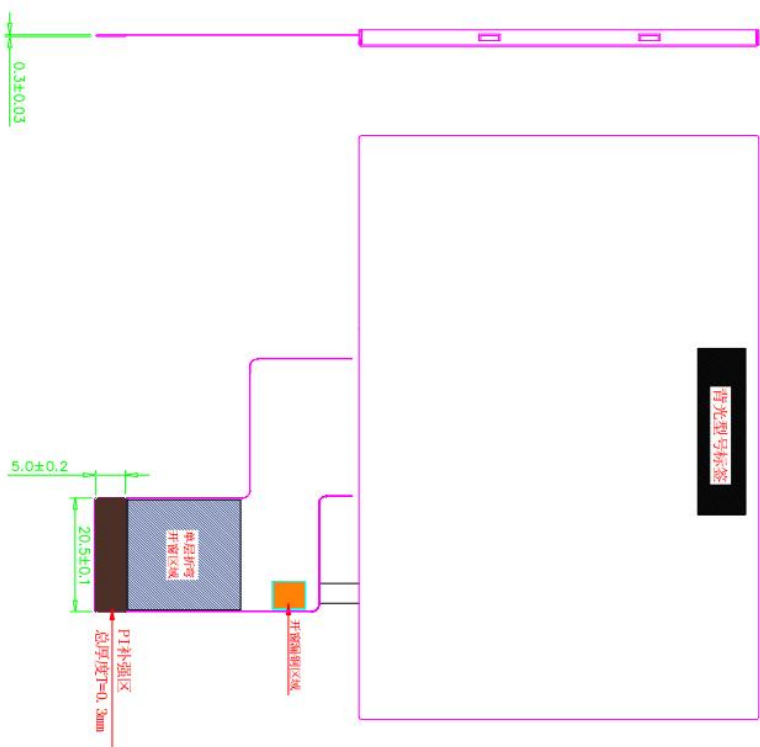
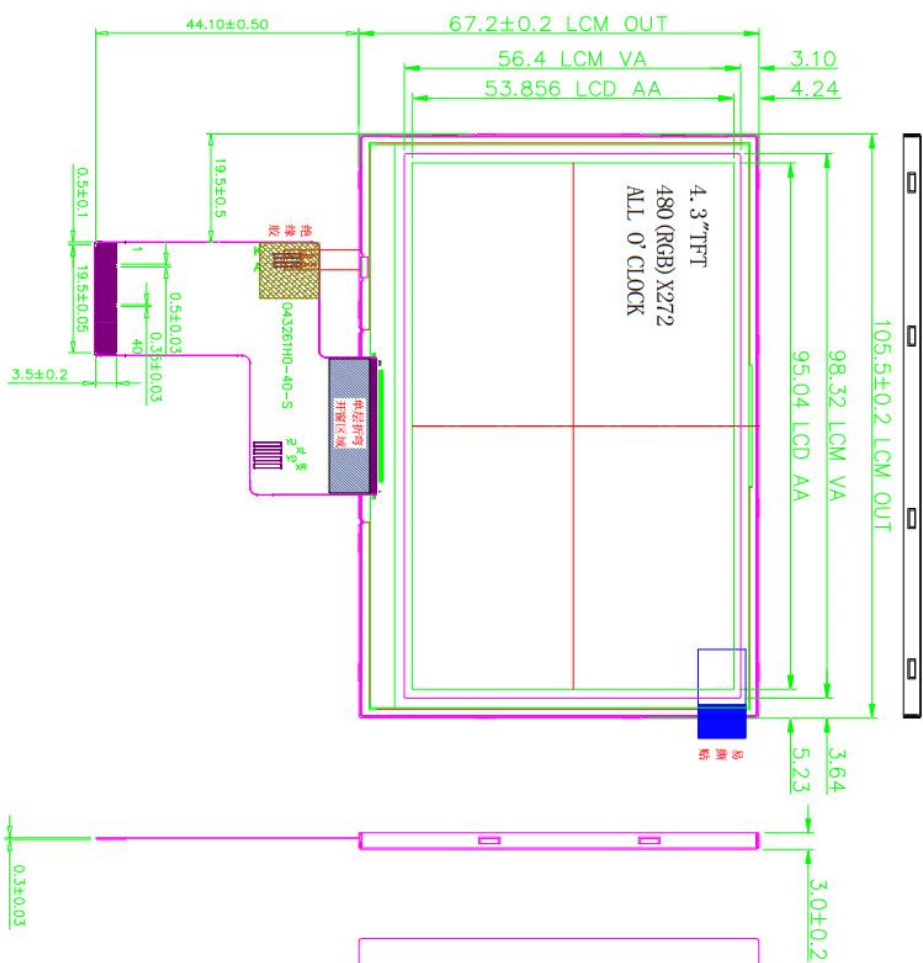
Display Mode	TFT-LCD Module
	Active matrix TFT, Transmissive type
Display Format	Graphic 480(RGB)×272 Dot-matrix
Input Data	RGB
Viewing Direction (Grayscale Inversion)	Free (IPS)
Drive	ST7282A

3. Mechanical Specification

Item	Specification	Unit
Module size (H×V×D)	105.5 ×67.2 ×3.0	mm
Number of dots	480(RGB) ×272	pixel
Active area (H×V)	95.04×53.856	mm

4. Outline Dimension

NO. SIGNAL	1	LEDK
2	LEDA	
3	GND	
4	VCC	
5	R0	
6	R1	
7	R2	
8	R3	
9	R4	
10	R5	
11	R6	
12	R7	
13	G0	
14	G1	
15	G2	
16	G3	
17	G4	
18	G5	
19	G6	
20	G7	
21	B0	
22	B1	
23	B2	
24	B3	
25	B4	
26	B5	
27	B6	
28	B7	
29	GND	
30	CLK	
31	DSP /NK	
32	Hsync	
33	Vsync	
34	DEN	
35	NC	
36	GND	
37	XR(NC)	
38	YD(NC)	
39	XL(NC)	
40	YU(NC)	



NOTE:

- | | |
|-----------------------------|--------------------------|
| 1. LCD TYPE : | 4.3" TFT |
| 2. DRIVER IC : | ST7282A |
| 3. VIEWING DIRECTION : | ALL 0°CLOCK |
| 4. BACKLIGHT: | WHITE LED 7 CHIPS Series |
| 5. OPERATION TEMP : | -20°C~70°C |
| 6. STORAGEE TEMP : | -30°C~80°C |
| 7. GENERAL TOLERANCE: | ±0.2 |
| 8. * IS IMPORTANT DIMENSION | |

A1 •  K1

B/L CIRCUIT DIAGRAM

TOLERANCE		SCALE		立信 (万安) 智显科技有限公司			
.X	±	UNITS	N.T.S mm				
.XX	±	MATERIAL	DRG DATE			MODEL:	LS043109-R-V1
∠	± 1°		DRG BY			TITLE:	480(RGB)X272 DOTS
			CHK BY		DWG NO		P 1 OF 1
			APPROVED		P/N		VER.

5. Absolute Maximum Ratings

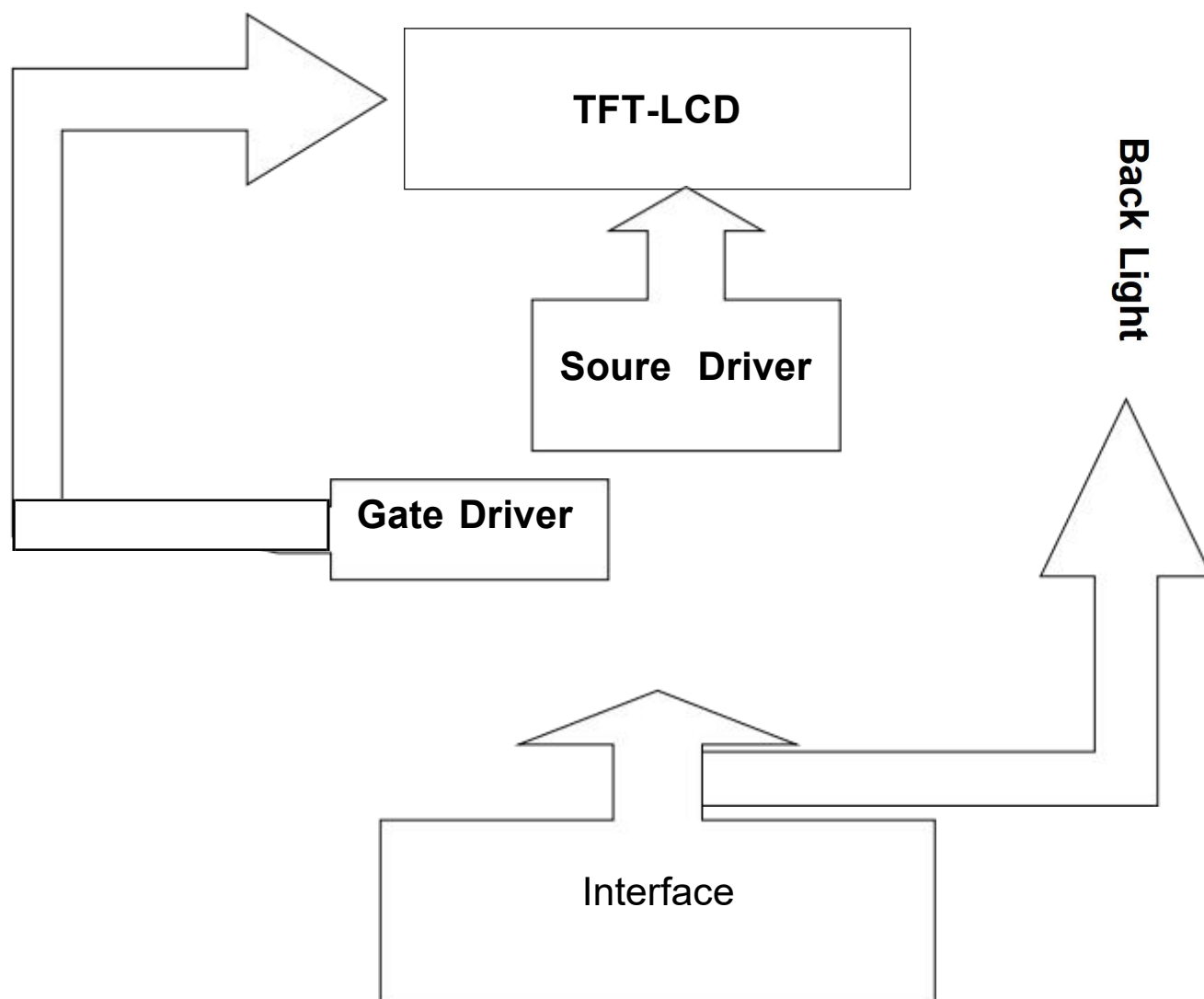
Item	Symbol	Min	Max	Unit	Remark
Supply voltage	VCC	-0.3	3.3	V	Note1 Note2
Supply voltage	IOVCC	-0.3	3.3	V	
Operating temperature	TOPR	-20	70	°C	
Storage temperature	TSTR	-30	80	°C	
Storage Humidity	HSTR	10	90	%RH	
Operating Ambient Humidity	HOPR	10	90	%RH	

6. Electrical Characteristics

Item		Symbol	Rating			Unit	Remark
			Min	Typ	Max		
Supply voltage		VCC	---	3.3	---	V	Note1
Supply voltage		IOVCC	---	3.3	---	V	
LED Forward Voltage		VF	---	21	---	V	
LED Forward Current		IR	---	20	---	MA	
LCD Luminance		BP	---	200	---	cd/m ²	
Input Voltage	L level	VIL	0	---	0.2*IOVCC	V	
	H level	VIH	0.8*VCC	---	IOVCC	V	

7. Module Function Description

7- 1. Block Diagram Of LCM



7-2. Pin Description

Pin NO.	Symbol	Description
1	LEDK	LED BACKLIGHT(CATHODE
2	LEDA	LED BACKLIGHT(ANODE
3	GND	GROUND
4	VCC	POWER SUPPLY
5	R0	RED DATA
6	R1	RED DATA
7	R2	RED DATA
8	R3	RED DATA
9	R4	RED DATA
10	R5	RED DATA
11	R6	RED DATA
12	R7	RED DATA
13	G0	GREEN DATA
14	G1	GREEN DATA
15	G2	GREEN DATA
16	G3	GREEN DATA
17	G4	GREEN DATA
18	G5	GREEN DATA
19	G6	GREEN DATA
20	G7	GREEN DATA
21	B0	BLUE DATA
22	B1	BLUE DATA
23	B2	BLUE DATA
24	B3	BLUE DATA
25	B4	BLUE DATA
26	B5	BLUE DATA
27	B6	BLUE DATA
28	B7	BLUE DATA
29	GND	GROUND
30	CLK	CLOCK SIGNAL
31	DISP(NC)	DISPLAY ON/OFF (NC) 内部已接高，开启显示模式
32	HSYNC	HORIZONTAL SYNC INPUT IN RGB MODE
33	VSNC	VERTICAL SYNC INPUT IN RGB MODE
34	DEN	DATA ENABLE
35	NC	NC
36	GND	GROUND
37	XR(NC)	TOUCH PLANE PIN/NC
38	YD(NC)	TOUCH PLANE PIN/NC
39	XL(NC)	TOUCH PLANE PIN/NC
40	YU(NC)	TOUCH PLANE PIN/NC

7-3 Timing Characteristics

480RGB X 272 Resolution Timing Table						
Item	Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency	Fclk	8	9	12	MHz	
DCLK Period	Tclk	125	111	83	ns	
HSYNC	Period Time	Th	487	531	598	DCLK
	Display Period	Thdisp	-	480	-	DCLK
	Back Porch	Thbp	3	43	43	DCLK
	Front Porch	Thfp	4	8	75	DCLK
	Pulse Width	Thw	2	4	75	DCLK
VSYNC	Period Time	Tv	276	292	321	H
	Display Period	Tvdisp	-	272	-	H
	Back Porch	Tvbp	2	12	12	H
	Front Porch	Tvfp	2	8	37	H
	Pulse Width	Tvw	2	4	37	H

Note: 1.It is necessary to keep Tvbp =12 and Thbp =43 in sync mode. DE mode is unnecessary to keep it.

2.Thbp+Thfp >=7

8. Electro-Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Color Chromaticity (CIE1931)	Red	Rx	$\theta_x=0^\circ, \theta_y=0^\circ$ Viewing Angle at Normal Direction at center point of panel with HKC backlight	Typ.-0.03	0.651	Typ.+0.03		(1)
		Ry			0.322			
	Green	Gx			0.265			
		Gy			0.589			
	Blue	Bx			0.138			
		By			0.105			
	White	Wx			0.292			
		Wy			0.339			
Color Gamut		NTSC		TBD		%	(2)	
Transmittance		T%	3.2	3.5		%	(3)	
Crosstalk(2D)		CT	$\theta_x=0^\circ, \theta_y=0^\circ$		TBD		%	(4)
Contrast Ratio		CR		2000	3000			(5)
Response Time		Tr+Tf			TBD		ms	(6)
Viewing Angle	Horizontal	θ_{x+}	CR $\geq$ 10 (With VA POL.)		80		Deg.	(7)
		θ_{x-}			80			
	Vertical	θ_{y+}			80			
		θ_{y-}			80			

9. Reliability and Inspection Standard

No.	Test Item		Test Conditions	Remark
1	High Temperature	Storage	80℃, 120Hr	
		Operation	70℃, 120Hr	
2	Low Temperature	Storage	-30℃, 120Hr	
		Operation	-20℃, 120Hr	
3	High Temperature and High Humidity		70℃, 90%RH, 120Hr	
4	Temperature Cycle	Storage	-10℃(1Hr)→25℃(5min)→60℃(1Hr) 32 Cycles	
		Operation	-20℃(1Hr)→25℃(5min)→60℃(1Hr) 25 Cycles	
5	Peeling Off (Storage)		≥ 500gf/cm	
6	FPC Bending Test		≥ 6,000 times, 2/sec	
7	Vibration Test(Storage)		50HZ, 30min, Amplitude: 2 cm, X/Y/Z directions	
8	Drop Test		60cm/ 3Corner/ 8Face, 1Cycle	
9	ESD test		±4KV, Human Body Mode, 150pF/330Ω; ±8KV, Air Mode, 150pF/330Ω;	

9.Records Of Version

Version	Revise Date	Page	Content
00		ALL	New released