PRODUCT SPECIFICATION FOR LCD MODULE

Revision: 1.0

Model No: LS0147I02-S-V3

Module Type: COG+FPC+B/L

APPROVED SIGNATURE

■ Approved Product Specification only

□ Approved Product Specification and Samples

Prepared By	Checked By	Approved By

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1. General Description

LS0147I02-S-V3 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 1.47 inch and the resolution is 172(RGB)*320, the panel can display up to 262k colors.

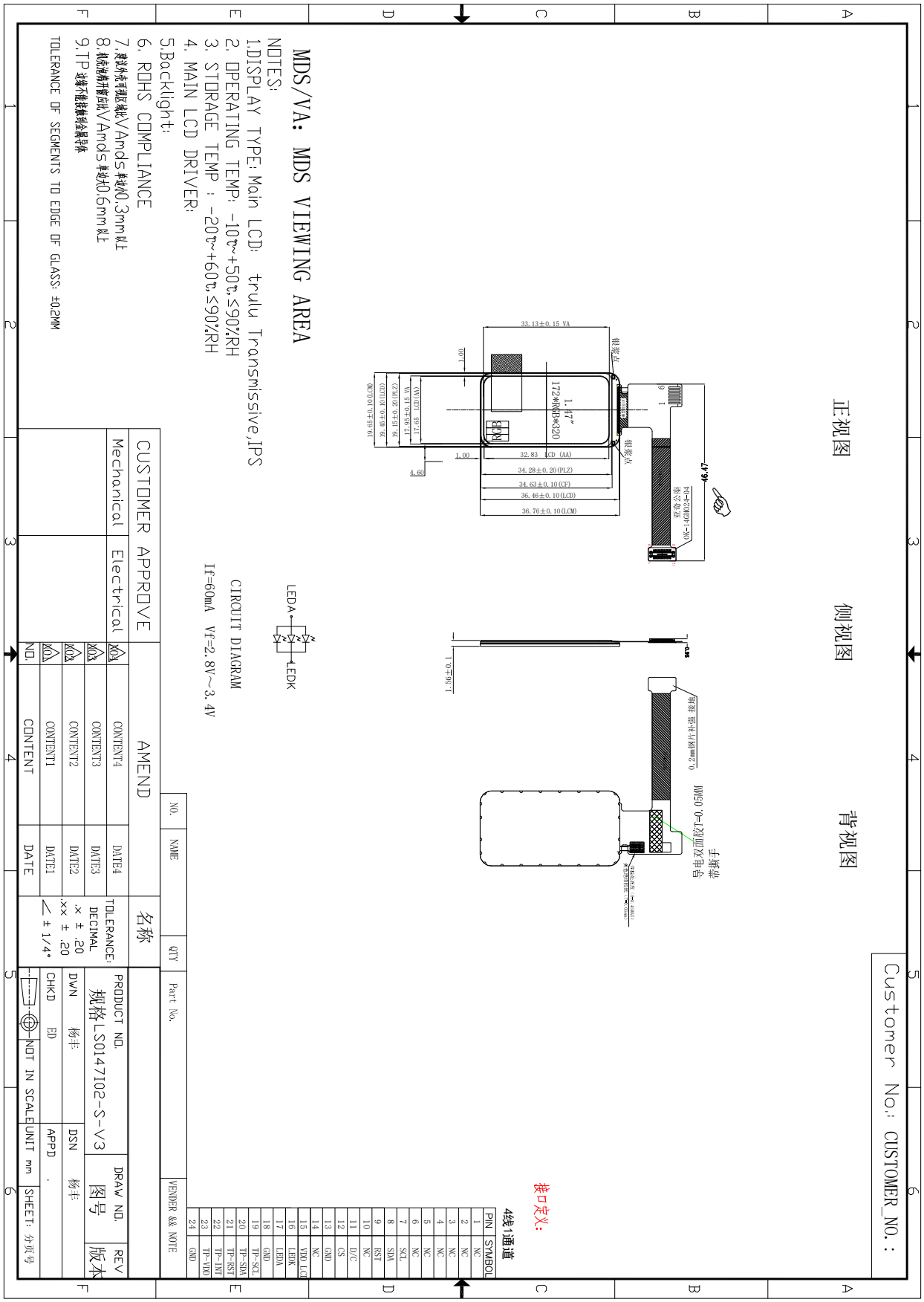
2. Physical Features

Display Mode	TFT-LCD Module
	Active matrix TFT, Transmissive type
Display Format	Graphic 172(RGB)×320 Dot-matrix
Input Data	4-line serial interface
Viewing Direction （Grayscale Inversion）	Free（IPS）
Drive	GC9307C

3. Mechanical Specification

Item	Specification	Unit
Module size (H×V×D)	19.65 ×36.76 ×1.56	mm
Number of dots	172(RGB) ×320	pixel
Active area (H×V)	17.65×32.83	mm

4. Outline Dimension



5. Absolute Maximum Ratings

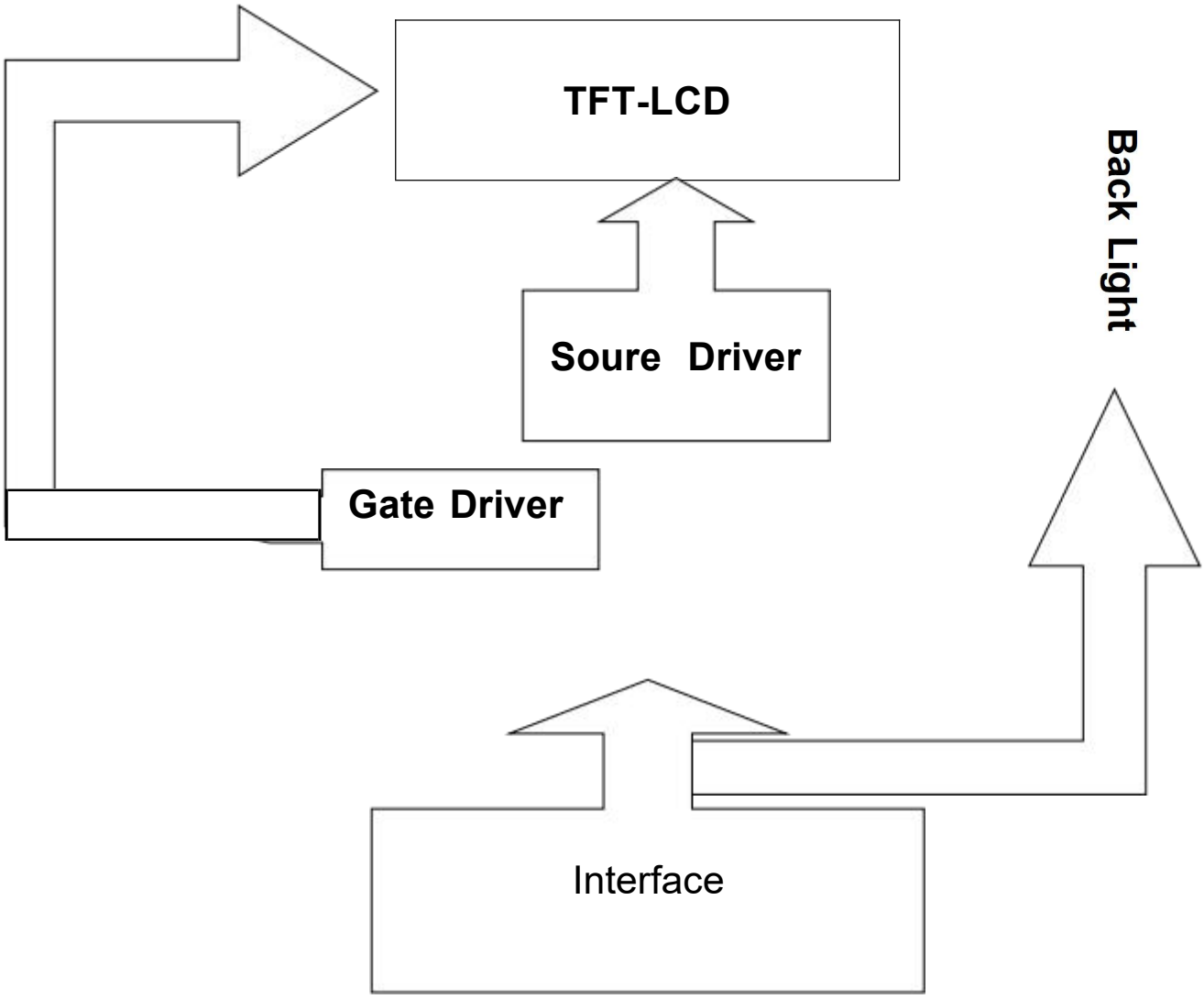
Item	Symbol	Min	Max	Unit	Remark
Supply voltage	VCC	-0.3	4.6	V	Note1 Note2
Supply voltage	IOVCC	-0.3	4.0	V	
Operating temperature	TOPR	-10	60	℃	
Storage temperature	TSTR	-20	70	℃	

6. Electrical Characteristics

Item		Symbol	Rating			Unit	Remark
			Min	Typ	Max		
Supply voltage		VCC	2.8	2.8	3.3	V	Note1
Supply voltage		IOVCC	1.65	2.8	3.3	V	
Input Voltage	L level	VIL	0	---	0.3*IOVCC	V	
	H level	VIH	0.7*IOVCC	---	IOVCC	V	

7. Module Function Description

7-1. Block Diagram Of LCM



7-2. Pin Description

PIN NO.	Symbol	I/O	Description
1	NC		
2	NC		
3	NC		
4	NC		
5	NC		
6	NC		
7	SCL	I	Serial clock pin
8	SDA	I/O	Serial data input/output PIN
9	RST	I	Reset signal pin
10	NC		
11	DC	I	Command and Data select pin
12	CS	I	Chip select pin
13	GND	P	Ground
14	NC		
15	VDD	P	Power voltage
16	LEDK	P	Power for LED backlight cathode
17	LEDA	P	Power for LED backlight anode
18	GND	P	Ground
19	TP_SCL	I	Serial clock pin
20	TP_SDA	I	Serial data input/output bidirection pin
21	TP_RST	I/O	Reset signal pin
22	TP_INT	I	Interrupt signal
23	TP_VDD	P	Power voltage
24	GND	P	Ground

7-3 Timing Characteristics

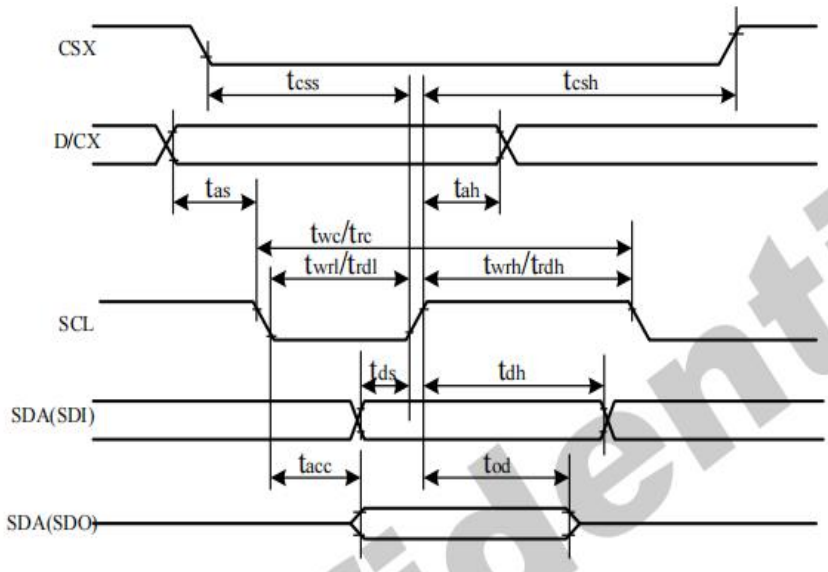


Table48.

Signal	Symbol	Parameter	min	max	Unit	Description
CSX	tcss	Chip select time (Write)	20	-	ns	
	tcsh	Chip select hold time (Read)	40	-	ns	
SCL	twc	Serial Clock Cycle (Write)	10	-	ns	
	twrh	SCL "H" Pulse Width (Write)	5	-	ns	
	twrl	SCL "L" Pulse Width (Write)	5	-	ns	
	trc	Serial Clock Cycle (Read)	150	-	ns	
	trdh	SCL "H" Pulse Width (Read)	60	-	ns	
	trdl	SCL "L" Pulse Width (Read)	60	-	ns	
D/CX	tas	D/CX setup time	10	-	ns	
	tah	D/CX hold time (Write/Read)	10	-	ns	
SDA/SDI (Input)	tds	Data setup time (Write)	5	-	ns	
	tdh	Data hold time (Write)	5	-	ns	
SDA/SD0 (Output)	tacc	Access time (Read)	10	-	ns	

Note: Ta = 25 °C, IOVCC=1.65V to 3.3V, VCI=2.5V to 3.3V, AGND=VSS=0V

Figure99.

8. Electro-Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time		Tr +Tf	θx = θy =0	---	---	35	ms	Note 1
Contrast Ratio		CR		600	800	---	---	Note 2
Transmittance		T%		3.2	4	---	%	
Color Chromaticity (CIE1931)	White	W x	θx = θy =0	---	0.303	---	---	
		W y		---	0.339	---	---	
Viewing angle	θ_T		CR > 10	80	---	---	Deg.	Note 3
	θ_B			80	---	---		
	θ_L			80	---	---		
	θ_R			80	---	---		
Luminance (I_F = 60mA)		L			TBD	---	cd/m2	Note4

Note1. Measuring Condition
(1) Measuring surrounding: dark room
(2) Ambient temperature: Ta=25℃
(3) 15min. warm-up time

Note2. Response time is the time required for the display to transition from Black to White (Rise Time, Tr) and from White to Black (Decay Time, Tf). The measurement instrument is DMS-803. For more information, please refer to FIG 1 and FIG 2.

Note3. Contrast Ratio (CR) is defined mathematically as below. Measured at the center point of panel by DMS-803, please refer to FIG 1

$$\textbf{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

Note4. Viewing angle is the angle at which the contrast ratio is greater than 10(CR≥10:1). The measurement instrument is DMS-803. For more information, please refer to FIG 1 and FIG 3.

Note5. CIE (x, y) chromaticity for CF only, measured with Olympus MHL-450 under C light.

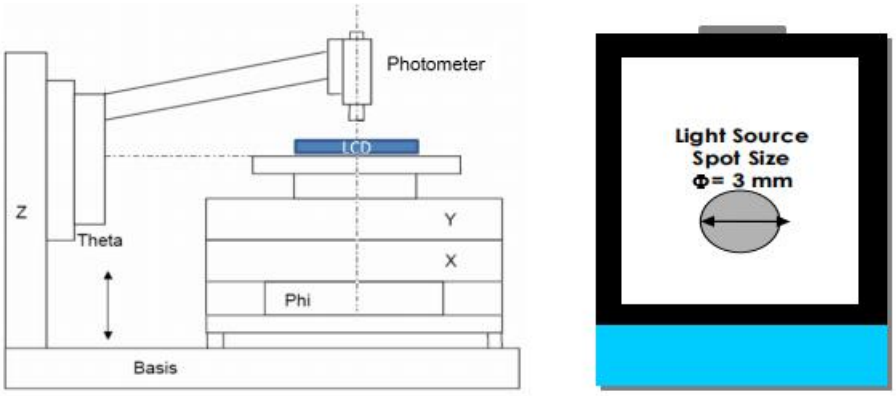


FIG. 2 The definition of Response Time

The response time is defined as the following figure and shall be measured by switching the input signal for "black" and "white". This definition is valid for a normally black display. For a normally white display the opposite definition applies.

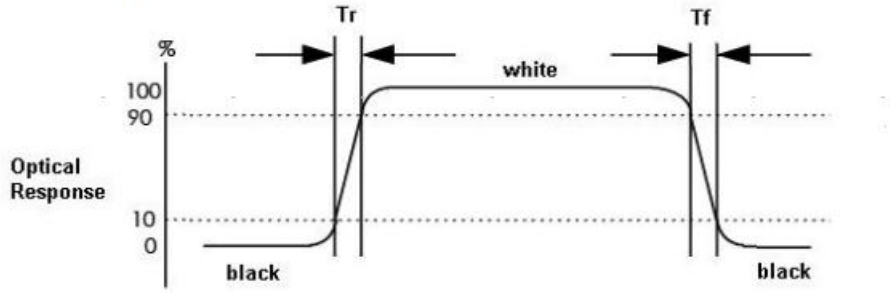
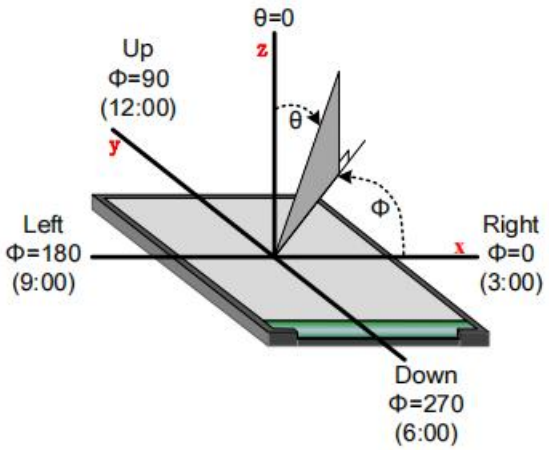
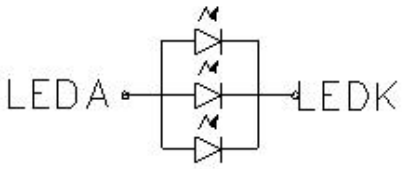


FIG. 3 The definition of viewing angle



Note(4) Backlight circuit



CIRCUIT DIAGRAM

If=60mA Vf=2.8V～3.4V

9.Records Of Version

Version	Revise Date	Page	Content
00	2024-3-30	ALL	New released