

PRODUCT SPECIFICATION **FOR LCD MODULE**

Revision: 1.0

Model No: LS020T08-M-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>

Contents

目录

1. General Description	3
2. Physical Features	3
3. Mechanical Specification	3
4. Outline Dimension	4
5. Absolute Maximum Ratings	5
6. Electrical Characteristics	5
7. Module Function Description	6
8. Electro-Optical Characteristics	10
9. Records Of Version	12

1. General Description

LS020T08-M-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 2.01 inch and the resolution is 128(RGB)*160, the panel can display up to 262k colors.

2. Physical Features

Display Mode	TFT-LCD Module
	Active matrix TFT, Transmissive type
Display Format	Graphic 128(RGB)×160 Dot-matrix
Input Data	8bit 8080
Viewing Direction (Grayscale Inversion)	TN
Drive	JD9850

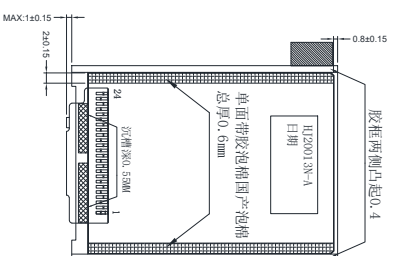
3. Mechanical Specification

Item	Specification	Unit
Module size (H×V×D)	37.68 ×51.3 ×2.8	mm
Number of dots	128(RGB) ×160	pixel
Active area (H×V)	31.87×39.84	mm

4. Outline Dimension



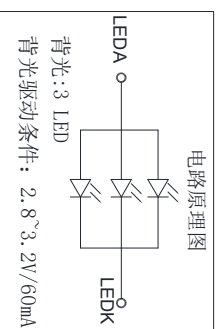
Customer No.: CUSTOMER NO.:



No.	PLN NAME
1	BLK
2	BLA
3	GD
4	VD(2,8V)
5	100C(1,8V)
6	TE
7	CS
8	RSB
9	RS
10	WB
11	RB
12	DB7
13	DB6
14	DB5
15	DB4
16	DB3
17	DB2
18	DB1
19	DB0
20	GD
21	11(GD)
22	NC
23	NC
24	NC

FPC弯折参考图

FPC展开出货



LCD型号/显示屏分辨率	TH65C / TN-QUAD(640 × 480)
操作方向	水平12点钟
亮度	0.1至0.6cd/m ² , 0.15度光亮°
驱动IC / 类型	J169S2
LCD函数/连接方式/电流	3-LAB/并联/60mA
壳底	3000×6700×3000(±0.07mm)
主色调和色温	16.4亿色, D50, 19.27K色温(白平衡值为D50)
连接器型号	

CUSTOMER APPROVE			AMEND		名称		立信（万安）智显科技有限公司			
		NO.	NAME		QTY		Part No.		WEADER & NOTE	
Mechanical	Electrical		CONTENT4	DATE4	TOLERANCE: DECIMAL		PRODUCT NO. LS020T08-M-VI		DRAW NO.	REV
			CONTENT3	DATES3	.x ± .20		DWN	CHEN	DSN	CHEN
			CONTENT2	DATE2	.xx ± .20					
			CONTENT1	DATE1	< ± 1/4°		CHKD	CHEN	APPD	LIO
		NO.	CONTENT	DATE			NOT IN SCALE		UNIT mm	SHEET: 分顶号

5. Absolute Maximum Ratings

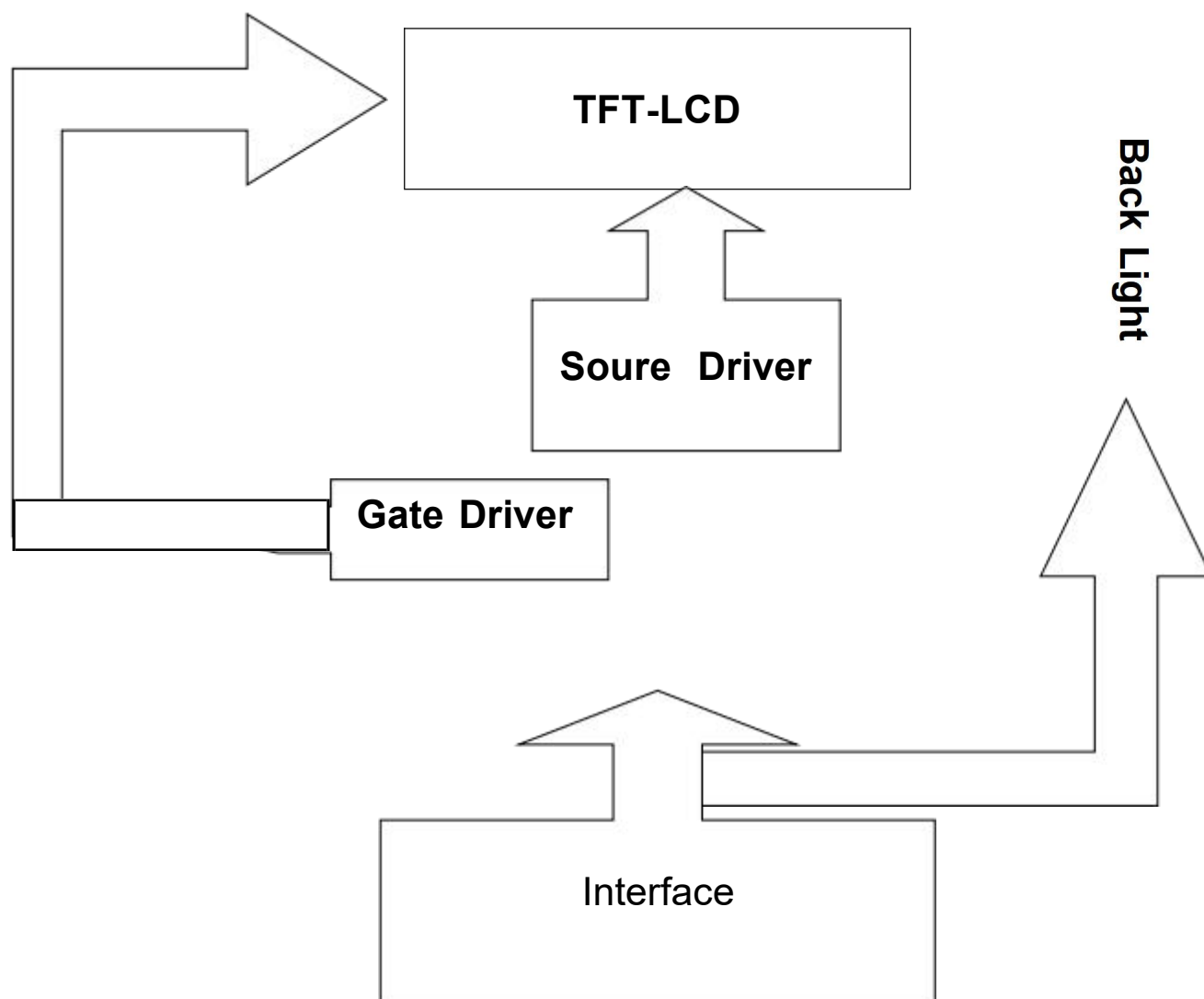
Item	Symbol	Min	Max	Unit	Remark
Supply voltage	VCC	-0.3	3.6	V	Note1 Note2
Supply voltage	IOVCC	-0.3	3.3	V	
Operating temperature	TOPR	-20	70	°C	
Storage temperature	TSTR	-30	80	°C	

6. Electrical Characteristics

Item		Symbol	Rating			Unit	Remark
			Min	Typ	Max		
Supply voltage		VCC	2.6	---	3.6	V	Note1
Supply voltage		IOVCC	1.65	---	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	BL_K	P	Power for LED backlight cathode
2	BL_A	P	Power for LED backlight anode
3	GND	P	Ground
4	VDD	P	power supply
5	IOVCC	P	power supply
6	TE	O	Tearing effect output pin to synchronize MPU to frame writing. If not used, open this pin.
7	CS	I	Chip select input pin. Low enable. High disable.
8	RETB	I	This signal will reset the device and must be applied to properly initialize the chip.
9	RS	I	-Data/command selection pin in parallel interface. When DCX='1', data is selected. When DCX='0', command is selected.
10	WR	I	Write enable in MCU parallel interface.
11	RD	I	Read enable in 6800/8080 MCU parallel interface.
12	D7	I	parallel interface data bus.
13	D6	I	parallel interface data bus.
14	D5	I	parallel interface data bus.
15	D4	I	parallel interface data bus.
16	D3	I	parallel interface data bus.
17	D2	I	parallel interface data bus.
18	D1	I	parallel interface data bus.
19	D0	I	parallel interface data bus.
20	GND	P	Ground
21	ID(GND)	P	Ground
22	NC		
23	NC		
24	NC		

10.3.5. Reset Input Timing

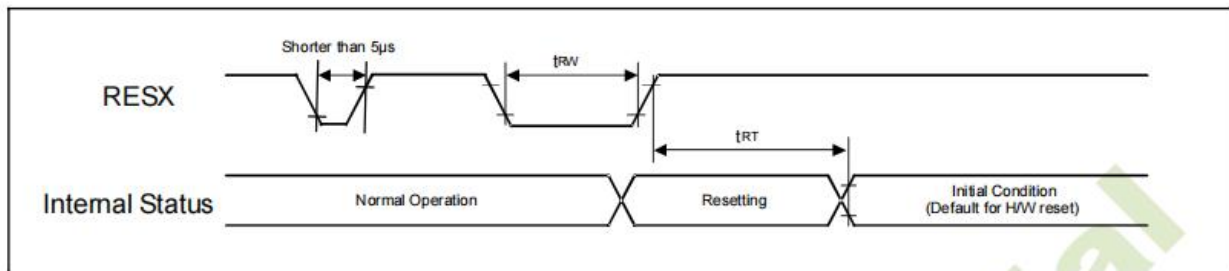


Figure. 10.6 Reset input timings

Symbol	Parameter	Related pins	Min.	Max.	Unit
t_{RW}	Reset pulse width ⁽²⁾	RESX	10	-	μs
t_{RT}	Reset complete time ⁽³⁾	-	-	5 (Note 5)	ms
		-	-	120 (Note 6, 7)	ms

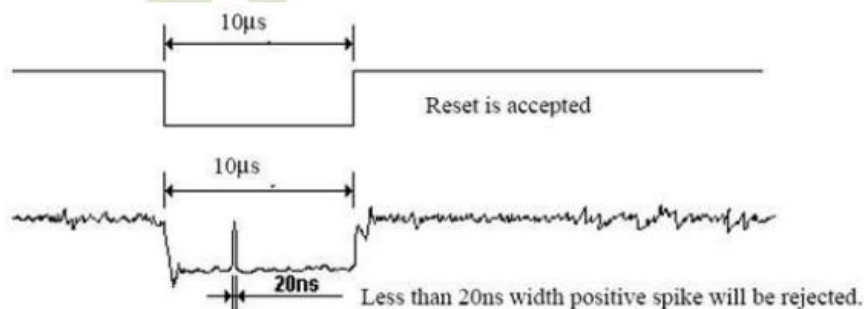
Note: (1) The reset complete time also required time for loading ID bytes from OTP to registers. This loading is done every time when there is HW reset cancel time (t_{RT}) within 5 ms after a rising edge of RESX.

(2) Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the table below.

RESX Pulse	Action
Shorter than 5 μs	Reset Rejected
Longer than 10 μs	Reset
Between 5 μs and 10 μs	Reset Start

(3) During the resetting period, the display will be blanked (The display is entering blanking sequence, which maximum time is 120 ms, when Reset Starts in Sleep Out –mode. The display remains the blank state in Sleep In –mode) and then returns to Default condition for H/W reset.

(4) Spike Rejection also applies during a valid reset pulse as shown below:



(5) When Reset is applied during Sleep In Mode.

(6) When Reset is applied during Sleep Out Mode.

(7) It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.

8. Electro-Optical Characteristics

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Response time		Tr +Tf	$\theta_x = \theta_y = 0$	---	30	40	ms	Note 1
Contrast Ratio		CR		200	400	---	---	Note 2
Transmittance		T%		5.1	6.1	---	%	
Color Chromaticity (CIE1931)	White	W x	$\theta_x = \theta_y = 0$	---	0.304	---	---	
		W y		---	0.340	---	---	
Viewing angle	θ_T		CR > 10	---	45	---	Deg.	Note 3
	θ_B			---	25	---		
	θ_L			---	45	---		
	θ_R			---	45	---		
Luminance ($I_F = 60mA$)		L		300	350	---	cd/m2	Note4

the opposite definition applies.

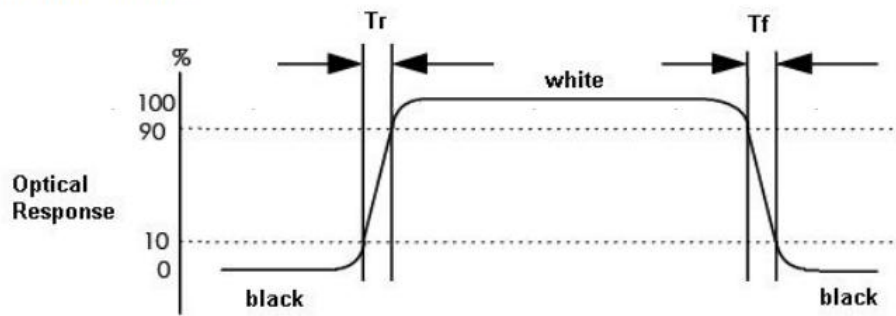
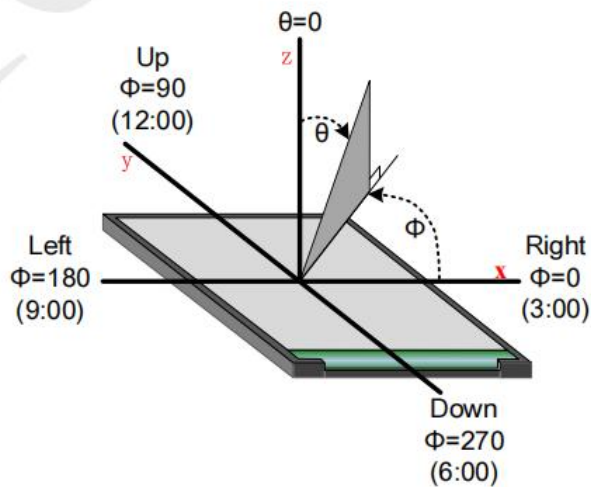
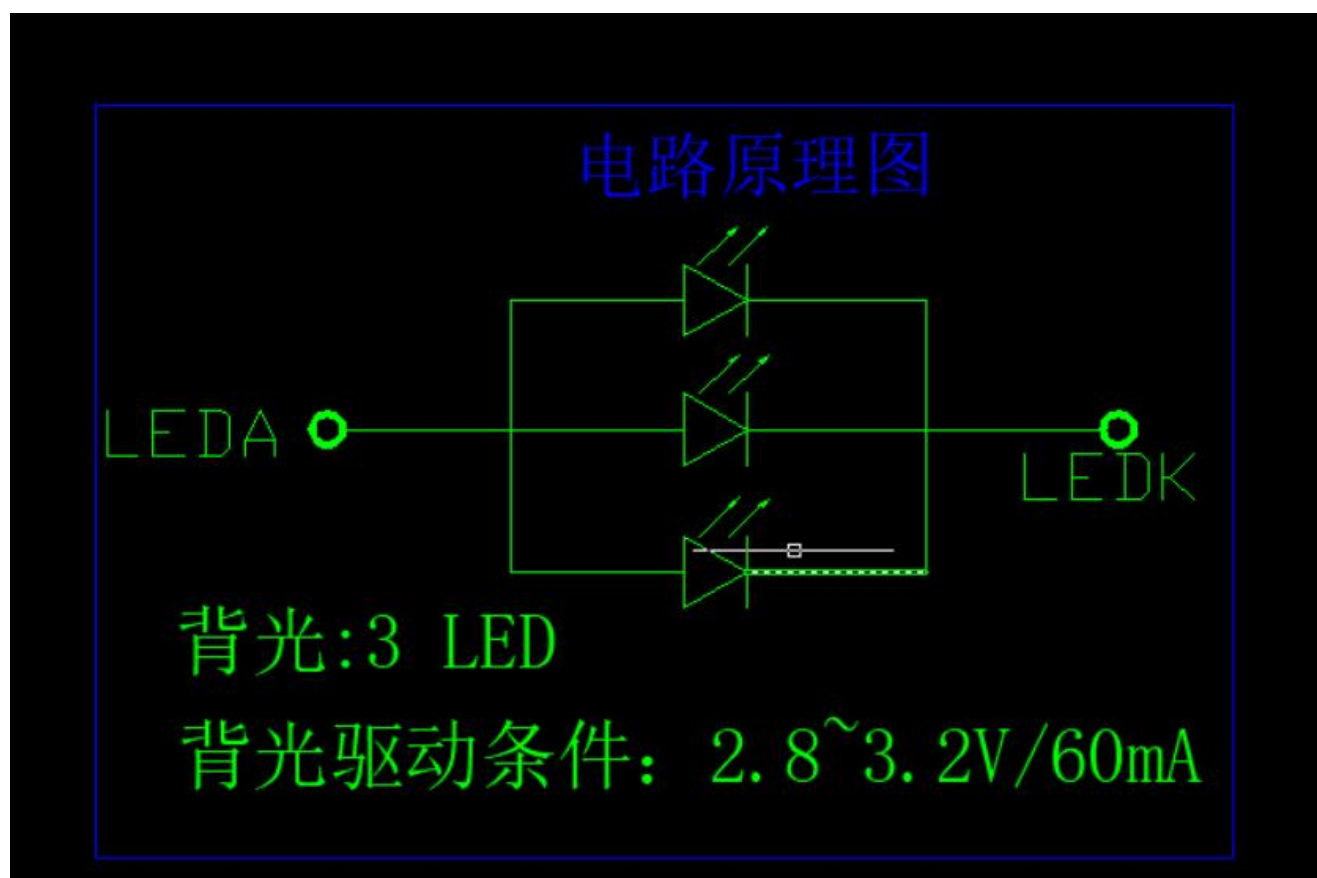


FIG. 3 The definition of viewing angle



Note(4) Backlight circuit



9.Records Of Version

Version	Revise Date	Page	Content
00	2025-3-12	ALL	New released