



深圳市茂昇电子有限公司

Shenzhen MaoSheng Electronics CO.,LTD

SPECIFICATION FOR LCD MODULE

CUSTOMER	
MODEL	MS13264HJ3A
REVISION	1.0

PREPARED	CHECKED	APPROVED

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REVISION RECORD

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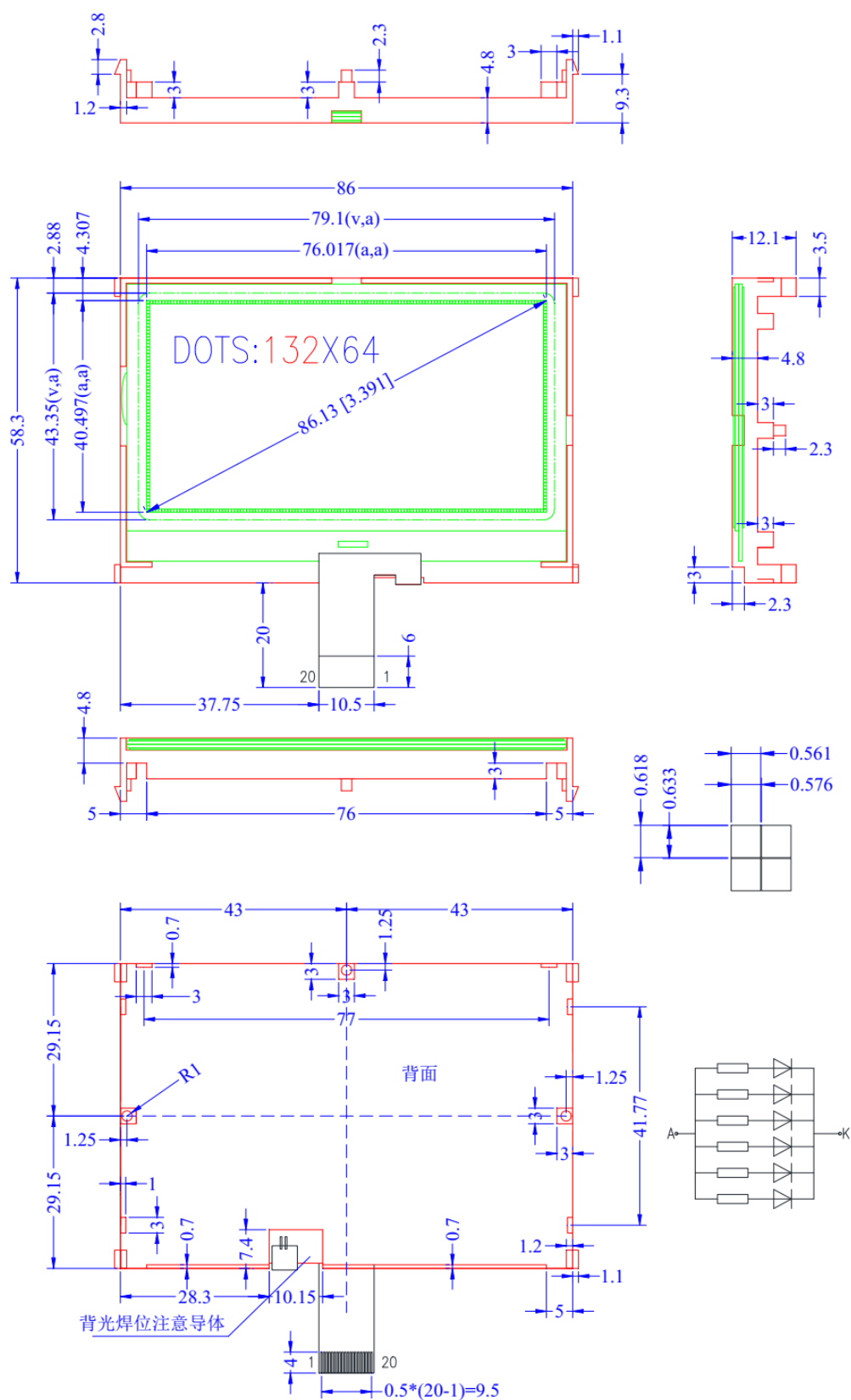


1. General Specifications

Item	Contents	Unit
LCD type	FSTN POSITIVE/NEGATIVE	-
Viewing direction	6:00	O'Clock
Module size (HXWXT)	86.0× 58.3× 12.1	mm
Viewing area (HXW)	79.1x43.35	mm
Driver IC	ST7565	-
Number of dots	132X64	-
Working voltage	3.3	V
Interface type	8080 Parallel interface	-
Operating temperature	-20 ~ 70	°C
Storage temperature	-30 ~ 80	°C



2. Dimensional Drawing



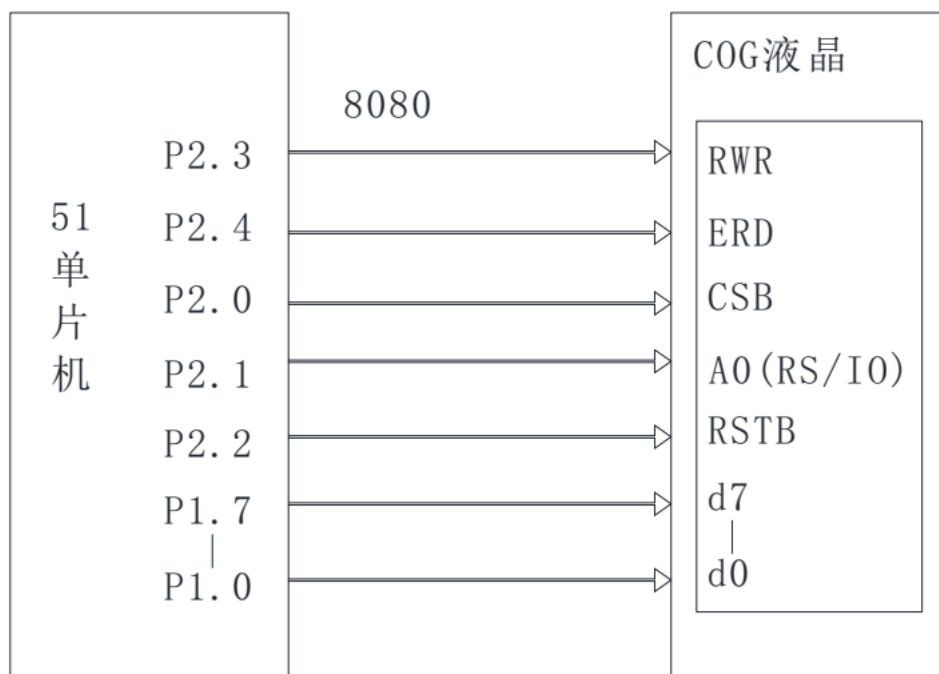


3. Interface Pin Connections

Pin	Symble	Info	Description
1	LEDK	-	Backlighr - 0V
2	LEDA	+5v	Backlight + 5.0v
3	NC	NC	NC
4	NC	NC	NC
5	CSB	I	Chip select signal input(low active)
6	RSTB	I	Reset Pin
7	A0	I	Data or command select signal input
8	/WR	I	8080 write select input
9	/RD	I	8080 read select input
10-17	DB0- DB7	I/O	DATA BUS
18	VDD	+3.3v	Power supply(+3.3V)
19	VSS	--	GND(0V)
20	V0	+10.5v	VOP of LCD 10.5V



4.Block Diagram





5. OPERATING PRINCIPLE & DRIVING METHOD

N O	指令	指令码										HEX	说明
		A0	RWR	D7	D6	D5	D4	D3	D2	D1	D0		
1	显示开/关	0	0	1	0	1	0	1	1	1	D	AF	D=1, 显示开 D=0, 显示关
2	起始行设置 (COM0)	0	0	0	1	S5	S4	S3	S2	S1	S0	40	设置显示屏第一行的位置
3	页地址设置	0	0	1	0	1	1	Y3	Y2	Y1	Y0	B0	设置页地址
4	列地址设置	0	0	0	0	0	1	X7	X6	X5	X4	10	列地址高4位 (MSB)
		0	0	0	0	0	0	X3	X2	X1	X0	00	列地址低4位 (LSB)
5	读状态	0	1	BUS Y	MX	D	RST	0	0	0	0		读出模块的IC内部工作状态
6	写数据	1	0	D7	D6	D5	D4	D3	D2	D1	D0	00	向模块内写显示数据
7	读数据	1	1	D7	D6	D5	D4	D3	D2	D1	D0	00	读出模块IC的数据
8	列方向设置 (SEG)	0	0	1	0	1	0	0	0	0	MX	A0	设置列的扫描方向 MX=1, 反方向 (右到左) MX=0, 正方向 (左到右)
9	显示方向	0	0	1	0	1	0	0	1	1	INV	A6	INV=1, 反向显示 INV=0, 正常显示
10	全部点阵打开	0	0	1	0	1	0	0	1	0	AP	A4	AP=1, 点阵全部打开 AP=0, 正常
11	偏压选择	0	0	1	0	1	0	0	0	1	BS	A2	偏压比设置 0=1/9; 1=1/7 (1/64duty)
12	Read-modify-Write	0	0	1	1	1	0	0	0	0	0	E0	Columnaddress increment: Read:+0, Write:+1
13	END	0	0	1	1	1	0	1	1	1	0	EE	Exit Read-modify-Write mode
14	复位	0	0	1	1	1	0	0	0	1	0	E2	软件复位
15	行方向 (COM)	0	0	1	1	0	0	MY	-	-	-	C0	设置行方向 MY=1, 反方向 (下到上) MY=0, 正方向 (上到下)
16	LCD电源控制	0	0	0	0	1	0	1	VB	VR	VF	28	供应LCD电压的电路控制 =1, 打开; =0, 关闭
17	Regulation Ratio	0	0	0	0	1	0	0	RR2	RR1	RR0	20	选择调节电阻比
18	LCD电压设置 (对比度)	0	0	1	0	0	0	0	0	0	1	81	双指令模式, 6位精度调节LCD 电压 (显示双比度)
		0	0	0	0	EV5	EV4	EV3	EV2	EV1	EV0	00	
19	睡眠模式设置	0	0	1	0	1	0	1	1	0	MD	AC	MD=0, 睡眠模式
		0	0	0	0	0	0	0	0	0	0	00	MD=1, 正常模式
20	省电	0	0	复合指令									显示关+全部点阵开
21	设置升压倍数 (LCD 电压)	0	0	1	1	1	1	1	0	0	0	F8	双指令模式 设置升压倍数 BL (0 0) 2倍, 3倍, 4倍 BL (0 1) 5倍 BL (1 0) 6倍
		0	0	0	0	0	0	0	0	BL1	BL0	00	
22	空指令	0	0	1	1	1	0	0	0	1	1	E3	空操作
23	测试	0	0	1	1	1	1	-	-	-	-	F0	不要使用, 保留测试



6.ABSOLUTE MAXIMUM RATINGS

Symble	condition	Data			Unit
		Min	STD	MAX	
VDD	-	3.2	3.3	3.4	V
VLED	-	3.3	5	5.2	V
VIH	-	2.2	-	VDD	V
VIL	-	-0.3	-	0.6	V
VOH	-	2.4	-	-	V
VOL	-	-	-	0.4	V
IDD	=VDD	-	-	1	MA
IDO	=VDD	-	-	10	uA
ILED	=VLED	24	90	120	MA



7. ELECTRICAL CHARACTERISTICS

VSS=0V; Tamb = -30°C to +85°C; unless otherwise specified.

Item	Symbol	Condition		Rating			Unit	Applicable Pin
				Min.	Typ.	Max.		
Operating Voltage (1)	VDD1			1.7	—	3.3	V	VDD1
Operating Voltage (2)	VDD2			2.4	—	3.3	V	VDD2
Operating Voltage (3)	VDD3			2.4	—	3.3	V	VDD3
Input High-level Voltage	V _{IHC}			0.7 x VDD1	—	VDD1	V	MPU Interface
Input Low-level Voltage	V _{ILC}			VSS1	—	0.3 x VDD1	V	MPU Interface
Output High-level Voltage	V _{OHC}	I _{OUT} =1mA, VDD1=1.8V		0.8 x VDD1	—	VDD1	V	D[7:0]
Output Low-level Voltage	V _{OLC}	I _{OUT} =-1mA, VDD1=1.8V		VSS1	—	0.2 x VDD1	V	D[7:0]
Input Leakage Current	I _{LI}			-1.0	—	1.0	μA	MPU Interface
Output Leakage Current	I _{LO}			-3.0	—	3.0	μA	MPU Interface
Liquid Crystal Driver ON Resistance	R _{ON}	Ta=25℃	Vop=8.5V, ΔV=0.85V	—	0.6	0.8	KΩ	COMx
			VG=1.9V, ΔV=0.19V	—	1.3	1.5	KΩ	SEGx
Frame Frequency	FR	Duty=1/65, Vop=8.5V Ta = 25℃		70	75	80	Hz	

Current consumption: During Display, with internal power system, current consumed by whole IC (bare die).

Test Pattern	Symbol	Condition	Rating			Unit	Note
			Min.	Typ.	Max.		
Display Pattern: SNOW (Static)	ISS	VDD1=VDD2=VDD3=3.0V, Booster X5 V _{OP} = 8.5 V, Bias=1/9 Ta=25°C	—	150	300	μA	
Display OFF	ISS	VDD1=VDD2=VDD3=3.0V, Booster X5 V _{OP} = 8.5 V, Bias=1/9 Ta=25°C	—	95	190	uA	
Power Down	ISS	VDD1=VDD2=VDD3=3.0V, Ta=25°C	—	8	16	μA	

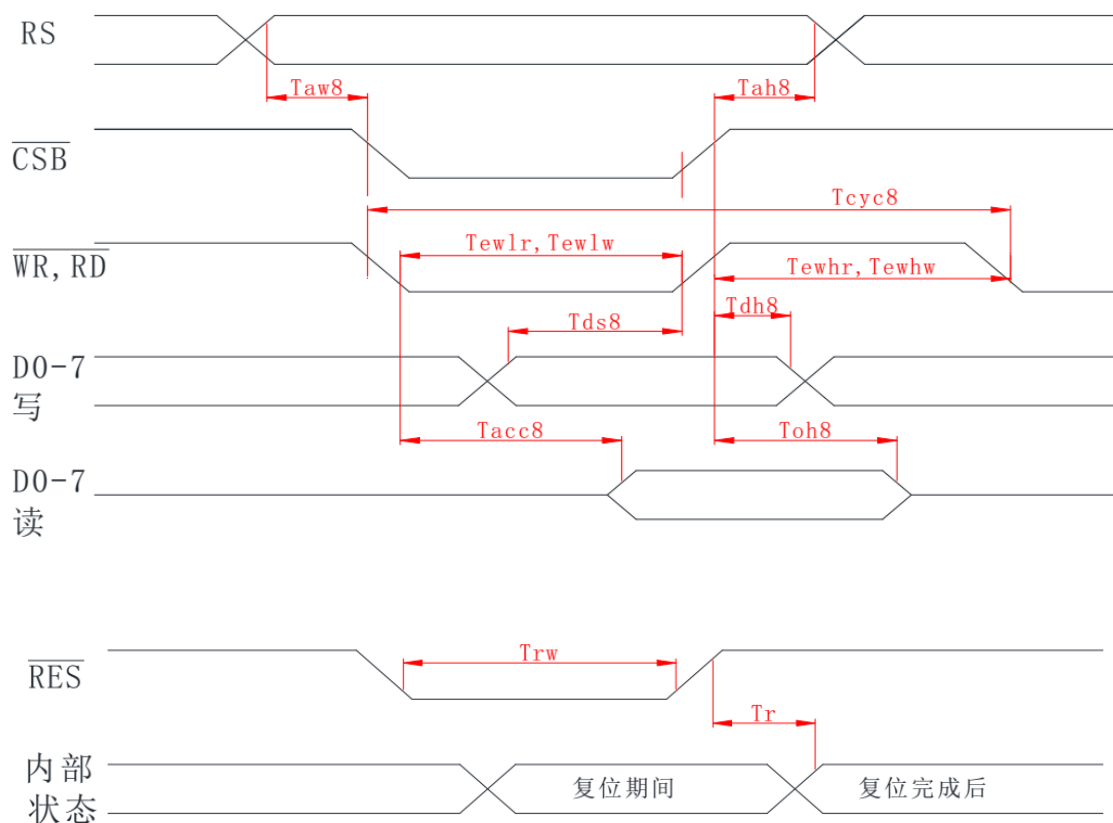
Note:

- The Current Consumption is DC characteristics



8. ELECTRO-OPTICAL CHARACTERISTICS Timing data

8080





9. Reliability

9.1. MTBF

The LCD module shall be designed to meet a minimum MTBF value of 50000 hours with normal. (25°C in the room without sunlight)

9.2. TESTS

NO.	Test Item	Test condition	Criterion
1	High Temperature Storage	80°C±2°C 96H Restore 2H at 25°C Power off	After testing, cosmetic and electrical defects should not happen.
2	Low Temperature Storage	-30°C±2°C 96H Restore 2H at 25°C Power off	
3	High Temperature Operation	70°C±2°C 96H Restore 2H at 25°C Power on	
4	Low Temperature Operation	-20°C±2°C 96H Restore 2H at 25°C Power on	
5	High Temperature & Humidity Operation	60°C±2°C 90%RH 96H Power on	
6	Temperature Cycle	-30°C↔25°C↔80°C 30min 5min 30min after 10 cycle, Restore 2H at 25°C Power off	
7	Vibration Test	10Hz~150Hz, 100m/s ² , 120min	
8	Shock Test	Half-sine wave, 300m/s ² , 11ms	1. After testing, cosmetic and electrical defects should not happen. 2. the product should remain at initial place 3. Product uncovered or package broken is not permitted.
9	Drop Test(package state)	800mm, concrete floor, 1 corner, 3 edges, 6 sides each time	



10. Precautions for Using LCD Module

10.1 handing precautions

- (1) The display panel is made of glass. Do not subject it to a mechanical shock or impact by dropping it.
- (2) If the display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance contacts your skin or clothes, wash it off using soap and water.
- (3) Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- (4) The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.
- (5) If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten a cloth with one of the following solvents:
 - Isopropyl alcohol
 - Ethyl alcohol
- (6) Solvents other than those above mentioned may damage the polarizer.
Especially, do not use the following:
 - Water
 - Ketone
 - Aromatic solvents
- (7) Extra care to minimize corrosion of the electrode. Water droplets, moisture condensation or a current flow in a high-humidity environment accelerates corrosion of the electrode.
- (8) Install the LCD Module by using the mounting holes. When mounting the LCD Module, make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.
- (9) Do not attempt to disassemble or process the LCD Module.
- (10) NC terminal should be open. Do not connect anything.
- (11) If the logic circuit power is off, do not apply the input signals.
- (12) To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

- Be sure to ground the body when handling the LCD Module.
- Tools required for assembling, such as soldering irons, must be properly grounded.
- To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions



-The LCD Module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.

10.2 storage precautions

When storing The LCD Module, avoid exposure to direct sunlight of fluorescent lamps. Keep the modules in bags (avoid high temperature/ high humidity and low temperatures below 0°C). Whenever possible, the LCD Module should be stored in the same conditions in which they were shipped from our company.

10.3 others

Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.

If the LCD Module have been operating for a long time showing the same display patterns the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be recovered by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.

To minimize the performance degradation of the LCD Module resulting from destruction caused by static electricity etc. exercise care to avoid holding the following sections when handling the modules.

- Exposed area of the printed circuit board.
- Terminal electrode sections

-END-