



# LCD Module SPECIFICATION

液晶显示模组规格书

ZX2D80N3224I-4107

## 0.Revision History (修订记录)

修订内容	时间	修订人	备注

深圳市启明智显科技有限公司

## 1.Application(应用)

This data sheet is to introduce the specification of ZX2D80N3224I-4107 active matrix 16.7M color TFT LCD module. Main color LCD module is controlled by Driver IC GC9503CV. If any problem occurs concerning the items not stated in this specification, it must be solved sincerely by both parties after deliberation. As to basic specification of driver IC refer to the IC specification and handbook.

本规格书是为了介绍 ZX2D80N3224I-4107 有源矩阵 16.7M 彩色 TFT LCD 模块的规格。主彩色液晶显示模块由驱动芯片 GC9503CV 控制 本规范未尽事宜如有问题，双方必须认真协商解决。驱动 IC 的基本规格参照《IC 规格书》和相关《手册》。

## 2.Construction and Outline (结构与大纲)

Construction: LCD panel, Driver (COG), FPC with electric components, 8 White LED lump, prism sheet, diffuser, light guide and reflector, plastic frame to fix them mechanically. There shall be no scratches, stains, chips, distortions, and other external drawbacks that may affect the display function. To realize thin module structure, double-sided adhesive tapes are used to fix LCD panels. As these tapes do not guarantee to permanently fix the panels, LCD panel may rise from the module when shipped from factory. So please make sure to design the system to hold the edges of LCD panel by the soft material such as sponge when LCD module is assembled into the cabinet.

结构:液晶面板，驱动或 COG，带电子元件的 FPC，8 个白光 LED 块，棱镜片，扩散器，导光器和反射器，塑料框架机械固定。不应有可能影响显示功能的划痕、污迹、芯片、畸变等外部缺陷。为了实现薄型模块结构，采用双面胶带固定液晶面板。由于这些胶带不能保证永久有效固定面板，LCD 面板在出厂时可能会从模块内移动。所以在液晶模块组包装和进柜时，请务必将包装设计成用海绵等软材料支撑液晶面板的边缘。

### 3. Mechanical Specification(参数规格) Table 1(表 1)

Item(项目)	Specifications(规格)	Unit(单位)
LCK Type	TFT TRANSMISSIVE Normally White	
Viewing direction	12 O'CLOCK	-
Display Colors	262K	
Module outline (W*H*D)	50*69.2*2.3	mm
Active area(W*H)	43.2*57.6	mm
Number of Dots	240*RGB*320	
Pixel Pitch	0.06(H)X0.18(V)	mm
Backlight Type	Paralle	
Interface Type	MCU 或者 SPI	
Input voltage	2.8	v

Note 1: Not include FPCs & Bezel extrude structure.

备注 1: 不包括排线和面板构造



5. Interface signals(接口信号)Table 2(表 2)

Pin No	Symbol	Description
1	MI0	MI0=0 select MCU8BIT,MI0=1 select SPI4W,
2	GND	Ground
3	VDD	Power supply
4	IOVCC	Power supply
5	GND	Ground
6	GND	Ground
7	DB0	Data
8	DB1	Data
9	DB2	Data
10	DB3	Data
11	DB4	Data
12	DB5	Data
13	DB6	Data
14	DB7	Data
15	RD	Read enable in 8080 MCU parallel interface
16	WR	Write enable in MCU parallel interface.
17	RS	commandselectionpininparalleinterface
18	CS	Chipselectionpinlow:enablehigh:disable
19	SDI	SPI model Serial input/output data
20	LCD-ID	LCD-ID=1 Is the IPS LCD,LCD-ID=0 Is the TN LCD,
21	TE	Synchronous clock signal

## 6. ELECTRICAL CHARACTERISTICS(电气特征)

### 6.1 ABSOLUTE MAXIMUM RATINGS (绝对最大额定值) Table 3(表 3)

Item	Symbol	Rating	Unit
Supply Voltage	VDD	- 0.3 ~ +4.6	V
Supply Voltage (Logic)	VDDI	- 0.3 ~ +4.6	V
Driver Supply Voltage	VGH-VGL	-0.3 ~ +30.0	V
Logic Input Voltage Range	VIN	-0.3 ~ VDDI + 0.5	V
Logic Output Voltage Range	VO	-0.3 ~ VDDI + 0.5	V
Operating Temperature Range	TOPR	-20 ~ +70	°C
Storage Temperature Range	TOPR	-20 ~ +70	°C

### 6.2 DC characteristics

Parameter	Symbol	Condition	Specification			Unit	Related Pins
			MIN.	TYP.	MAX.		
Power & Operation Voltage							
System Voltage	VDD	Operating voltage	2.4	2.75	3.3	V	
Interface Operation Voltage	VDDI	I/O Supply Voltage	1.65	1.8	3.3	V	
Gate Driver High Voltage	VGH		12.2		14.97	V	Note 4
Gate Driver Low Voltage	VGL		-12.5		-7.16	V	
Gate Driver Supply Voltage		VGH-VGL	19.36		27.47	V	Note 5
Input / Output							
Logic-High Input Voltage	VIH		0.7VDDI		VDDI	V	Note 1
Logic-Low Input Voltage	VIL		VSS		0.3VDDI	V	Note 1
Logic-High Output Voltage	VOH	IOH = -1.0mA	0.8VDDI		VDDI	V	Note 1
Logic-Low Output Voltage	VOL	IOL = +1.0mA	VSS		0.2VDDI	V	Note 1
Logic-High Input Current	I <sub>IH</sub>	VIN = VDDI			1	uA	Note 1
Logic-Low Input Current	I <sub>IL</sub>	VIN = VSS	-1			uA	Note 1
Input Leakage Current	I <sub>IL</sub>	IOH = -1.0mA	-0.1		+0.1	uA	Note 1

		VCOM Voltage					
VCOM amplitude	VCOM			VSS		V	
		Source Driver					
Source Output Range	Vsout		VAN		VAP	V	
Gamma Reference Voltage(Positive)	VAP		4.45		6.4	V	Note 6
Gamma Reference Voltage(Negative)	VAN		-4.6		-2.65	V	
Source Output Settling Time	Tr	Below with 99% precision			20	us	Note 2
Output Offset Voltage	VOFFSET				35	mV	Note 3

### 6.3 Backlight Characteristics

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward voltage	Fv		3.2		V	
Luminance	Lv		250		Cd/m <sup>2</sup>	
Driver Supply Voltage			4		Piece	
Connection mode	P		Parallel			



## 7. LED back light(背光灯) Table 6(表 6)

At main panel the back light uses 8 pcs edge light type white LED. 在背光的主面板用 8 颗白色 LED 灯

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED Voltage	VLED	10.8	-	13.6	V	[Note 5-2]
LED Current	ILED	40	-	40	mA	
Power Consumption	WLED	432	-	544	mW	[Note 5-2]
Number of LED components		8			PCS	
Connection Type		4*2 pcs LEDs				

**Note:**

\*8 pcs of LED

\*Please consider Allowable Forward Current on used temperature \*8 颗灯

\* 请考虑允许范围内的正向电流的使用温度

■ Ambient Temperature vs. Allowable Forward Current

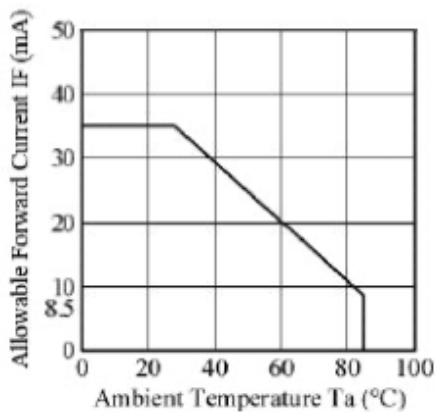


Fig.2 (图 2)

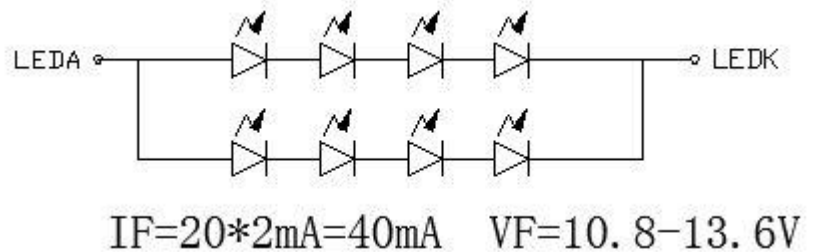


Fig.3\*Schematics drawing of lighting (绘制照明图 图.3)

Note: Logic high and low levels are specified as 30% and 70% of IOVCC for Input signals.

Note: Ta = -30 to 70 ° C, IOVCC=1.65V to 3.3V, VCI=2.5V to 3.3V, GND=0V

备注: 指定逻辑高和低电平作为输入信号 IOVCC 的 70%和 30%。

备注: Ta = -30 to 70 ° C, IOVCC=1.65V to 3.3V, VCI=2.5V to 3.3V, GND=0V

## 8. Optical Characteristics(光学特征) Table 7(表 7)

Item	Symbol	Condition	Specification			Unit	Remark
			Min.	Typ.	Max.		
Response time (By Quick)	Tr+Tf	$\theta = 0^\circ$	-	16		ms	Note 5
Contrast ratio	CR	$\theta = 0^\circ$	-	500	-		Note 2,6
Viewing angle	Top	$CR \geq 10$	-	50	-	deg.	Note 2,6,7
	Bottom	$CR \geq 10$	-	20	-		
	Left	$CR \geq 10$	-	45	-		
	Right	$CR \geq 10$	-	45	-		
Color chromaticity (CF only with ITO, light source is C light, CIE 1931)	Wx	$\theta = 0^\circ$	TYP-0.03	TBD	TYP+0.03		Note 3
	Wy						
	Rx						
	Ry						
	Gx						
	Gy						
	Bx						
By							
NTSC			-	55	-	%	Note 3
Transmittance	Trans		-	6.4	-	%	Note 9

Note 1: Ambient temperature = 25°C.

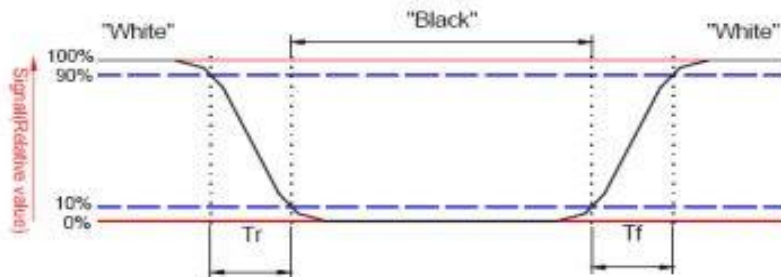
Note 2: To be measured with a viewing cone of 2° by Topcon luminance meter BM-5A.

Note 3: To be measured with Otsuta chromaticity meter LCF-2100M, CF only measure under C light simulation.

Note 4: CTC shipping status is cell without polarizer. Transmittance of Specification is cell with polarizer. The tolerance of Transmittance is  $\pm 10\%$ .

Note 5: Definition of response time:

The output signals of TRD-100 are measured when the input signals are changed to "White" (falling time) and from "White" to "Black" (rising time), respectively. The interval is between the 10% and 90% of amplitudes. Refer to figure as below.



## 9. Packaging Specification(包装规格)

- 1.1) Package quantity in one box: 36PCS
- 1.2) Box Size: 380cm\*330cm\*210cm
- 1.3) One BOX = 1 CARTON
- 1.4) One CARTON = 9(Full tray) + 1 (dummy / top tray) =10 tray
- 1.5) One TRAY=4PCSLCM

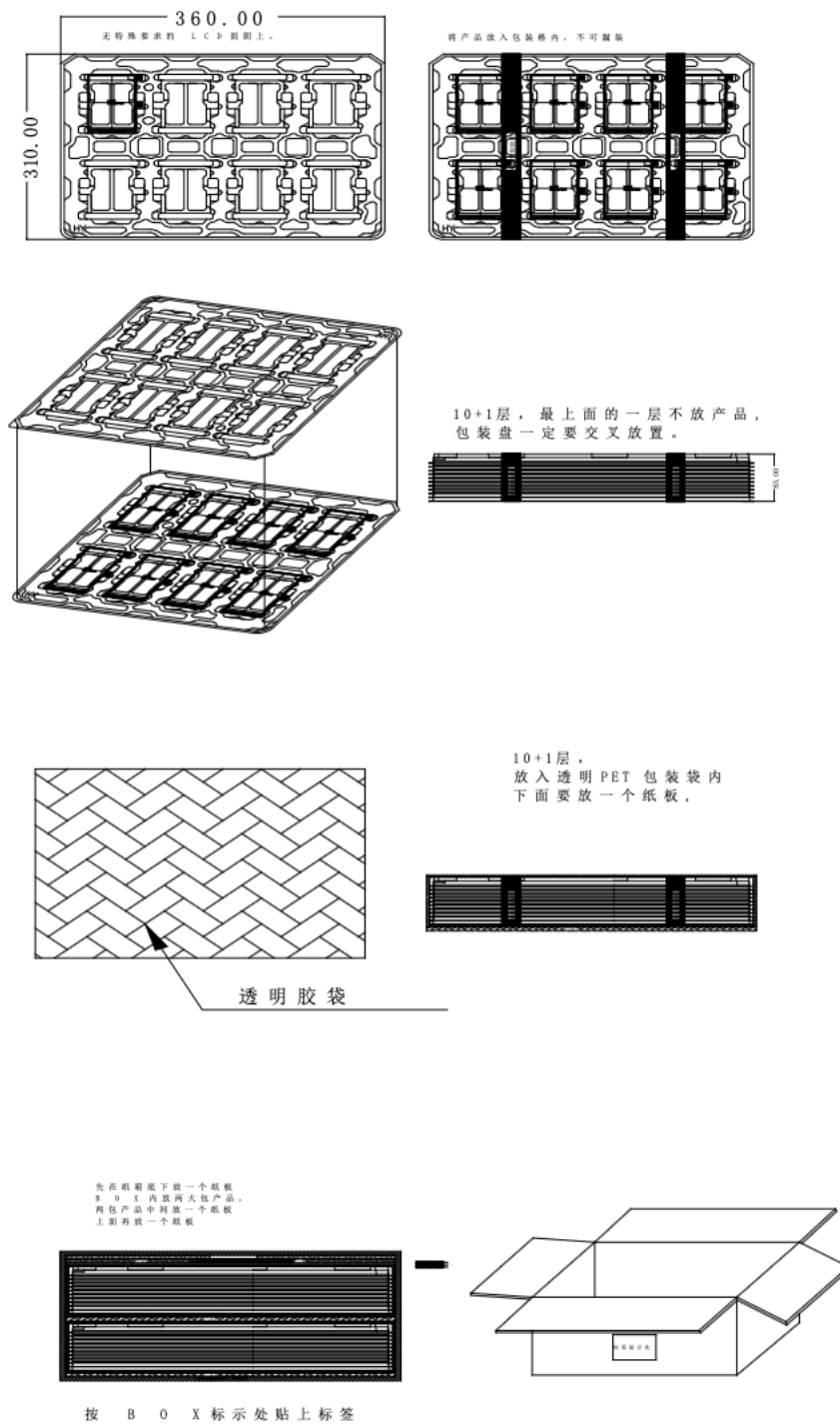


Fig.4 (图 4)

## 10. General Precaution (一般注意事项)

### 10.1 Safety

1. Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
2. If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
3. If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

### 8.2 Storage Conditions

1. Store the panel or module in a dark place where the temperature is  $23 \pm 5^{\circ} \text{C}$  and The humidity is below  $50 \pm 20\% \text{RH}$ .
2. Store in anti-static electricity container.
3. Store in clean environment, free from dust, active gas, and solvent.
4. Do not place the module near organics solvents or corrosive gases.
5. Do not crush, shake, or jolt the module.

### 8.3 Handling Precautions

1. Avoid static electricity which can damage the CMOS LSI.
2. The polarizing plate of the display is very fragile. So, please handle it very carefully.
3. Do not give external shock.
4. Do not apply excessive force on the surface.
5. Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
6. Do not use ketonic solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
7. Do not operate it above the absolute maximum rating.
8. Do not remove the panel or frame from the module.
9. When the module is assembled, it should be attached to the system firmly, be careful not to twist and bend the module.
10. Wipe off water droplets or oil immediately. If you leave the droplets for a long time, staining and discoloration may occur.
11. If the liquid crystal material leaks from the panel, it should be kept away from the eye so mouth in case of contact with hands, legs or clothes, it must be head way thoroughly with soap.

### 8.4 Warranty

1. The period is within twelve months since the date of shipping out under normal using and storage conditions.
2. Do not repaired or modified the LCM. It may cause function to lose efficacy, Starry does not warrant the LCM.
3. All process and material comply ROHS.

## 11. Contact information (联系信息)

深圳市启明智显科技有限公司