



LCD Module SPECIFICATION

液晶显示模组规格书

ZX3D50C3248RD024

深圳市启明显示技术有限公司

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 ZX3D50C3248RD024 active matrix 16.7M color TFT LCD module. Main color LCD module is controlled by Driver IC ST7796U. 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 ZX3D50C3248RD024 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 ST7796U 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, 6 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，6 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。

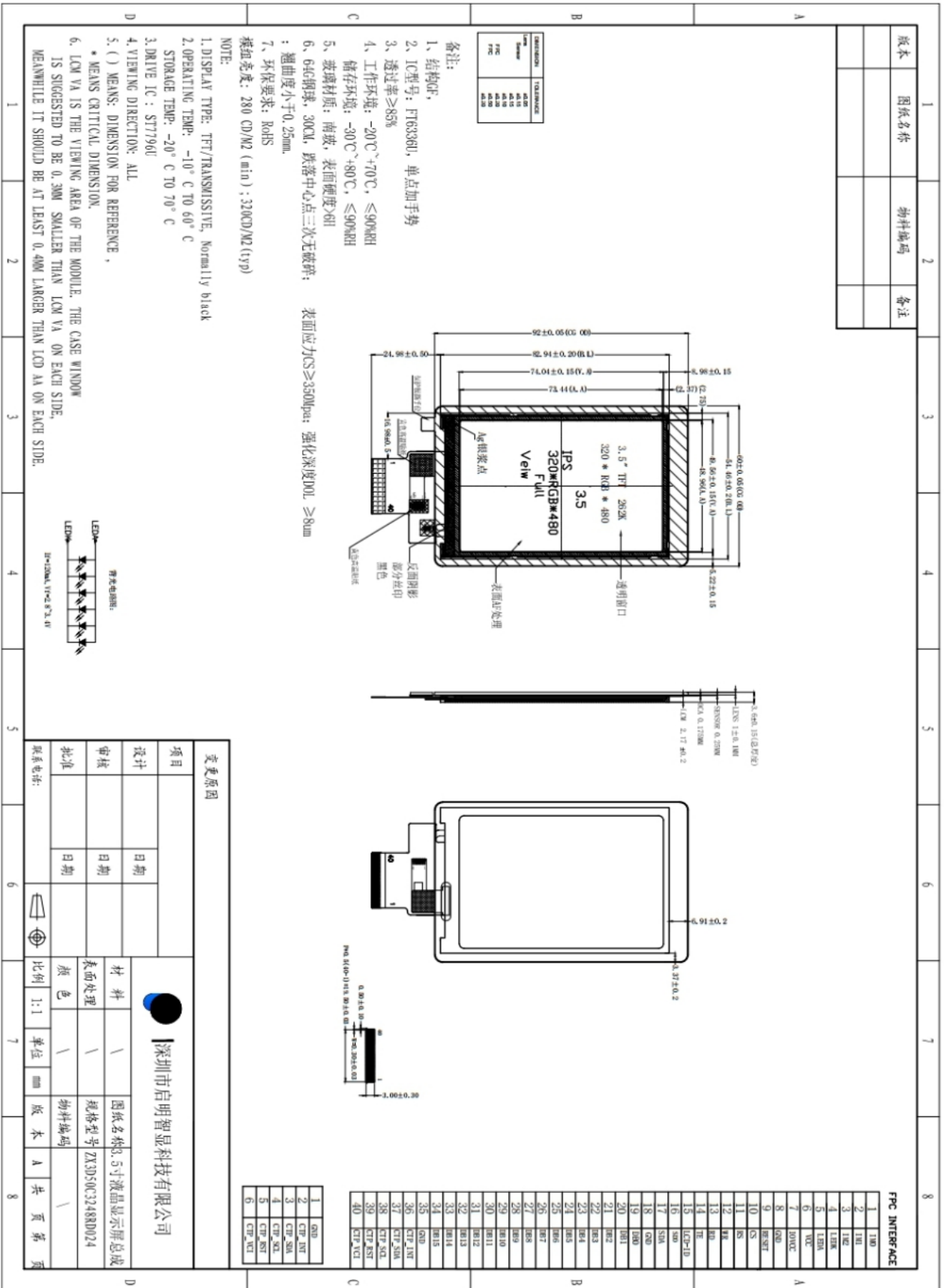
3. Mechanical Specification (参数规格) Table 1 (表 1)

| Item(项目) | Specifications(规格) | Unit(单位) |
|--------------------------|---------------------------|----------|
| Screen size(屏幕尺寸) | 3.5 | inch |
| Display mode(显示模式) | Normally Black | - |
| Active area(显示范围) | 48.96 (H) X 73.44 (V) | mm |
| Display format(分辨率) | 320 (H)* RGB x 480 (V) | - |
| Pixel configuration(像素) | 0.1497(H)*RGB*0.1462(V) | mm |
| Outline Dimensions(外形尺寸) | 60*92*3.75 (不含 FPC 及焊锡厚度) | Note 1 |
| View Angle(视角) | FULL | |
| Base color Notes(基色) | Black | - |
| Weight(重量) | TBD | |
| Driver IC(驱动 IC) | ST7796U | |

Note 1: Not include FPCs & Bezel extrude structure.

备注 1: 不包括排线和面板构造

4. LCD Module Outline dimensions (模组外形图)



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

| Pin No. | Symbol | Description | Remark |
|---------|----------|---|--------|
| 1-3 | IM0-IM2 | The MCU interface mode select. | |
| 4 | LEDK | LED1+ | |
| 5 | LEDA | LED1- | |
| 6 | VCC | Power supply voltage | |
| 7 | IOVCC | Power supply voltage | |
| 8 | GND | GROUND | |
| 9 | RESET | Reset Signal Input Pin | |
| 10 | CS | Chip selection Low enable. | |
| 11 | RS | Display data/command selection pin | |
| 12 | WR | Write enable in MCU parallel interface. | |
| 13 | RD | Power supply voltage | |
| 14 | TE | Tearing effect signal | |
| 15 | LCD-ID | ID check. | |
| 16 | SDO | SPI interface output pin. | |
| 17 | SDA | Serial Data Transport Interface | |
| 18 | GND | GROUND | |
| 19-34 | DB0-DB15 | 16bit data bus | |
| 35 | GND | GROUND | |
| 36 | CTP_INT | Touch panel interrupt output | |
| 37 | CTP_SDA | Touch panel I2C data | |
| 38 | CTP_SCL | Touch panel I2C clock | |
| 39 | CTP_RST | Touch panel reset | |
| 40 | CTP_VCI | Touch panel power supply | |

6. ELECTRICAL CHARACTERISTICS (电气特征)

6.1 ABSOLUTE MAXIMUM RATINGS (极限参数) Table 3(表 3)

| Parameter of absolute maximum ratings 参数 | Symbol 符号 | Min 最小值 | Max 最大值 | Unit 单位 | Remark 备注 |
|--|-----------|---------|--------------|---------|-----------|
| Operating temperature 操作温度 | Top | -10 | 60 | °C | |
| Storage temperature 储存温度 | Tst | -20 | 70 | °C | |
| Humidity 湿度 | RH | / | 90%(Max60°C) | RH | |
| Power Voltage 电源电压 | VDD | -0.3 | +6.0 | V | |
| | VDDIO | | | | |

6.2 ELECTRICAL CHARACTERISTICS (模块电气特性) Table 4(表 4)

| Parameter of DC characteristics 参数 | Symbol 符号 | Min 最小值 | Typ 典型值 | Max 最大值 | Unit 单位 |
|------------------------------------|-----------------|-----------|---------|-----------|---------|
| Supply voltage for logic 逻辑电压 | VDD | 2.5 | 2.75 | 3.3 | V |
| I/O power supply I/O 口电压 | VDDIO | 1.65 | 1.8 | 3.3 | V |
| Input Current 输入电流 | I _{dd} | - | TBD | - | mA |
| Input voltage 'H' level 输入高电平 | V _{IH} | 0.7*VDDIO | - | VDDIO | V |
| Input voltage 'L' level 输入低电平 | V _{IL} | 0 | - | 0.3*VDDIO | V |
| Output voltage 'H' level 输出高电平 | V _{OH} | 0.8*VDDIO | - | VDDIO | V |
| Output voltage 'L' level 输出低电平 | V _{OL} | 0 | - | 0.2*VDDIO | V |

6.3 BACKLIGHT SPECIFICATION(背光电气特性) Table 5(表 5)

| Item of backlight characteristics 项目 | Symbol 符号 | Min 最小值 | Typ 典型值 | Max 最大值 | Unit 单位 | Condition 条件 |
|--------------------------------------|----------------------------|---------|---------|---------|-------------------|--------------|
| Forward voltage 正向电压 | Vf | 2.8 | 3.0 | 3.4 | V | If = 6*20mA |
| Luminance 亮度 | Lv | - | - | - | cd/m ² | If = 120mA |
| Backlight uniformity 均匀度 | No less than 80% (不低于 80%) | | | | | |
| Number of LED LED 数量 | - | 6 | | | Piece | |
| Connection mode 连接模式 | S/P/M | 6P | | | - | |

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

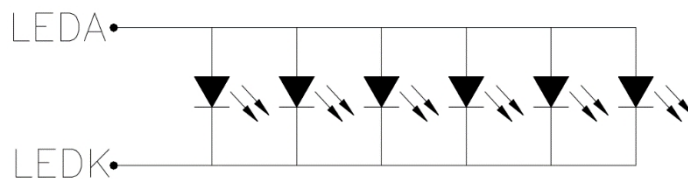
| Parameter of DC characteristics 参数 | Symbol 符号 | Min 最小值 | Typ 典型值 | Max 最大值 | Unit 单位 |
|------------------------------------|-----------------|-----------|---------|-----------|---------|
| Supply voltage for logic | VDD | 2.5 | 2.75 | 3.3 | V |
| I/O power supply | VDDIO | 1.65 | 1.8 | 3.3 | V |
| Input Current | I _{dd} | - | TBD | - | mA |
| Input voltage 'H' level 输入高电平 | V _{IH} | 0.7*VDDIO | - | VDDIO | V |
| Input voltage 'L' level 输入低电平 | V _{IL} | 0 | - | 0.3*VDDIO | V |
| Output voltage 'H' level 输出高电平 | V _{OH} | 0.8*VDDIO | - | VDDIO | V |
| Output voltage 'L' level 输出低电平 | V _{OL} | 0 | - | 0.2*VDDIO | V |

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



$$I_f=120\text{mA}, V_f=2.8\sim 3.4\text{V}$$

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

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

| Item of electro-optical characteristics 项目 | | Symbol 符号 | Condition 条件 | Min 最小值 | Typ 典型值 | Max 最大值 | Unit 单位 | Note 备注 |
|--|-------|-------------|--|---------|---------|---------|-------------------|------------------|
| LCM Surface Luminance 模组表面亮度 | | Lv | -- | 280 | 320 | -- | cd/m ² | Note 4 |
| Contrast Ratio 对比度 | | CR | -- | 800 | 1000 | -- | -- | Note 2 |
| Response time 响应时间 | | Tr+Tf | -- | -- | 25 | 35 | msec | Note 3 |
| Color chromaticity (CIE 1931) 色彩饱和度 | White | X | $\theta = 0^\circ$ $\varnothing = 0^\circ$ $T_a = 25^\circ \text{C}$ | -0.03 | 0.292 | +0.03 | | Note 4 Note 5 |
| | | Y | | | 0.316 | | | |
| | Red | X | | | 0.632 | | | |
| | | Y | | | 0.339 | | | |
| | Green | X | | | 0.309 | | | |
| | | Y | | | 0.608 | | | |
| | Blue | X | | | 0.147 | | | |
| | | Y | | | 0.042 | | | |
| Viewing angle 视角范围 | Ver. | $\theta Y+$ | $CR \geq 10$ | 80 | 85 | -- | deg | Note 1 |
| | | $\theta Y-$ | | 80 | 85 | -- | | |
| | Hor. | $\theta X-$ | | 80 | 85 | -- | | |
| | | $\theta X+$ | | 80 | 85 | -- | | |

9. General Precaution (一般注意事项)

9.1 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.

9.2 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.

9.3 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.

9.4 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.

10. Contact information (联系信息)

网址: [http://www. panel-tag.cn/](http://www.panel-tag.cn/)

联系邮箱: panlee@smartpanle.com

样品购买地址: <https://shop212317088.taobao.com/>

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