# 中景园电子技术有限公司

MODEL NO(不带触摸产品型号）:ZJY240L-C18N　　MODEL NO(不带触摸产品型号）:ZJY240L-C18T

# 2.4 inch LCD TFT

（2.4 英寸真彩色液晶显示屏）

# 240RGBx320 Resolution and 65K color

（240x320 分辨率，6 万 5 千种色）

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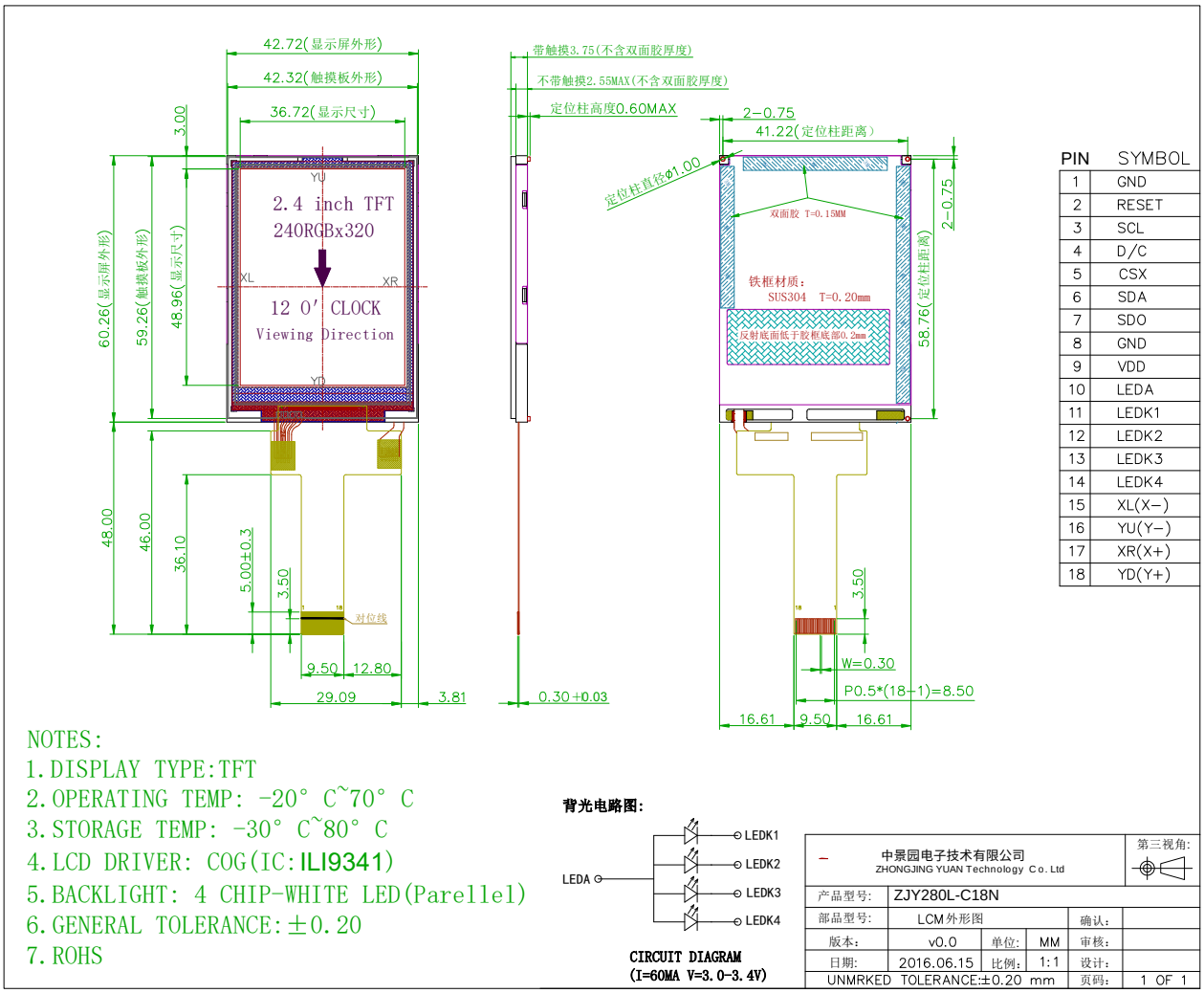
## 1.General Description 基本描述

| | |
|---|---|
| **MODEL NO**<br>产品型号 | **YT240L030** |
| Display Mode<br>显示模式 | Transmissive 全透 |
| Display Format<br>显示格式 | Graphic 240RGB*320 Dot-matrix 240xRGBx320 图形点阵 |
| Input Data<br>显示屏接口类型 | 4 Line-SPI interface 4 线-SPI 串口 |
| Viewing Direction<br>视角方向 | 12 o'clock 12 点钟 |
| Drive<br>显示屏驱动芯片 | ILI9341 (台湾奕力) |

## 2. Mechanical Specification 机械规格

| Item | Specifications | Unit |
|---|---|---|
| Dimensional outline<br>显示屏外围尺寸 | 42.72(W)*60.26(H)*2.55(T)（不带触摸）<br>42.72(W)*60.26(H)*3.75(T)（带触摸）<br>(FPC not include) | mm |
| Resolution<br>分辨率 | 240RGB*320 | dots |
| LCD Active area<br>显示尺寸 | 36.72(W)*48.96 (H) | mm |
| Pixel size<br>像素尺寸 | 0.153(W)*0.153(H) | mm |

## 3.Mechanical Dimension 机械尺寸图




| PIN | SYMBOL |
|---|---|
| 1 | GND |
| 2 | RESET |
| 3 | SCL |
| 4 | D/C |
| 5 | CSX |
| 6 | SDA |
| 7 | SDO |
| 8 | GND |
| 9 | VDD |
| 10 | LEDA |
| 11 | LEDK1 |
| 12 | LEDK2 |
| 13 | LEDK3 |
| 14 | LEDK4 |
| 15 | XL(X-) |
| 16 | YU(Y-) |
| 17 | XR(X+) |
| 18 | YD(Y+) |

NOTES:
1. DISPLAY TYPE:TFT
2. OPERATING TEMP: -20° C~70° C
3. STORAGE TEMP: -30° C~80° C
4. LCD DRIVER: COG(IC:ILI9341)
5. BACKLIGHT: 4 CHIP-WHITE LED(Parellel)
6. GENERAL TOLERANCE:±0.20
7. ROHS

背光电路图:




CIRCUIT DIAGRAM
(I=60MA V=3.0-3.4V)

| | | | | | |
|---|---|---|---|---|---|
| 中景园电子技术有限公司 ZHONGJING YUAN Technology Co.Ltd | | | | | 第三视角: |
| 产品型号: | ZJY280L-C18N | | | | |
| 部品型号: | LCM外形图 | | | 确认: | |
| 版本: | v0.0 | 单位: | MM | 审核: | |
| 日期: | 2016.06.15 | 比例: | 1:1 | 设计: | |
| UNMRKED TOLERANCE:±0.20 mm | | | | 页码: | 1 OF 1 |

## 4. Electrical Maximum Ratings 电气极限

| Item<br>项目 | Symbol<br>符号 | Min<br>最小值 | Max<br>最大值 | Unit<br>单位 | Note<br>备注 |
|---|---|---|---|---|---|
| Supply voltage（VDDI）<br>工作电压(VDDI) | V | 1.8 | 3.3 | V | - |
| Supply voltage（VDD）<br>工作电压(VDD) | V | 2.8 | 3.3 | V | - |
| Operating temperature 工作温度范围 | $T_{OPR}$ | -20 | 70 | ℃ | - |
| Storage temperature<br>存储温度范围 | $T_{STR}$ | -30 | 80 | ℃ | - |

※NOTE: VDDI 和 VDD 可以直接连一起，共用一组（2.8V~3.3V）电压供电。

## 5. Brightness characteristic&Power dissipation 亮度特性&功耗

| Item<br>项目 | Symbol<br>符号 | Min<br>最小值 | Typical<br>典型值 | Max<br>最大值 | Unit |
|---|---|---|---|---|---|
| LED module Forward voltage<br>LED 背光源正向电压 | $V_{LED}$ | 2．9 | 3.1 | 3.3 | V |
| LED module current<br>LED 背光源电流 | $I_{LED}$ | - | 60 | - | mA |
| LCD Surface Luminance<br>显示屏表面亮度 | $L_S$ | 550 | 600 | - | Cd/m |
| LCM Surface brightness uniform<br>LED 背光源均匀度 | $L_D$ | 80 | - | - | % |
| LCD power dissipation<br>显示屏总功耗 | $P_{LCD}$ | - | 0.22 | - | W |

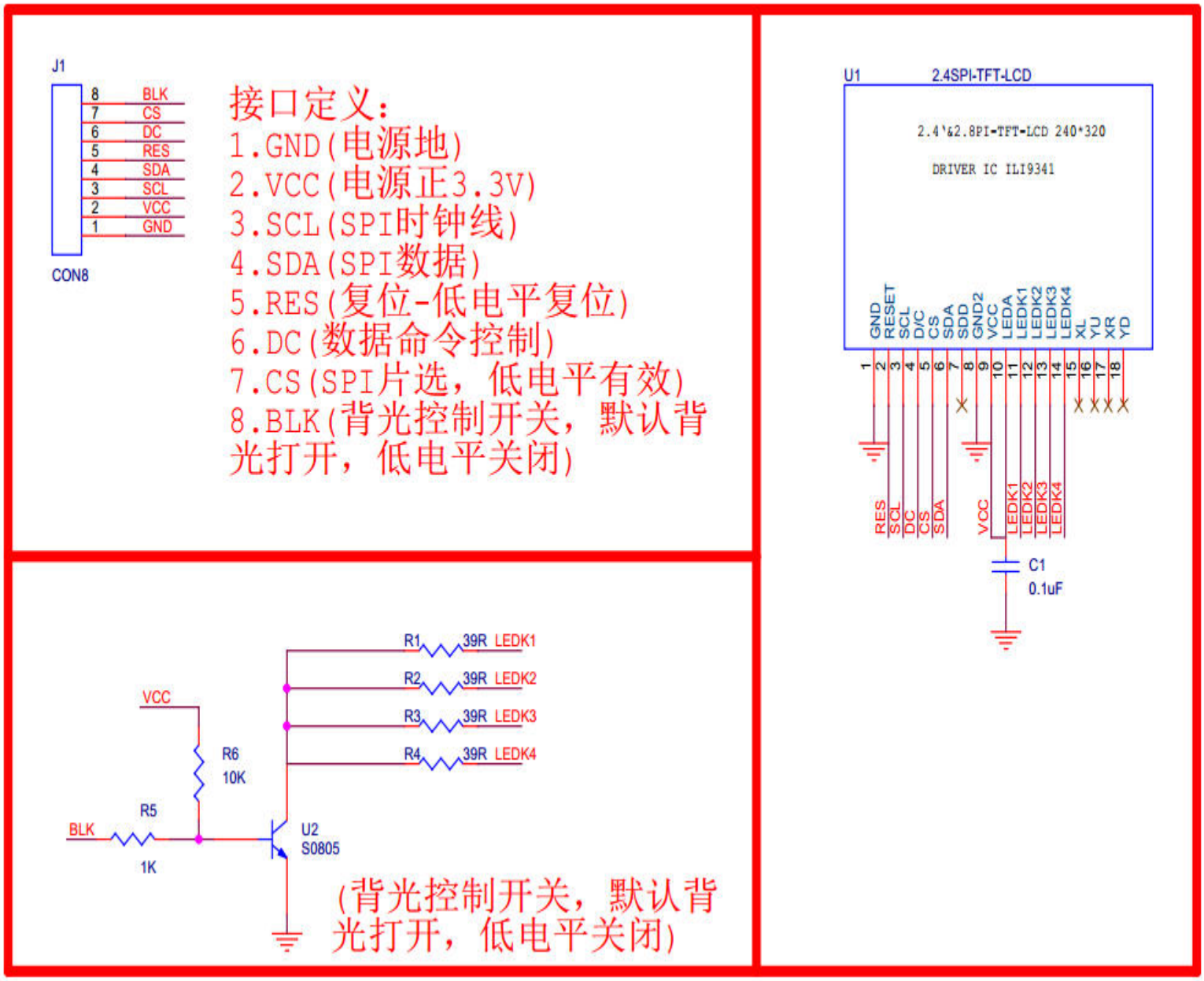
※NOTE:$P_{LCD=VDD*(I_{LED}+I_{LCD})}$

## 6. Module Function Description 显示屏脚位定义

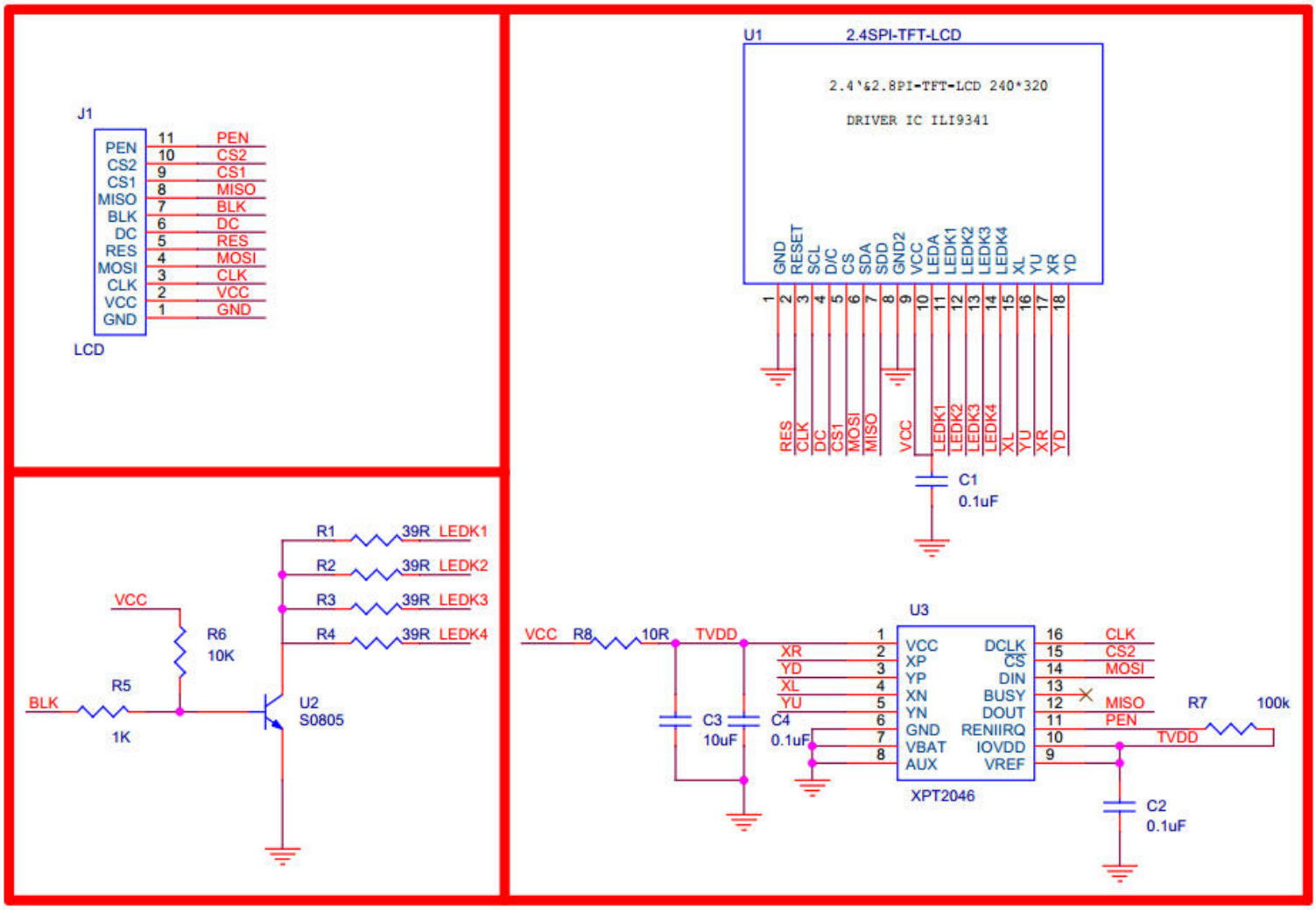
| PIN No.<br>引脚序号 | Symbol<br>引脚名称 | **Description**<br>作用描述 | Notes<br>备注 |
|---|---|---|---|
| 1 | **GND** | Ground<br>（接地脚） | - |
| 2 | **RESET** | -This signal will reset the device and it must be applied to properly initialize the chip.<br>-Signal is active low.<br>（显示屏复位脚，低电平有效） | - |
| 3 | **SCL** | -This pin is used to be serial interface clock.<br>（4 线-SPI 串口时钟） | - |
| 4 | **D/C** | - Display data/command selection pin in 4-line serial interface.<br>（4 线-SPI 数据/指令选择选择脚） | - |
| 5 | **CSX** | -Chip selection pin<br>Low enable.<br>High disable.<br>（显示屏驱动芯片选脚，低电平使能） | - |
| 6 | **SDA** | SPI interface input pin.<br>-The data is latched on the rising edge of the SCL signal.<br>-If not used, please fix this pin at VDDI or DGND level.<br>（4 线-SPI 数据输入，不用时接 VDDI 或 GND） | - |
| 7 | **SDO** | -SPI interface output pin.<br>-The data is output on the falling edge of the SCL signal.<br>-If not used, let this pin open.<br>（4 线-SPI 数据输出,不用时悬空） | - |
| 8 | **GND** | Ground<br>（接地脚） | - |
| 9 | **VDD** | Power Supply for Analog, Digital System and Booster Circuit.<br>（显示屏主电源供电脚 2.8-3.3V） | - |
| 10 | **LEDA** | Anode of Backlight (2.9V-3.3V Typical:3.1V)<br>（背光正极供电脚,电压范围:2.9-3.3V,典型值:3.1V） | - |
| 11 | **LEDK1** | Cathode of Backlight<br>（背光负极供电脚） | - |

| | | | |
|---|---|---|---|
| 12 | **LEDK2** | Cathode of Backlight<br>（背光负极供电脚） | - |
| 13 | **LEDK3** | Cathode of Backlight<br>（背光负极供电脚） | - |
| 14 | **LEDK4** | Cathode of Backlight<br>（背光负极供电脚） | - |
| 15 | **XL(X-)** | Touch panel Logical foot<br>(四线电阻触摸屏逻辑脚) | - |
| 16 | **YU(Y-)** | Touch panel Logical foot<br>(四线电阻触摸屏逻辑脚) | - |
| 17 | **XR(X+)** | Touch panel Logical foot<br>(四线电阻触摸屏逻辑脚) | - |
| 18 | **YD(Y+)** | Touch panel Logical foot<br>(四线电阻触摸屏逻辑脚) | - |

附图 6-1：显示屏 ZJY240L-C18N **4线-SPI 串口不带触摸参考应用电路**



**附图 6-2：触摸屏参考应用电路**



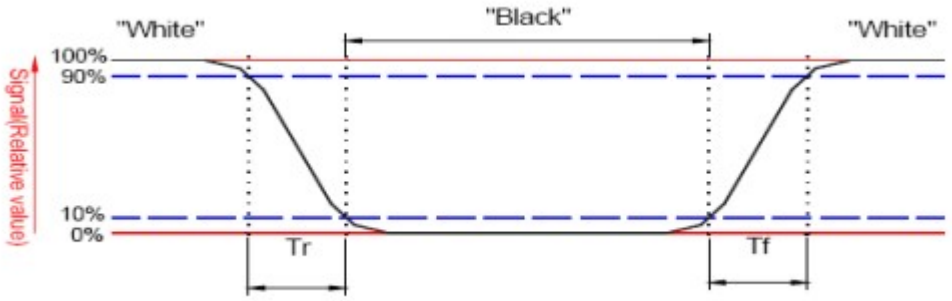

**※NOTE:**

1.若为不带触摸版本，参考附图 6-1 连接电路，把显示屏的 XL、YU、XR、YD 四个触摸脚悬空即可。

2.若为带触摸版本，参考附图 6-2 触摸应用连接电路。

## 7.Response time&Contrast ratio 响应时间与对比度

| Item<br>项目 | Symbol<br>符号 | Condition<br>条件 | Remark | | | Unit<br>单位 |
|---|---|---|---|---|---|---|
| | | | Min.<br>最小值 | Typ.<br>典型值 | Max.<br>最大值 | |
| Response time<br>响应时间 | Tr+Tf | θ =0° | - | 25 | 40 | ms |
| Contrast ratio<br>对比度 | CR | θ =0° | 350 | 500 | - | - |



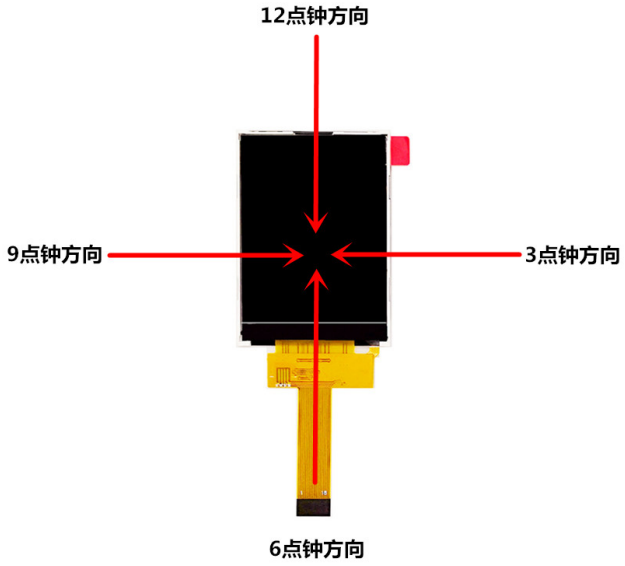

响应时间图示

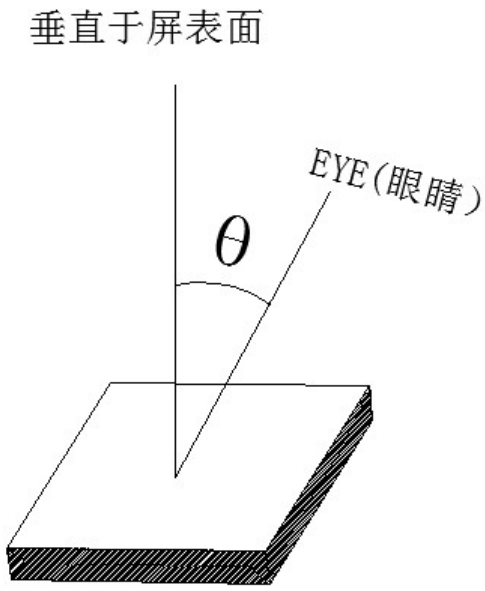
$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "white" state}}{\text{Brightness on the "black" state}}$$

对比度计算公式

## 8.Viewing Angle 视角宽度

| Item 项目 | Symbol 符号 | Condition 条件 | Remark | | | Unit 单位 |
|---|---|---|---|---|---|---|
| | | | Min. 最小值 | Typ. 典型值 | Max. 最大值 | |
| Viewing angle 视角宽度 | Top 12 点钟方向 | CR≥10 对比度大于等于 10 | 40 | 50 | - | Deg. 度 |
| | Bottom 6 点方向 | CR≥10 对比度大于等于 10 | 55 | 65 | - | |
| | Left 9 点钟方向 | CR≥10 对比度大于等于 10 | 55 | 65 | - | |
| | Right 3 点钟方向 | CR≥10 对比度大于等于 10 | 55 | 65 | - | |



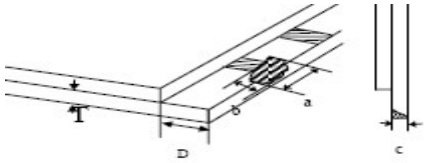

**NOTE:3 点，6 点，9 点，12 点方向视角的大小指的是垂直于屏表面的线眼睛视线之间的夹角（θ ）。**

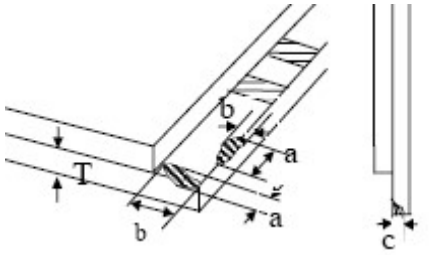
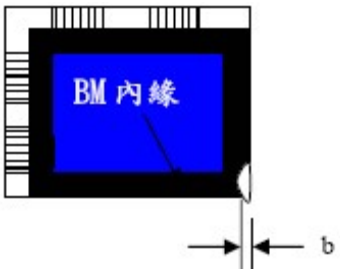
## 9. Reliability Trial 可靠性实验

| NO.<br>序号 | ITEM<br>实验项目 | CONDITION<br>实验环境 | CRITERION<br>实验规范 |
|---|---|---|---|
| 1 | High Temperature Non-Operating Test<br>高温存储实验 | 80℃*120Hrs | No Defect Of Operational Function In Room Temperature Are Allowable<br>室温运行功能无缺陷 |
| 2 | Low Temperature Non-Operating Test<br>低温存储实验 | -30℃*120Hrs | |
| 3 | High Temperature/Humidity Non Operating Test<br>高温高湿实验 | 60℃*90%RH*120Hrs | |
| 4 | High Temperature Operating Test<br>高温工作实验 | 70℃*72Hrs | |
| 5 | Low Temperature Operating Test<br>低温工作实验 | -20℃*72Hrs | |
| 6 | Thermal Shock Test<br>热冲实验 | -20 ℃ (30Min) ν 70 ℃ (30Min) *10CYCLES | |

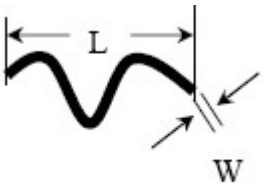
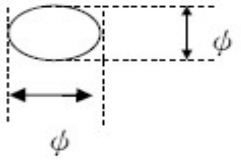
## 10.Inspection standards 检验标准

### 10.1Glass defect

| NO | Defect item | Criteria | Remark |
|---|---|---|---|
| 1 | Dimension Unconformity<br>(Major defect) | By Engineering Drawing | |
| 2 | Cracks<br>(Major defect) | 1. Linear cracks panel<br>【Reject】<br>2. Nonlinear crack contrast by limited sample |  |
| 3 | Glass extrude the conductive area<br>(minor defect) | a: disregards and no influence assemblage.<br>1) b≤1/3Pin width(non bonding area)<br>【Accept】<br>2)bonding area≤0.5mm<br>【Accept】 | A: Length, b: Width |
| 4 | Pin-side ,conductive area damaged<br>(minor defect) | (a c: disregards)<br>b≤1/3of effective length for bonding electrode<br>【Accept】 | a: length, b: Width, c: Thickness<br>  |
| 5 | Pin-side,non-conductive area damaged | 1)Damage area don't touch the ITO (Inclueling contraposition mark, | a: Length, b: Width c: Thickness |

| | | | |
|---|---|---|---|
| | (minor defect) | except scribing mark)<br>【Accept】<br>2)C<T b≦BM1/3of width<br>【Accept】<br>3)c=T<br>b not touch the seal glue<br>【Accept】<br>4)a disregards |  |
| 6 | Non-pin-side damage<br>(minor defect) | c<T<br>1)b exceeds 1/3Bm<br>【Reject】<br>c=T<br>b not touch the seal glue<br>【Reject】 | c: Thickness b: width of<br>  <br>damage |

## 10.2LCD appearance defect(View area)

| NO | Defect item | Criteria | | Remark |
|---|---|---|---|---|
| 1 | Fiber、glass cratch、polarizer scratch/folded (minor defect) | Specification | Allowable | note1:L: Length, W: Width<br>note2: disregard if out of AA<br>  |
| | | W≦0.03mm | disregard | |
| | | 0.03mm<W≦0.05mm; L≦3.0mm | 2 | |
| | | 0.05mm<W≦0.1mm; L≦3.0mm | 1 | |
| | | W>0.1mm;L>3.0mm | 0 | |
| 2 | Polarizer bubble、concave and convex (minor defect) | ϕ≦0.2mm | disregard | note1: ϕ=(L+W)/2, L:Length, W :Width<br>note2:disregard if out of AA |
| | | 0.2mm<ϕ≦0.3mm | 2 | |
| | | 0.3mm<ϕ≦0.5mm | 1 | |
| | | 0.5mm<ϕ | 0 | |
| 3 | Black dots、dirty dots、impurities、eye winker (minor defect) | ϕ≦0.15mm | disregard | note2:disregard if out of AA<br>  |
| | | 0.15mm<ϕ≦0.25mm | 2 | |
| | | 0.25mm<ϕ≦0.3mm | 1 | |
| | | 0.3mm<ϕ | 0 | |
| 4 | Polarizer prick (minor defect) | ϕ≦0.1mm | disregard | note1: ϕ=(L+W)/2, L=Length, W=Width<br>note2:the distance between two dots>5mm |
| | | 0.1mm<ϕ≦0.25mm | 3 | |
| | | ϕ>0.25mm | 0 | |

# 11.Package Method 包装方法

显示屏出货包装示意图：