

# INDUSTRIAL STRENGTH... Start Your Application From YOURITECH

Integration support

Obsolescence Management

PCAP

Embedded Systems

Human Machine Interface

Touch Solutions

Software

Quality Management

Open Frame Monitors

LCD Controller

Research & Development

Firmware

EMC tests

on-site service

Optical Bonding

In-house Manufacturing

Cover glass

System solutions

OEM Solutions

Custom Display

Production Custom designs Installation

Mechanical design



## 规格书

### Product Specification

|                                  |                                                              |
|----------------------------------|--------------------------------------------------------------|
| 客户名称<br>Customer                 |                                                              |
| 客户项目号<br>Part NO                 |                                                              |
| 产品型号<br>Part NO                  | ET022AM01-HT                                                 |
| 产品内容<br>Product type             | Mode:<br>AMOLED<br>LCD Module: 2.16"480RGB*480Dot QSPI /MIPI |
| 客户确认签章<br>Signature by Customer: |                                                              |

| PREPARED BY | CHECKED BY | APPROVED BY |
|-------------|------------|-------------|
|             |            |             |
|             |            |             |



## Records of Revision 修改记录

[illegible]

## Table of Contents 目录

|      |                                                               |    |
|------|---------------------------------------------------------------|----|
| 1    | General Description 规格简介                                      | 4  |
| 2    | Module Parameter 模组参数                                         | 4  |
| 3    | Mechanical Drawings 结构图                                       | 5  |
| 4    | Module Interface 模组接口定义                                       | 6  |
| 5    | Application Circuit 应用电路                                      | 6  |
| 6    | Absolute Maximum Ratings 绝对最大额定值                              | 7  |
| 7    | Electrical Specification 电性规格                                 | 7  |
| 8    | Initialization Code 初始化代码                                     | 8  |
| 9    | Optical Specifications 光学规格                                   | 7  |
| 9.1  | Optical Specifications 光学规格                                   |    |
| 9.2  | The power on/off sequence is illustrated below 电源启动/关闭顺序      | 9  |
| 9.3  | Definition of Contrast Ratio 对比度的定义                           | 9  |
| 9.4  | Definition of Viewing Angles 视角的定义                            | 9  |
| 9.5  | Definition of Color Appearance 色域的定义                          | 9  |
| 9.6  | Definition of Surface Luminance, Uniformity and Transmittance | 10 |
|      | 表面亮度、均匀性和透光率的定义                                               | 10 |
| 10   | Quality Assurance 质量标准                                        | 14 |
| 10.1 | Purpose 目的                                                    | 10 |
| 10.2 | Agreement Items 协议项目                                          | 10 |
| 10.3 | Standard of the Product Visual Inspection 产品外观检验标准            | 10 |
| 10.4 | Inspection Specification 检验标准                                 | 11 |
| 10.5 | Classification of Defects 缺陷的分类                               | 15 |
| 10.6 | Identification/marketing criteria 识别/评分标准                     | 15 |
| 11   | Reliability Specification 可靠性规范                               |    |
| 1512 | Precautions and Warranty 注意事项和保证                              | 16 |
| 12.1 | Safety 安全                                                     | 16 |
| 12.2 | Handling 处理                                                   | 16 |
| 12.3 | Operation 操作                                                  | 16 |
| 12.4 | Static Electricity 静电                                         | 17 |
| 12.5 | Limited Warranty 有限质量保证                                       | 17 |
| 13   | Prior Consult Matter 免责声明                                     | 17 |





## 1 General Description 规格简介

2.16 inch 480x480 is a color active matrix AMOLED module

This module has a 2.16 inch diagonally measured active area with 480x480 resolutions (480 horizontal by 480 vertical pixel arrays). Each pixel is divided into RED,

GREEN, BLUE dots and this module can display 16.7M colors.

2.16 英寸 480x480 是一个彩色有源矩阵 AMOLED 模块。该模块有一个 2.16 英寸的对角线测量的活动区域，分辨率为 480x480（480 水平和 480 垂直像素数组）。每个像素被分为红色、绿色、蓝点，该模块可以显示 16.7M 的颜色。

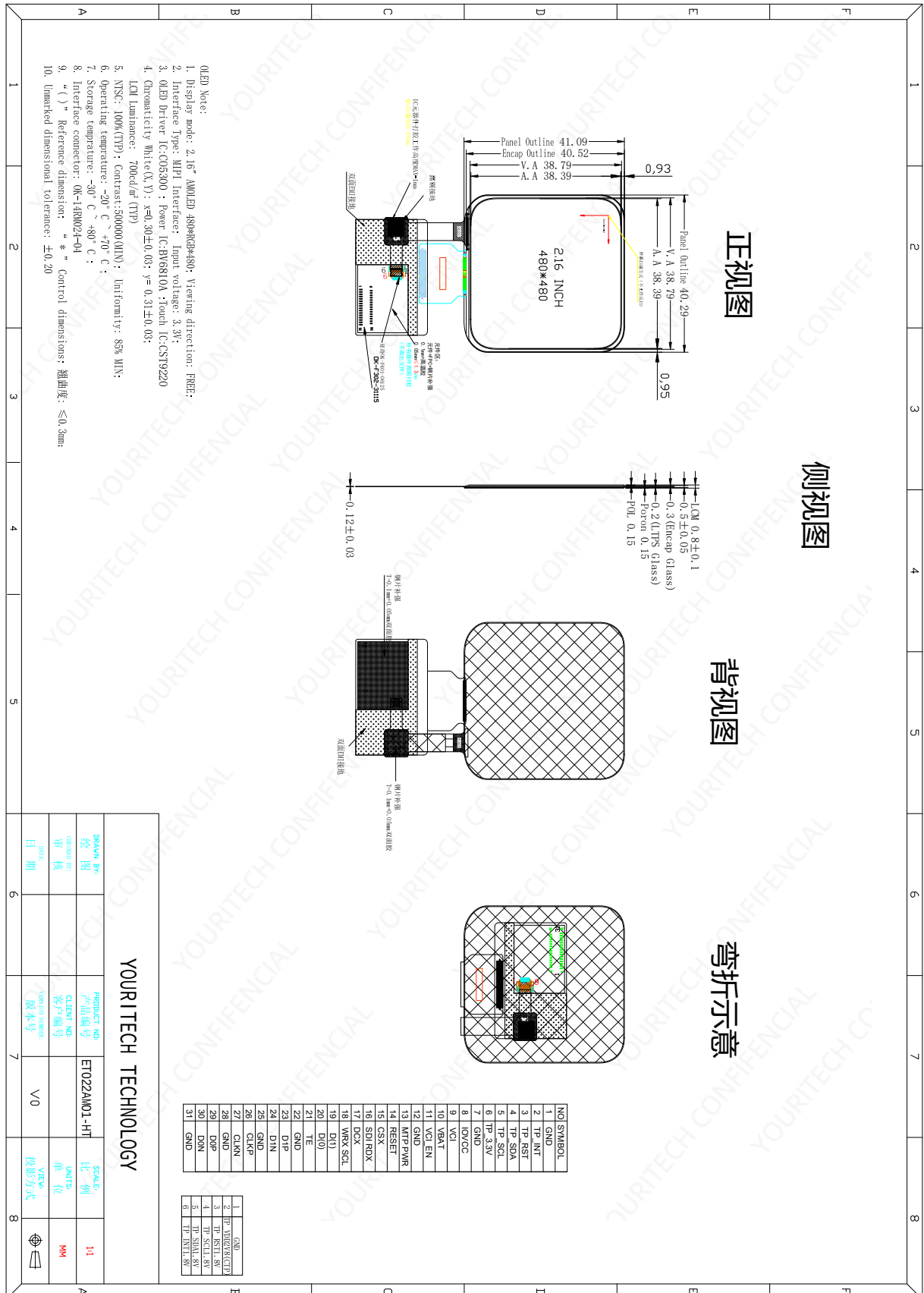
## 2 Module Parameter 模组参数

| Features                          | Details                   | Unit              |
|-----------------------------------|---------------------------|-------------------|
| Display Size(Diagonal) 显示尺寸(对角线)  | 2.16                      | inch              |
| 显示屏类型                             | LTPS-AMOLED               | -                 |
| Display Mode 显示模式                 | Transmissive OLED         | -                 |
| Resolution 分辨率                    | 480RGB x 480              | -                 |
| Active Area 显示区                   | 38.39(H) ×38.39(V)        | mm                |
| Module Outline 模组外形               | 40.29(H) ×41.09(V)×0.8(T) | mm                |
| Display Colors 显示颜色               | 16.7M                     | -                 |
| Interface 接口                      | QSPI/MIPI                 | -                 |
| Driver IC 驱动 IC                   | CO5300                    | -                 |
| TP Viewing Area TP 视窗             | /                         | mm                |
| TP Outline(assembly) TP 外形        | /                         | mm                |
| TP IC                             | CST9220                   |                   |
| Luminance on surface 亮度           | 600                       | cd/m <sup>2</sup> |
| View Direction 视角方向               | All                       | Best image        |
| Contrast ratio 对比度                | 50000:1                   |                   |
| Color gamut 色域                    | 108%                      |                   |
| PPI 图像点密集度                        | 314                       | -                 |
| Window effect 视窗效果                | 无一体黑                      | -                 |
| Cover plate surface effect 盖板表面效果 | 无 AF/AG                   | -                 |
| Operating Temperature 工作温度        | -20~70                    | °C                |
| Storage Temperature 储存温度          | -30~80                    | °C                |
| Weight 重量                         | TBD                       | g                 |

Note 1: Excluding hooks, posts , FPC/FPC tail etc.

## 3 Mechanical Drawings 结构





## 4 Module Interface 模组接口定义

| NO | SYMBOL  | FUNCTION                                                                                                          |
|----|---------|-------------------------------------------------------------------------------------------------------------------|
| 1  | GND     | Power Ground                                                                                                      |
| 2  | TP_INT  | Touch panel interrupt output                                                                                      |
| 3  | TP_RST  | Touch panel reset                                                                                                 |
| 4  | TP_SDA  | Touch panel I2C data                                                                                              |
| 5  | TP_SCL  | Touch panel I2C clock                                                                                             |
| 6  | TP 3.3  | Touch panel Power output                                                                                          |
| 7  | GND     | Power Ground                                                                                                      |
| 8  | IOVCC   | Power Supply for logic, VDDIO=1.8V~3.3V.                                                                          |
| 9  | VCI     | Power supply to DCDC power for DDIC use                                                                           |
| 10 | VBAT    | Power Input for SIBO VBAT=3.7~4.5V                                                                                |
| 11 | VCI_EN  | Power supply to DCDC power for DDIC use                                                                           |
| 12 | GND     | Power Ground                                                                                                      |
| 13 | MTP PWR | MTP programming power supply pin. (8V typical)<br>- Must be left open or connected to VSSD in normal condition.   |
| 14 | RESET   | - This signal will reset the device and must be applied to properly initialize the chip.<br>Signal is active low. |
| 15 | CSX     | chip select                                                                                                       |
| 16 | SDI RDX | serial data input 0 / serial data output                                                                          |
| 17 | DCX     | serial data input 1                                                                                               |
| 18 | WRX SCL | - SCL: A synchronous clock signal in SPI I/F.<br>- If not used, please connect to VSSI                            |
| 19 | D(1)    | serial data input 3                                                                                               |
| 20 | D(0)    | serial data input 2                                                                                               |
| 21 | TE      | Tearing effect output pin to synchronize MCU to frame writing, activated by S/W command                           |
| 22 | GND     | Power Ground                                                                                                      |
| 23 | D1P     | MIPI-DSI Data differential signal input pins.                                                                     |
| 24 | D1N     | MIPI-DSI Data differential signal input pins.                                                                     |
| 25 | GND     | Power Ground                                                                                                      |
| 26 | CLKP    | CLKP                                                                                                              |
| 27 | CLKN    | CLKN                                                                                                              |
| 28 | GND     | Power Ground                                                                                                      |
| 29 | D0P     | MIPI-DSI Data differential signal input pins.                                                                     |
| 30 | D0N     | MIPI-DSI Data differential signal input pins.                                                                     |
| 31 | GND     | Power Ground                                                                                                      |



## 6 Absolute Maximum Ratings 绝对最大额定值

| Item 项目                    |                   | Symbol    | Min.最小 | Max.最大    | Unit 单位 |
|----------------------------|-------------------|-----------|--------|-----------|---------|
| Supply Voltage 电源电压        | Power supply 电力供应 | VBAT      | 3.7    | 4.5       | V       |
|                            | Analog 模拟         | VCI       | 2.7    | 4.6       | V       |
|                            | IO                | IOVDD     | -0.3   | +4.6      | V       |
| Input Voltage 输入电压         |                   | $V_i$     | -0.3   | IOVDD+0.3 | V       |
| Storage temperature 储存温度   |                   | $T_{stg}$ | -30    | +70       | °C      |
| Operating temperature 工作温度 |                   | $T_{op}$  | -20    | +60       | °C      |
| Storage humidity 存储湿度      |                   | $H_{stg}$ | 10     | Note 1    | %RH     |
| Operating humidity 操作湿度    |                   | $H_{op}$  | 10     | Note 1    | %RH     |

VSS=0V, Ta=25°C

Note 1: 90%RH max, If Ta is below 50°C; 60%RH max, If Ta is over 60°C.

## 7 Electrical Specification 电性规格

DC Characteristics 直流特性

| Item 项目                         |                      | Symbol   | Min.最小    | Typ.中间  | Max.最大   | Unit 单位 |
|---------------------------------|----------------------|----------|-----------|---------|----------|---------|
| Supply Voltage 电源电压             | Powersupply 电力供应     | VBAT     | 3.7       | -       | 4.5      | V       |
|                                 | Analog               | VCI      | 2.7       | -       | 3.6      | V       |
|                                 | IO                   | IOVDD    | 1.65      | 1.8/2.8 | 3.3      | V       |
| Logic Low input voltage 输入电压低   |                      | $V_{IL}$ | -0.3IOVDD | -       | 0.3IOVDD | V       |
| Logic High input voltage 输入电压高  |                      | $V_{IH}$ | 0.7IOVDD  | -       | IOVDD    | V       |
| Logic Low output voltage 输出电压低  |                      | $V_{OL}$ | -         | -       | 0.2IOVDD | V       |
| Logic High output voltage 输出电压高 |                      | $V_{OH}$ | 0.8IOVDD  | -       | -        | V       |
| Current Consumption 电流消耗        | Normal display 正常的显示 | Ivdd     | -         | -       | -        | mA      |
|                                 | Standby mode 待机模式    | Ivdd     | -         | -       | -        | uA      |
| Frame Frequency 帧频              |                      | $f_{FR}$ | -         | 60      | -        | Hz      |

## 8 Initialization Code 初始化代码





## 9 Optical Specifications 光学规格

### 9.1 Optical Specifications 光学规格

Ta=25°C, VDD=2.8V, TN LC+ Polarizer

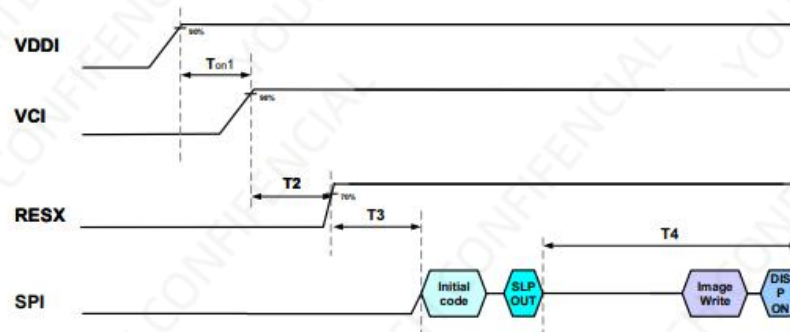
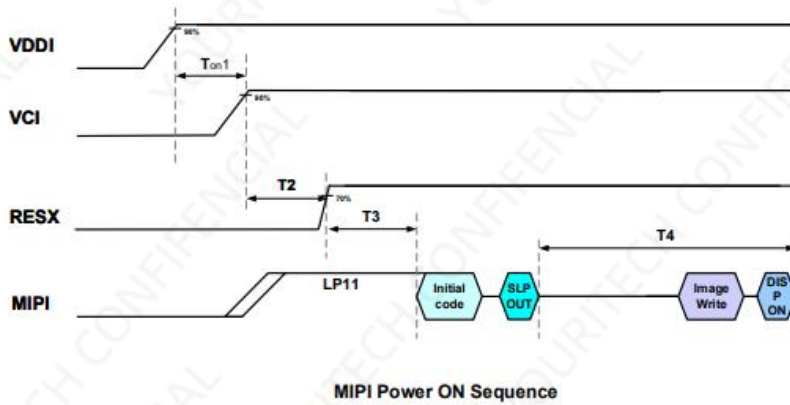
| Backlight On (Transmissive Mode) | Item<br>项目                                 |  | Symbol<br>标志   | Condition<br>条件                                             | Specification 规范      |            |            | Unit<br>单位        |      |
|----------------------------------|--------------------------------------------|--|----------------|-------------------------------------------------------------|-----------------------|------------|------------|-------------------|------|
|                                  |                                            |  |                |                                                             | Min.<br>最小            | Typ.<br>中间 | Max.<br>最大 |                   |      |
|                                  | Luminance on<br>surface( $I_f$ =20mA) 表面亮度 |  | $L_v$          | Normally<br>viewing<br>angle<br>$\theta_x=\theta_y=0^\circ$ |                       | 600        | -          | cd/m <sup>2</sup> |      |
|                                  | Contrast ratio 对比度                         |  | $CR$           |                                                             | 50000                 | -          | -          | -                 |      |
|                                  | Response time 响应时间                         |  | $TR$           |                                                             | -                     | 2          | 4          | ms                |      |
|                                  |                                            |  | $TF$           | -                                                           | -                     | 2          | 4          |                   |      |
|                                  | Chromaticity<br>Transmissive 色度            |  | Red<br>红       | $XR$                                                        | -                     | 0.643      | 0.683      | 0.723             | -    |
|                                  |                                            |  |                | $YR$                                                        |                       | 0.274      | 0.314      | 0.353             | -    |
|                                  |                                            |  | Green<br>绿     | $XG$                                                        |                       | 0.19       | 0.24       | 0.29              | -    |
|                                  |                                            |  |                | $YG$                                                        |                       | 0.678      | 0.728      | 0.778             | -    |
|                                  |                                            |  | Blue<br>蓝      | $XB$                                                        |                       | 0.108      | 0.138      | 0.168             | -    |
|                                  |                                            |  |                | $YB$                                                        |                       | 0.009      | 0.046      | 0.079             | -    |
|                                  |                                            |  | White<br>白     | $XW$                                                        |                       | 0.280      | 0.300      | 0.320             | -    |
|                                  |                                            |  |                | $YW$                                                        |                       | 0.290      | 0.310      | 0.330             | -    |
|                                  | Viewing Angle 视角                           |  | Horizo<br>ntal | $\theta X+$                                                 | Center<br>$CR\geq 10$ | 80         | -          | -                 | Deg. |
|                                  |                                            |  |                | $\theta X-$                                                 |                       | 80         | -          | -                 |      |
|                                  |                                            |  | Vertical       | $\theta Y+$                                                 |                       | 80         | -          | -                 |      |
|                                  |                                            |  |                | $\theta Y-$                                                 |                       | 80         | -          | -                 |      |
|                                  | NTSC Ratio(Gamut)                          |  |                | -                                                           | -                     | 97         | 108        | -                 | %    |





## 9.2 The power on/off sequence is illustrated below 电源启动/关闭顺序

The Power on sequence is shown as below.



## 9.3 Definition of Contrast Ratio 对比度的定义

Contrast is measured perpendicular to display surface in reflective and transmissive mode. The measurement condition is:

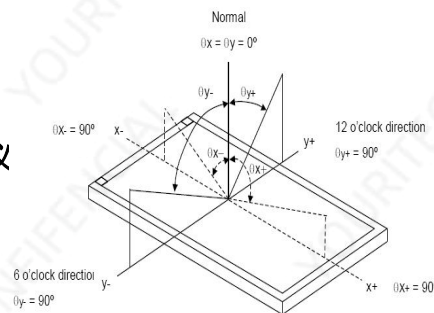
|                               |                                           |
|-------------------------------|-------------------------------------------|
| Measuring Equipment 测量设备      | BM-7 or EQUI                              |
| Measuring Point Diameter 测点直径 | 3mm//1mm                                  |
| Measuring Point Location 测点位置 | Active Area centre point                  |
| Test pattern 测试模式             | A: All Pixels white<br>B: All Pixel black |
| Contrast setting              | Maximum                                   |

Definitions: CR (Contrast) = Luminance of White Pixel / Luminance of Black Pixel

## 9.4 Definition of Viewing Angles 视角的定义

Measuring machine: LCD-5100 or EQUI

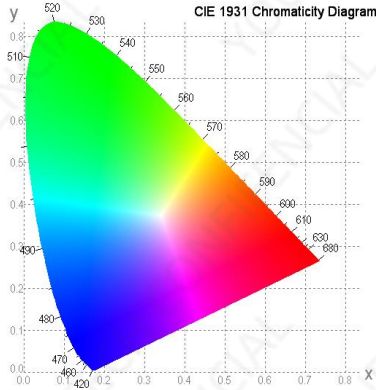
## 9.5 Definition of Color Appearance 色域的定义



R,G,B and W are defined by (x, y) on the IE chromaticity diagram

NTSC=area of RGB triangle/area of NTSC triangleX100%

Measuring picture: Red, Green, Blue and White (Measuring machine: BM-7)



## 9.6 Definition of Surface Luminance, Uniformity and Transmittance

表面亮度、均匀性和透光率的定义

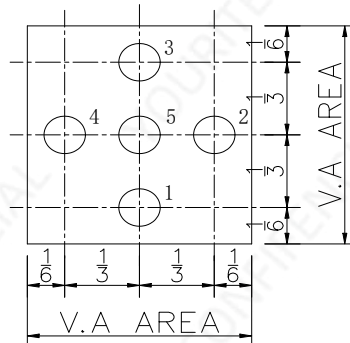
Using the transmissive mode measurement approach, measure the white screen luminance of the display panel and backlight.

9.6.1 Surface Luminance:  $LV = \text{average (LP1:LP5)}$

9.6.2 Uniformity =  $\text{Minimal (LP1:LP5)} / \text{Maximal (LP1:LP5)} * 100\%$

9.6.3 Transmittance =  $LV \text{ on LCD} / LV \text{ on Backlight} * 100\%$

Note :Measuring machine:BM-7



## 10 Quality Assurance 质量标准

### 10.1 Purpose 目的

This standard for Quality Assurance assures the quality of LCD module products supplied to customer by YOURITECH TECHNOLOGY.

### 10.2 Agreement Items 协议项目

YOURITECH TECHNOLOGY and customer shall negotiate if the following situation occurs:

10.2.1 Discrepancies between YOURITECH TECHNOLOGY's QA standards and customer's QA standards.

10.2.2 Additional requirement to be added in product specification.

10.2.3 Any other special problem.

### 10.3 Standard of the Product Visual Inspection 产品外观检验标准

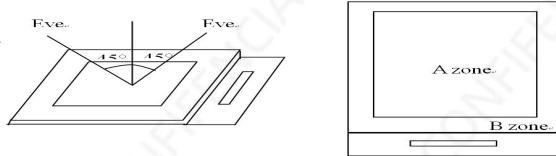


### 10.3.1 Appearance inspection:

10.3.1.1 The inspection must be under illumination about 1000 – 1500 lx, and the distance of view must be at 30cm ± 2cm.

10.3.1.2 The viewing angle should be 45° from the vertical line without reflection light or follows customer's viewing angle specifications.

10.3.1.3 Definition of area: A Zone: Active Area, B Zone: Viewing Area.



10.3.2 Basic principle: A set of sample to indicate the limit of acceptable quality level must be discussed by both YOURITECH TECHNOLOGY and customer when there is any dispute happened.

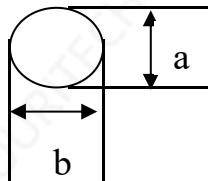
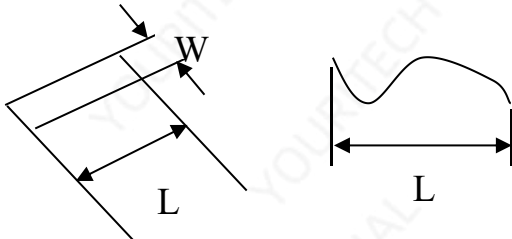
## 10.4 Inspection Specification 检验标准

Sampling plan according to GB/T2828.1-2012/ISO 2859-1: 1999 and ANSI/ASQC

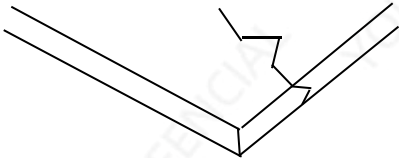
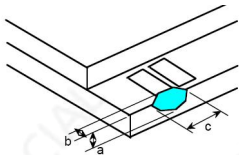
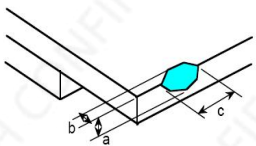
Z1.4-1993, normal level 2 and based on:

Major defect: AQL 0.4

Minor defect: AQL 1.0

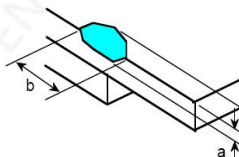
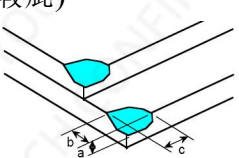
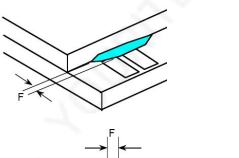
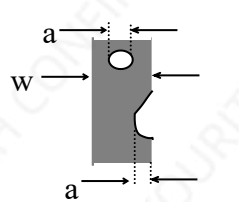
| No.                    | Item 项目                                                                                                                                               | Criteria (Unit: mm) 标准                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                       |              |          |                  |        |                        |        |              |                      |       |                                              |            |   |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------|------------------|--------|------------------------|--------|--------------|----------------------|-------|----------------------------------------------|------------|---|
| 01                     | Black / White spot<br>Foreign material<br>(Round type)<br>Pinholes Stain<br>Particles inside cell.<br>(Minor defect) 黑/白斑/异物<br>(圆类型)细胞内的针孔染色颗粒。(小瑕疵) | <br>$\phi = (a + b) / 2$<br>Distance between 2 defects should more than 10mm apart. | <table><tr><th>Area<br/>Size</th><th>Acc. Qty</th></tr><tr><td><math>\phi \leq 0.10</math></td><td>Ignore</td></tr><tr><td><math>0.10 &lt; \phi \leq 0.2</math></td><td>2</td></tr><tr><td><math>0.2 &lt; \phi</math></td><td>0</td></tr><tr><td>Total</td><td><math>N \leq 3</math><br/>NO include<br/><math>\phi \leq 0.10</math></td></tr></table> | Area<br>Size | Acc. Qty | $\phi \leq 0.10$ | Ignore | $0.10 < \phi \leq 0.2$ | 2      | $0.2 < \phi$ | 0                    | Total | $N \leq 3$<br>NO include<br>$\phi \leq 0.10$ |            |   |
|                        | Area<br>Size                                                                                                                                          | Acc. Qty                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                       |              |          |                  |        |                        |        |              |                      |       |                                              |            |   |
| $\phi \leq 0.10$       | Ignore                                                                                                                                                |                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                       |              |          |                  |        |                        |        |              |                      |       |                                              |            |   |
| $0.10 < \phi \leq 0.2$ | 2                                                                                                                                                     |                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                       |              |          |                  |        |                        |        |              |                      |       |                                              |            |   |
| $0.2 < \phi$           | 0                                                                                                                                                     |                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                       |              |          |                  |        |                        |        |              |                      |       |                                              |            |   |
| Total                  | $N \leq 3$<br>NO include<br>$\phi \leq 0.10$                                                                                                          |                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                       |              |          |                  |        |                        |        |              |                      |       |                                              |            |   |
| 02                     | Black and White line<br>Scratch<br>Foreign material<br>(Line type)<br>(Minor defect) 黑白线刮伤异物(类型)行<br>(小瑕疵)                                            |                                                                                    | <table><tr><th>Length</th><th>Width</th><th>Acc. Qty</th></tr><tr><td>/</td><td><math>W \leq 0.03</math></td><td>Ignore</td></tr><tr><td><math>L \leq 3</math></td><td><math>0.05 &lt; W \leq 0.08</math></td><td>2</td></tr><tr><td>/</td><td><math>0.08 &lt; W</math></td><td>0</td></tr></table>                                                   | Length       | Width    | Acc. Qty         | /      | $W \leq 0.03$          | Ignore | $L \leq 3$   | $0.05 < W \leq 0.08$ | 2     | /                                            | $0.08 < W$ | 0 |
|                        | Length                                                                                                                                                | Width                                                                                                                                                                  | Acc. Qty                                                                                                                                                                                                                                                                                                                                              |              |          |                  |        |                        |        |              |                      |       |                                              |            |   |
| /                      | $W \leq 0.03$                                                                                                                                         | Ignore                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                       |              |          |                  |        |                        |        |              |                      |       |                                              |            |   |
| $L \leq 3$             | $0.05 < W \leq 0.08$                                                                                                                                  | 2                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                       |              |          |                  |        |                        |        |              |                      |       |                                              |            |   |
| /                      | $0.08 < W$                                                                                                                                            | 0                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                       |              |          |                  |        |                        |        |              |                      |       |                                              |            |   |



| No.               | Item 项目                                                                             | Criteria (Unit: mm) 标准                                                                                                                                                                                                                                                |  |                  |          |                 |        |                |   |                |   |                   |  |
|-------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------|----------|-----------------|--------|----------------|---|----------------|---|-------------------|--|
|                   |                                                                                     | <table><tr><td>Total</td><td>N ≤ 2</td></tr></table>                                                                                                                                                                                                                  |  | Total            | N ≤ 2    |                 |        |                |   |                |   |                   |  |
| Total             | N ≤ 2                                                                               |                                                                                                                                                                                                                                                                       |  |                  |          |                 |        |                |   |                |   |                   |  |
|                   |                                                                                     | Distance between 2 defects should more than 10mm apart.<br>Scratches not viewable through the back of the display are acceptable.                                                                                                                                     |  |                  |          |                 |        |                |   |                |   |                   |  |
| 03                | Glass Crack<br>(Minor defect) 玻璃裂纹(小瑕疵)                                             | <br>LCD with extensible crack line is unacceptable(When press the cracked LCD area, the line will expand, we define it is extensible crack line)                                    |  |                  |          |                 |        |                |   |                |   |                   |  |
| 04                | Glass Chipping Pad Area: (Minor defect)<br>玻璃碎片面积:(轻微缺陷)                            | <table><tr><td>Length and Width</td><td>Acc. Qty</td></tr><tr><td>c &lt; 5.0, b&lt; 0.4</td><td>Ignore</td></tr></table>                                                                                                                                              |  | Length and Width | Acc. Qty | c < 5.0, b< 0.4 | Ignore |                |   |                |   |                   |  |
| Length and Width  | Acc. Qty                                                                            |                                                                                                                                                                                                                                                                       |  |                  |          |                 |        |                |   |                |   |                   |  |
| c < 5.0, b< 0.4   | Ignore                                                                              |                                                                                                                                                                                                                                                                       |  |                  |          |                 |        |                |   |                |   |                   |  |
|                   |  |                                                                                                                                                                                                                                                                       |  |                  |          |                 |        |                |   |                |   |                   |  |
| 05                | Glass Chipping Rear of PadArea:(Minor defect)<br>) 玻璃切屑垫区后方:<br>(小瑕疵)               | <table><tr><td>Length and Width</td><td>Acc. Qty</td></tr><tr><td>c &gt; 3.0, b&lt; 1.0</td><td>1</td></tr><tr><td>c&lt; 3.0, b&lt; 1.0</td><td>2</td></tr><tr><td>c&lt; 3.0, b&lt; 0.5</td><td>4</td></tr><tr><td colspan="2">a&lt;Glass Thickness</td></tr></table> |  | Length and Width | Acc. Qty | c > 3.0, b< 1.0 | 1      | c< 3.0, b< 1.0 | 2 | c< 3.0, b< 0.5 | 4 | a<Glass Thickness |  |
| Length and Width  | Acc. Qty                                                                            |                                                                                                                                                                                                                                                                       |  |                  |          |                 |        |                |   |                |   |                   |  |
| c > 3.0, b< 1.0   | 1                                                                                   |                                                                                                                                                                                                                                                                       |  |                  |          |                 |        |                |   |                |   |                   |  |
| c< 3.0, b< 1.0    | 2                                                                                   |                                                                                                                                                                                                                                                                       |  |                  |          |                 |        |                |   |                |   |                   |  |
| c< 3.0, b< 0.5    | 4                                                                                   |                                                                                                                                                                                                                                                                       |  |                  |          |                 |        |                |   |                |   |                   |  |
| a<Glass Thickness |                                                                                     |                                                                                                                                                                                                                                                                       |  |                  |          |                 |        |                |   |                |   |                   |  |
|                   |  |                                                                                                                                                                                                                                                                       |  |                  |          |                 |        |                |   |                |   |                   |  |





| No.                   | Item 项目                                                                                                                                             | Criteria (Unit: mm) 标准                                                                                                                                                                                                                                     |                  |          |                       |        |                  |        |                   |  |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------|-----------------------|--------|------------------|--------|-------------------|--|
| 06                    | Glass Chipping Except Pad Area: (Minor defect) 除垫区外的玻璃切屑:(小瑕疵)<br> | <table><tr><th>Length and Width</th><th>Acc. Qty</th></tr><tr><td><math>c \leq 0.6, b &lt; 5.0</math></td><td>Ignore</td></tr><tr><td colspan="2">aGlass Thickness</td></tr></table>                                                                       | Length and Width | Acc. Qty | $c \leq 0.6, b < 5.0$ | Ignore | aGlass Thickness |        |                   |  |
| Length and Width      | Acc. Qty                                                                                                                                            |                                                                                                                                                                                                                                                            |                  |          |                       |        |                  |        |                   |  |
| $c \leq 0.6, b < 5.0$ | Ignore                                                                                                                                              |                                                                                                                                                                                                                                                            |                  |          |                       |        |                  |        |                   |  |
| aGlass Thickness      |                                                                                                                                                     |                                                                                                                                                                                                                                                            |                  |          |                       |        |                  |        |                   |  |
| 07                    | Glass Corner Chipping: (Minor defect) 玻璃切角:(小瑕疵)<br>              | <table><tr><th>Length and Width</th><th>Acc. Qty</th></tr><tr><td><math>c &lt; 2.0, b &lt; 1.5</math></td><td>Ignore</td></tr><tr><td><math>c &lt; 1.5, b &lt; 2</math></td><td>Ignore</td></tr><tr><td colspan="2">a&lt;Glass Thickness</td></tr></table> | Length and Width | Acc. Qty | $c < 2.0, b < 1.5$    | Ignore | $c < 1.5, b < 2$ | Ignore | a<Glass Thickness |  |
| Length and Width      | Acc. Qty                                                                                                                                            |                                                                                                                                                                                                                                                            |                  |          |                       |        |                  |        |                   |  |
| $c < 2.0, b < 1.5$    | Ignore                                                                                                                                              |                                                                                                                                                                                                                                                            |                  |          |                       |        |                  |        |                   |  |
| $c < 1.5, b < 2$      | Ignore                                                                                                                                              |                                                                                                                                                                                                                                                            |                  |          |                       |        |                  |        |                   |  |
| a<Glass Thickness     |                                                                                                                                                     |                                                                                                                                                                                                                                                            |                  |          |                       |        |                  |        |                   |  |
| 08                    | Glass Burr: (Minor defect) 玻璃磨:(小瑕疵)<br>                         | Glass burr don't affect assemble and module dimension.<br><table><tr><th>Length</th><th>Acc. Qty</th></tr><tr><td><math>F &lt; 0.5</math></td><td>Ignore</td></tr></table>                                                                                 | Length           | Acc. Qty | $F < 0.5$             | Ignore |                  |        |                   |  |
| Length                | Acc. Qty                                                                                                                                            |                                                                                                                                                                                                                                                            |                  |          |                       |        |                  |        |                   |  |
| $F < 0.5$             | Ignore                                                                                                                                              |                                                                                                                                                                                                                                                            |                  |          |                       |        |                  |        |                   |  |
| 09                    | FPC Defect: (Minor defect) FPC 缺陷:(小瑕疵)<br>                      | 9.1 Dent, pinhole width $a < w/3$ .<br>(w: circuitry width.)<br>9.2 Open circuit is unacceptable.<br>9.3 No oxidation, contamination and distortion.                                                                                                       |                  |          |                       |        |                  |        |                   |  |
| 10                    | Screen deformation 屏幕上的变形<br>                                    | Test for insertion of plug gauge at highest warping point:<br>(3.1-6.0inches)<br>$H \leq 0.3\text{MM}$<br>The client has special requirements,according to drawing                                                                                         |                  |          |                       |        |                  |        |                   |  |



| No. | Item 项目                                            | Criteria (Unit: mm) 标准                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |
|-----|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| 11  | Bubble on Polarizer<br>(Minor defect) 偏光片上的气泡(小瑕疵) | Diameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Acc. Qty |
|     |                                                    | $\varphi \leq 0.15$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Ignore   |
|     |                                                    | $0.15 < \varphi \leq 0.25$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2        |
|     |                                                    | $0.25 < \varphi \leq 0.3$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1        |
|     |                                                    | $0.3 < \varphi$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0        |
| 12  | Dent on Polarizer<br>(Minor defect) 偏光片上的凹痕(小瑕疵)   | Diameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Acc. Qty |
|     |                                                    | $\varphi \leq 0.15$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Ignore   |
|     |                                                    | $0.15 < \varphi \leq 0.25$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2        |
|     |                                                    | $0.25 < \varphi \leq 0.30$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1        |
|     |                                                    | $0.3 < \varphi$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0        |
| 13  | Bezel 边框                                           | 13.1 No rust, distortion on the Bezel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |          |
| 14  | Touch Panel 触控面板                                   | D: Diameter W: width L: length<br>14.1 Spot: $D \leq 0.20$ is acceptable<br>$0.20 < D \leq 0.3$ , acceptable QTY, 3<br>$D > 0.3$ is unacceptable<br>14.2 Dent (dot):<br>$D \leq 0.20$ is acceptable<br>$0.20 < D \leq 0.3$ , acceptable QTY, 3<br>$D > 0.30$ is unacceptable<br>2dots are acceptable and the distance between defects should more than 10 mm.<br>Dent (line) According to the limit sample<br>14.3 Scratch: $W \leq 0.03$ , $L \leq 10$ is acceptable,<br>$0.03 < W \leq 0.10$ , $L \leq 10$ , acceptable QTY, 3<br>$W > 0.10$ is unacceptable.<br>Distance between 2 defects should more than 10 mm. |          |
| 15  | PCB                                                | 15.1 No distortion or contamination on PCB terminals.<br>15.2 All components on PCB must same as documented on the BOM/component layout.<br>15.3 Follow IPC-A-600F.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |          |
| 16  | Soldering 焊接                                       | Follow IPC-A-610C standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |



| No. | Item 项目                                        | Criteria (Unit: mm) 标准                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17  | Electrical Defect<br>(Major defect) 电气缺陷(主要缺陷) | <p>The below defects must be rejected.</p> <p>17.1 Missing vertical / horizontal segment,</p> <p>17.2 Abnormal Display.</p> <p>17.3 No function or no display.</p> <p>17.4 Current exceeds product specifications.</p> <p>17.5 LCD viewing angle defect.</p> <p>17.6 No Backlight.</p> <p>17.7 Dark Backlight.</p> <p>17.8 Touch Panel no function.</p> <p>17.9 Dark Dot –one Allowed.</p> <p>17.10 Bright Dot – one Allowed.</p> <p>Remark:</p> <p>1. A pixel defect is acceptable if one color is none functional and causes a bright dot. The display may have one case where one color is out and cause a dark dot.</p> <p>2. Bright dot caused by scratch and foreign object accords to item1.</p> |
| 18  | Light leak 漏光                                  | Yellow light OK; White light,According to the limit sample                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Remark: Visual and cosmetic defects are rejectable only if these fall within the LCD viewing area.

### 10.5 Classification of Defects 缺陷的分类

Visual defects (Except no / wrong label) are treated as minor defect and electrical defect is major.

### 10.6 Identification/marketing criteria 识别/评分标准

Any unit with illegible / wrong /double or no marking/ label shall be rejected.

## 11 Reliability Specification 可靠性规范

| Item<br>项目                                                   | Condition<br>条件                                  | Cycle Time<br>周期时间 | Quantity<br>数量 | Remark<br>备注 |
|--------------------------------------------------------------|--------------------------------------------------|--------------------|----------------|--------------|
| Constant Temp. and Constant Humidity Operation Test 恒温恒湿运行试验 | $+40 \pm 3^{\circ}\text{C}, 90 \pm 3\%\text{RH}$ | 96hrs              | --             | *1           |
| High Temp. Operation Test 高温操作试验                             | $+70 \pm 3^{\circ}\text{C}$                      | 96hrs              | --             |              |
| Low Temp. Operation Test 低温操作试验                              | $-20 \pm 3^{\circ}\text{C}$                      | 96hrs              | --             |              |
| Thermal Shock Test 热冲击试验                                     | $-20 \pm 3^{\circ}\text{C} (30\text{min})$       | 10cycles           | --             |              |



|                                            |                                                                       |         |                     |        |
|--------------------------------------------|-----------------------------------------------------------------------|---------|---------------------|--------|
|                                            | +70 ± 3°C (30min)                                                     |         |                     |        |
| ESD Test(end product) ESD 测试<br>(最终产品)     | 150pF, 330Ω, ±2KV,Contact                                             | 10times | --                  | *2, *3 |
|                                            | 150pF, 330Ω, ±6KV, Air                                                |         |                     |        |
| Vibration Test(for packaging) 振动<br>测试(包装) | Frequency: 10Hz to 55Hz<br>to10Hz,Swing:1.5mm,time:<br>X,Y,Z each 2H. | 6hrs    | One inner<br>carton | *4     |

Note 1. For humidity test, DI water should be used.

Inspection Standard: Inspect after 1-2hrs storage at room temperature, the sample shall be free from the following defects:

- Air bubble in the LCD
- Seal Leakage
- Non-display
- Missing Segment
- Glass Crack
- IDD is greater than twice initial value.
- Others as per QA Inspection Criteria

Note 2. No defect is allowed after testing

The End Product ESD value is only indicative and depends on customer ESD protection design for the whole system.

Note 3. ESD should be applied to LCD glass panel, not other areas (such as on IC and so on)

IDD should be within twice initial value.

In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.

Note 4. Only upon request.

## 12 Precautions and Warranty 注意事项和保证

### 12.1 Safety 安全

12.1.1 The liquid crystal in the LCD is poisonous. Do not put it in your mouth. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water.

12.1.2 Since the liquid crystal cells are made of glass, do not apply strong impact on them. Handle with care.

### 12.2 Handling 处理

12.2.1 Reverse and use within ratings in order to keep performance and prevent damage.

12.2.2 Do not wipe the polarizer with dry cloth, as it might cause scratch. If the surface of the LCD needs to be cleaned, wipe it swiftly with cotton or other soft cloth soaked with petroleum IPA, do not use other chemicals.





### 12.3 Operation 操作

12.3.1 Do not drive LCD with DC voltage

12.3.2 Response time will increase below lower temperature

12.3.3 Display may change color with different temperature

12.3.4 Mechanical disturbance during operation, such as pressing on the display area, may cause the segments to appear “fractured”.

### 12.4 Static Electricity 静电

12.4.1 CMOS LSIs are equipped in this unit, so care must be taken to avoid the electro-static charge, by ground human body, etc.

12.4.2 The normal static prevention measures should be observed for work clothes and benches.

12.4.3 The module should be kept into anti-static bags or other containers resistant to static for storage.

### 12.5 Limited Warranty 有限质量保证

12.5.1 Unless otherwise agreed between YOURITECH TECHNOLOGY and customer, YOURITECH TECHNOLOGY will replace or repair any of its LCD and LCM which YOURITECH TECHNOLOGY found to be defective electrically and visually when inspected in accordance with YOURITECH TECHNOLOGY Quality Standards, for a period of one year from date of shipment.

12.5.2 The warranty liability of YOURITECH TECHNOLOGY is limited to repair and/or replacement .YOURITECH TECHNOLOGY will not be responsible for any consequential loss.

12.5.3 If possible, we suggest you use up all modules in six months. If the module storage time over twelve months, we suggest that recheck it before the module be used.

## 13 Prior Consult Matter 免责声明

1. For YOURITECH TECHNOLOGY standard products, we keep the right to change material, process for improving the product property without prior notice to our customer.

2. For OEM products, if any changes are needed which may affect the product property, we will consult with our customer in advance.

3. If you have special requirement about reliability condition, please let us know before you start the test on our samples.

### Reference 参考

| Item 项目              | Description 描述       | Revision 修订 |
|----------------------|----------------------|-------------|
| CO5300               | IC Data sheet        | V0          |
| Panel 2.16 寸 480X480 | LCM assembly drawing | V0          |

