深圳市勋瑞光电科技有限公司
Xunrui Shenzhen Optoelectronics Technology Co., Ltd.

# APPROVAL SHEET

## 承 认 书

版本：V1.0

| | |
|---|---|
| Customer<br>客户名称 | |
| Part NO.<br>产品型号 | H-280H24-007 |
| Product type<br>产品内容 | Mode: Transmissive type .Normally white.<br>TFT LCD Module<br>LCD Module: Graphic 240RGB*320 Dot-matrix |
| Remarks<br>备注栏 | □APPROVAL FOR SEPCIFICATIONS ONLY<br>■APPROVAL FOR SEPCIFICATIONS AND SAMPLE |

**工程确认**

| 核准 | 审核 | 定制 |
|---|---|---|
| | | |

**客户确认**

| 核准 | 审核 | 审核 |
|---|---|---|
| | | |

# CONTENTS



## GENERAL INFORMATION

| Item | Contents | Unit |
|---|---|---|
| Driver element | a-Si TFT active matrix | -- |
| Viewing direction | 12 O'CLOCK | O' Clock |
| TP V/A (W × H) | -- | mm |
| Active area (W×H) | 43.2 * 57.6 | mm |
| Number of Dots | 240(RGB)×320 | Pixel |
| Driver IC | ILI9341 | -- |
| Colors | 65K/262K | -- |
| Weight | TBD | g |
| Backlight Type | LED | -- |
| Interface Type | Parallel | -- |
| Input voltage | 2.8/3.3 | V |

## ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Supply voltage for logic | $V_{DD}$ | -0.3 | 3.3 | V |

| | | | | |
|---|---|---|---|---|
| Input voltage | VIN | -0.3 | VDD+0.3 | V |
| Operating temperature | TOP | -20 | 70 | ℃ |
| Storage temperature | TST | -30 | 80 | ℃ |
| Humidity | RH | | 90%(Max60℃) | RH |

## ELECTRICAL CHARACTERISTICS

DC CHARACTERISTICS

| Parameter | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Supply voltage for logic | VDD | 2.5 | - | 3.3 | V |
| Input Current | Idd | — | 2.08 | 3.26 | mA |
| Supply voltage for I/O circuit | IOVCC | 1.65 | - | 3.3 | V |
| Input voltage ' H' level | VIH | 0.7 IOVCC | — | — | V |
| Input voltage ' L' level | VIL | — | — | 0.3 IOVCC | V |
| Output voltage ' H' level | VOH | 0.8 IOVCC | — | — | V |
| Output voltage ' L' level | VOL | — | — | 0.2 IOVCC | V |

## TIMING OF POWER SUPPLY

PLEASE REFER TO THE DRIVER IC SPECIFICATION.

## BACKLIGHT CHARACTERISTICS

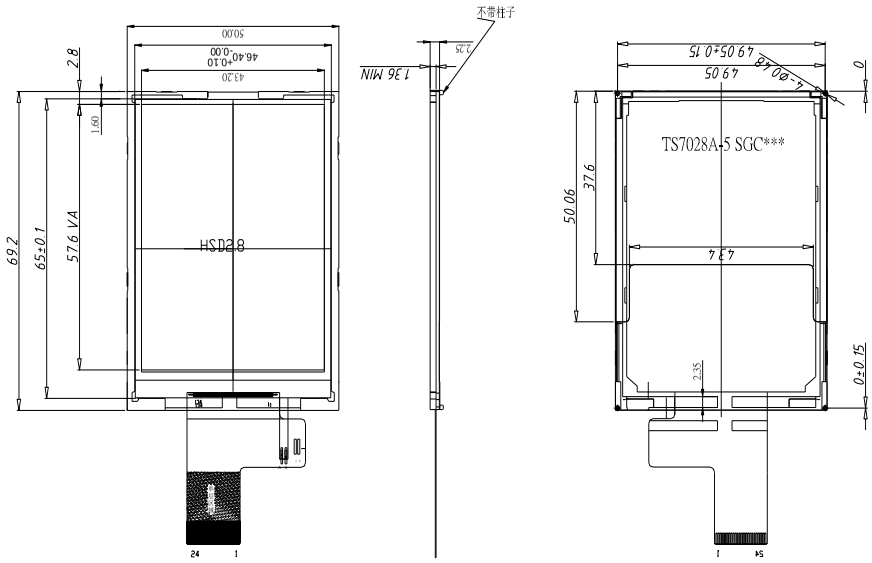
| Item | Symbol | Min | Typ | Max | Unit | Condition |
|---|---|---|---|---|---|---|
| Forward voltage | Vf | 2.9 | 3.2 | 3.4 | V | If=60 mA |
| Luminance | LV | 3600 | - | - | cd/㎡ | |
| Number of LED | - | 4 | | | Piece | - |
| Connection mode | p | Parallel | | | - | - |

## EXTERNAL DIMENSIONS

深圳市勋瑞光电科技有限公司

Xunrui Shenzhen Optoelectronics Technology Co., Ltd.

| VER. | DESCRIPTION | DATE |
|---|---|---|
| #0 | THE FIRST ISSUE | 2014.11.05 |




| No. | PIN NAME |
|---|---|
| 1 | VCC |
| 2 | GND |
| 3 | LEDA |
| 4 | RESET |
| 5 | CS |
| 6 | RS |
| 7 | WR |
| 8 | RD |
| 9 | DB0 |
| 10 | DB1 |
| 11 | DB2 |
| 12 | DB3 |
| 13 | DB4 |
| 14 | DB5 |
| 15 | DB6 |
| 16 | DB7 |
| 17 | DB8 |
| 18 | DB9 |
| 19 | DB10 |
| 20 | DB11 |
| 21 | DB12 |
| 22 | DB13 |
| 23 | DB14 |
| 24 | DB15 |

NOTES:

1.DISPLAY TYPE:
Main LCD:2.8"TFT, Transmissive

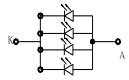
2. OPERATING TEMP: -20°C~70°C

3. STORAGE TEMP : -30°C~80°C

4. MAIN LCD DRIVER: ILI9341

5. BACKLIGHT: 4CHIP-WHITE LED

6.UNSPECIFIED TOLERANCES:±0.2MM



Backlight circuit
DC3.2V,15mA*4

深圳市勋瑞光电科技有限公司
Xunrui Shenzhen Optoelectronics Technology Co., Ltd.

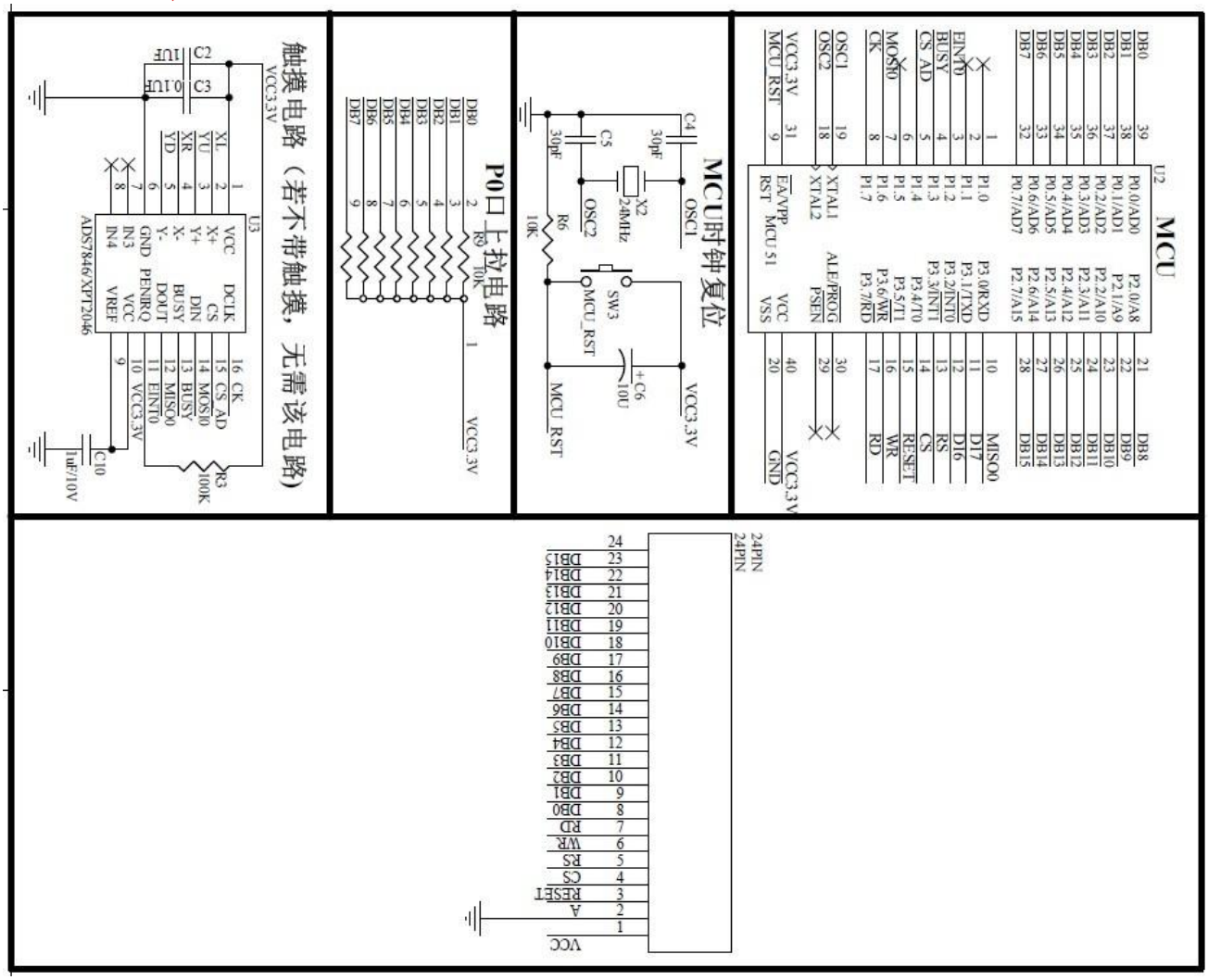
| | | | | |
|---|---|---|---|---|
| 成品型号 | | | | SCALE : FIT |
| 设计 | | 日期 | 2014.11.05 | UNIT : mm |
| 结构审核 | | 日期 | | PRO.(3): |
| 电子审核 | | 日期 | | SHEET : 1/5 |

Version :A

INTERFANCE SIGANL:

| PIN 脚 | 名称 | 描述 | 电路接法 |
|---|---|---|---|
| 1 | VCC | 电源接3.3V | 接3.3V电源 |
| 2 | GND | 电源负极 | 接电源负极 |
| 3 | LEDA | 背光正极，接3.1V-3.4V | 接3.1V-3.4V |
| 4 | RESET | LCD驱动芯片复位信号 低电平复位 | 接普通IO口或硬件复位电路 |
| 5 | CS | LCD驱动芯片片选信号，低电平有效 | 接普通IO口 |
| 6 | RS | 寄存器选择RS=1：写参数.数据.RS=0：写命令 | 接普通IO口 |
| 7 | WR | LCD驱动芯片写允许信号，低电平有效 | 接普通IO口 |
| 8 | RD | LCD驱动芯片读允许信号，低电平有效 | 接普通IO口 |
| 9 | DB0 | 数据线 使用8位接口时，悬空或接GND | 接普通 IO 口 |
| 10 | DB1 | 数据线 使用8位接口时，悬空或接GND | 接普通 IO 口 |
| 11 | DB2 | 数据线 使用8位接口时，悬空或接GND | 接普通 IO 口 |
| 12 | DB3 | 数据线 使用8位接口时，悬空或接GND | 接普通 IO 口 |
| 13 | DB4 | 数据线 使用8位接口时，悬空或接GND | 接普通 IO 口 |
| 14 | DB5 | 数据线 使用8位接口时，悬空或接GND | 接普通 IO 口 |
| 15 | DB6 | 数据线 使用8位接口时，悬空或接GND | 接普通 IO 口 |
| 16 | DB7 | 数据线 使用8位接口时，悬空或接GND | 接普通 IO 口 |
| 17 | DB8 | 数据线 | 接普通 IO 口 |
| 18 | DB9 | 数据线 | 接普通 IO 口 |
| 19 | DB10 | 数据线 | 接普通 IO 口 |
| 20 | DB11 | 数据线 | 接普通 IO 口 |
| 21 | DB12 | 数据线 | 接普通 IO 口 |
| 22 | DB13 | 数据线 | 接普通 IO 口 |
| 23 | DB14 | 数据线 | 接普通 IO 口 |
| 24 | DB15 | 数据线 | 接普通 IO 口 |
| | | **16位接口时，数据线DB15-DB0;**<br>**8位接口时，数据线DB15-DB8** | |

## APPLICATION CIRCUIT




## INITIAL CODE

Please consult our technical department for detail information.

## ELECTRO-OPTICAL CHARACTERISTICS

| Item | | Symbol | Condition | Min | Typ | Max | Unit | Remark | Note |
|---|---|---|---|---|---|---|---|---|---|
| Response time | | Tr+Tf | θ =0° ∅=0° Ta=25℃ | - | 30 | - | ms | FIG 1. | 4 |
| Contrast ratio | | Cr | | - | 300 | - | - | FIG 2. | 1 |
| Luminance uniformity | | δ WHITE | | 80 | - | - | % | FIG 2. | 3 |
| Surface Luminance | | Lv | | 180 | - | - | cd/㎡ | FIG 2. | 2 |
| Viewing angle range | | θ | ∅=90° | - | 30 | - | deg | FIG 3. | 6 |
| | | | ∅=270° | - | 30 | - | deg | FIG 3. | |
| | | | ∅=0° | - | 45 | - | deg | FIG 3. | |
| | | | ∅=180° | - | 45 | - | deg | FIG 3. | |
| CIE(x,y) chromaticity | Red | x | θ =0° ∅=0° Ta=25℃ | 0.633 | 0.653 | 0.673 | | FIG 2. | 5 |
| | | y | | 0.310 | 0.330 | 0.350 | | | |
| | Green | x | | 0.296 | 0.316 | 0.336 | | | |
| | | y | | 0.556 | 0.576 | 0.596 | | | |
| | Blue | x | | 0.118 | 0.138 | 0.158 | | | |

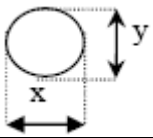
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | y | | 0.110 | 0.130 | 0.150 | | | |
| | White | x | | 0.288 | 0.308 | 0.328 | | | |
| | | y | | 0.317 | 0.337 | 0.357 | | | |

# 4.Standards of inspection items

## 4.1Major Defect

| Item No | Items to be inspected | Inspection Standard | Classification of defects |
|---|---|---|---|
| 4.1.1 | All functional defects | 1.No display<br>2.Display abnormally<br>3.Missing vertical, horizontal segment<br>4.Short circuit<br>5. Back-light no lighting, flickering and abnormal lighting. | Major |
| 4.1.2 | Missing | Missing component | |
| 4.1.3 | Outline dimension | Overall outline dimension beyond the drawing is not allowed. | |
| 4.1.4 | linearity | No more than 1.5% | |

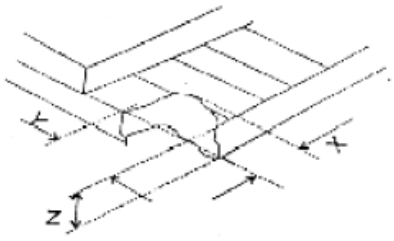
## 4.2 Cosmetic Defect

| Item No | Items to be inspected | Inspection Standard | | | | Classification of defects |
|---|---|---|---|---|---|---|
| 4.21 | **Clear Spots**<br>Black and white Spot defect Pinhole, Foreign Particle, polarizer Dirt | For dark/white spot, size Φ is defined as $\Phi=\frac{(x+y)}{2}$  | | | | Minor |
| | | 1 | | | | |
| | | Zone / Size(mm) | Acceptable Qty | | | |
| | | | A | B | C | |
| | | Φ≤0.15 | Ignore | | Ignore | |
| | | 0.15<Φ≤0.20 | 2 | | | |
| | | 0.20<Φ≤0.30 | 1 | | | |
| | | Φ>0.30 | 0 | | | |
| | **Clear Spots**<br>TP Dirt | 2 | | | | Minor |
| | | Zone / Size(mm) | Acceptable Qty | | | |
| | | | A | B | C | |
| | | Φ≤0.15 | Ignore | | Ignore | |
| | | 0.15<Φ≤0.20 | 2 | | | |
| | | 0.20<Φ≤0.30 | 1 | | | |
| | | Φ>0.30 | 0 | | | |
| | **Dim Spots**<br>Circle shaped and dim edged defects | 3 | | | | Minor |
| | | Zone / Size(mm) | Acceptable Qty | | | |
| | | | A | B | C | |
| | | Φ≤0.2 | Ignore | | Ignore | |
| | | 0.20<Φ≤0.40 | 2 | | | |
| | | 0.40<Φ≤0.60 | 1 | | | |
| | | Φ>0.60 | 0 | | | |

## 4.2 Cosmetic Defect

<table>
<tr><th>Item No</th><th>Items to be inspected</th><th>Inspection Standard</th><th>Classification of defects</th></tr>
<tr><td rowspan="6">4.2.2</td><td rowspan="6">Line defect<br>Black line, White line, Foreign material on polarizer</td><td>
<table>
<tr><td colspan="2">Size(mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td rowspan="2">L(Length)</td><td rowspan="2">W(Width)</td><td colspan="3">Zone</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Ignore</td><td>W≤0.01</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>L≤3.0</td><td>0.01＜W≤0.03</td><td colspan="2">2</td></tr>
<tr><td>L≤3.0</td><td>0.03＜W≤0.05</td><td colspan="2">1</td></tr>
<tr><td></td><td>W＞0.05</td><td colspan="2">0</td></tr>
</table>
</td><td rowspan="6">Minor</td></tr>
<tr><td rowspan="5">Foreign material on TP film</td><td>The line can be seen after mobile phone in the operating condition:
<table>
<tr><td colspan="2">Size(mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td rowspan="2">L(Length)</td><td rowspan="2">W(Width)</td><td colspan="3">Zone</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Ignore</td><td>W≤0.03</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>L≤5.0</td><td>0.03＜W≤0.05</td><td colspan="2">3</td></tr>
<tr><td></td><td>W＞0.05</td><td colspan="2">0</td></tr>
</table>
</td><td rowspan="5">Minor</td></tr>
<tr><td rowspan="4">4.2.3</td><td rowspan="4">Dim line defect<br>Polarizer scratch<br>TP film scratch</td><td>If the scratch can be seen after mobile phone cover assembling or in the operating condition, judge by the line defect of 4.2.2.<br>If the scratch can be seen only in non-operating condition or some special angle, judge by the following.
<table>
<tr><td colspan="2">Size(mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td rowspan="2">L(Length)</td><td rowspan="2">W(Width)</td><td colspan="3">Zone</td></tr>
<tr><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Ignore</td><td>W≤0.03</td><td colspan="2">Ignore</td><td rowspan="4">Ignore</td></tr>
<tr><td>5.0＜L≤10.0</td><td>0.03＜W≤0.05</td><td colspan="2">2</td></tr>
<tr><td>L≤5.0</td><td>0.05＜W≤0.08</td><td colspan="2">1</td></tr>
<tr><td></td><td>W＞0.08</td><td colspan="2">0</td></tr>
</table>
</td><td rowspan="4">Minor</td></tr>
<tr><td rowspan="4">4.2.4</td><td rowspan="4">Polarize Air bubble</td><td>Air bubbles between glass & polarizer
<table>
<tr><td>Zone<br>Size(mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td></td><td>A</td><td>B</td><td>C</td></tr>
<tr><td>Φ≤0.25</td><td colspan="2">Ignore</td><td rowspan="3">Ignore</td></tr>
<tr><td>0.25＜Φ≤0.5</td><td colspan="2">2</td></tr>
<tr><td>Φ＞0.50</td><td colspan="2">0</td></tr>
</table>
</td><td rowspan="4">Minor</td></tr>
</table>

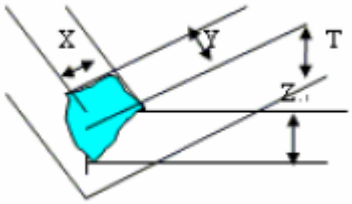
| Item No | Items to be inspected | Inspection Standard | Classification of defects |
|---|---|---|---|
| 4.35 | Glass defect | (i) Chips on corner<br>A:LCD Glass defect | Minor |




| X(mm) | Y(mm) | Z(mm) |
|---|---|---|
| ≤2.0 | ≤S | Disregard |

Notes: S=contact pad length
Chips on the corner of terminal shall not be allowed to extend into the ITO pad or expose perimeter seal.

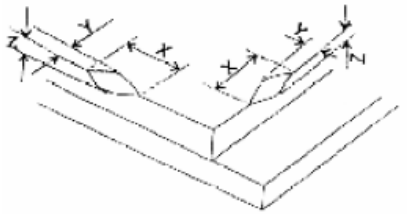
B:TP Glass defect




| X(mm) | Y(mm) | Z(mm) |
|---|---|---|
| ≤3.0 | ≤3.0 | Disregard |

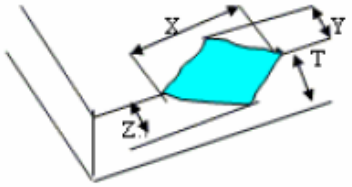
(ii)Usual surface cracks

A:LCD Glass defect




| X(mm) | Y(mm) | Z(mm) |
|---|---|---|
| ≤3.0 | <Inner border line of the seal | Disregard |

B:TP Glass defect




| X(mm) | Y(mm) | Z(mm) |
|---|---|---|
| ≤6.0 | <2.0 | Disregard |

(iii) Crack

Cracks tend to break are not allowed.