

深圳市尚视界科技有限公司

产品说明书

MODEL NO.: SX177-QQVGA20P-03-V01

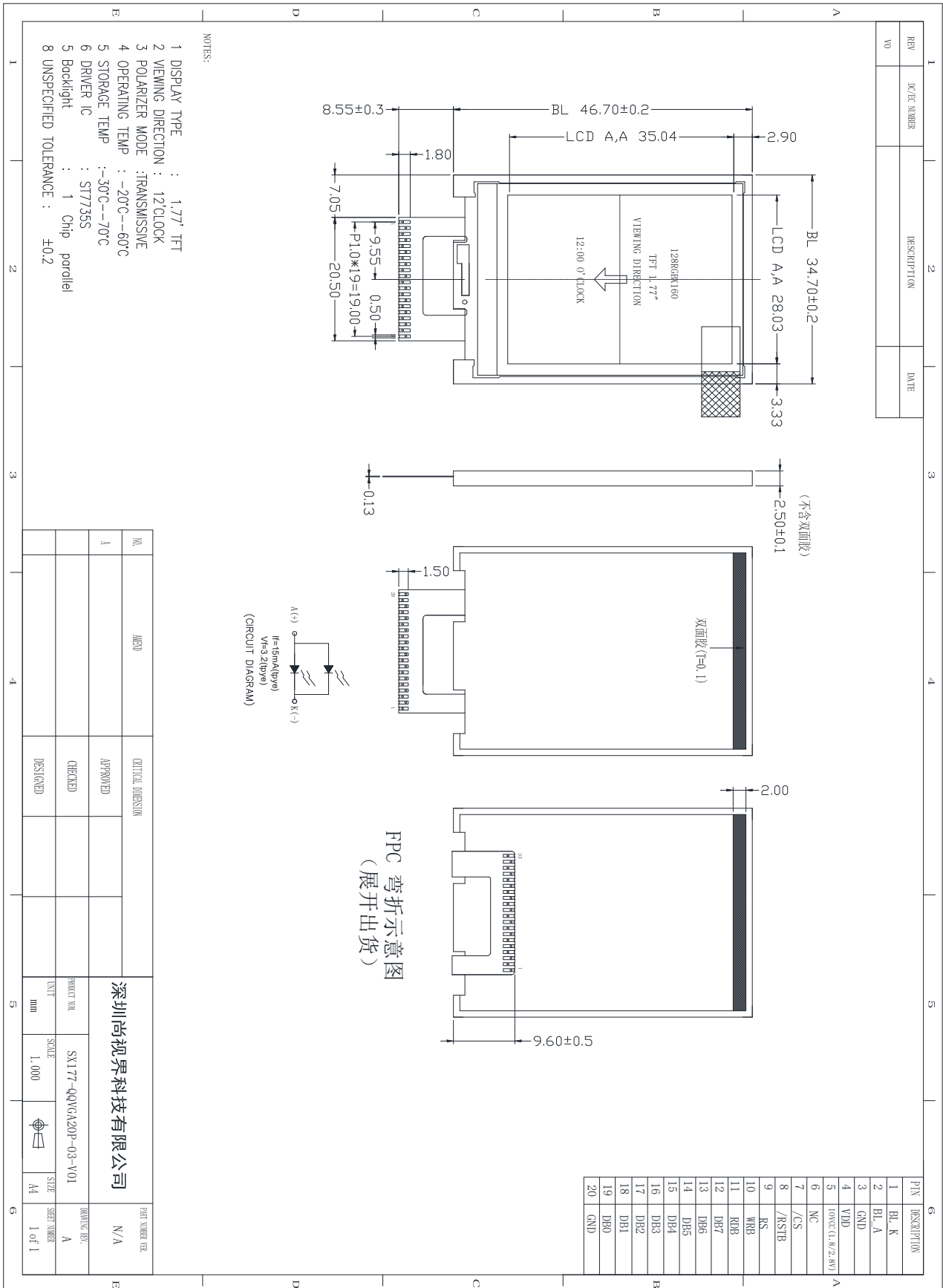
| | |
|---------------------|-------|
| Customer: | _____ |
| Approved by: | _____ |
| Note: | _____ |

| Prepared | Approved | Checked | Date |
|----------|----------|---------|------|
| | | | |

1. GENERAL INFORMATION

| Item of general information | Contents | Unit |
|-----------------------------|--------------------------------|--------------------------|
| LCD type | 1.77" TFT | / |
| Viewing direction | 12 | O' Clock |
| Module size (W×H×T) | 34.7×46.7×2.5 | mm |
| Active area (W×H) | 28.03×35.04 | mm |
| Number of Dots | 128(RGB)×160 | / |
| Driver IC | ST7735S | |
| Interface Type | System parallel Interface | / |
| Input voltage | 2.8 -3.3V | Module Power consumption |
| Module Power consumption | TBD | mw |
| Colors | 262K | / |
| Back light type/Color | 2 White LED In parallel | / |
| System interface mode | 8 bit[0: 7] | / |

2. EXTERNAL DIMENSIONS



3. ABSOLUTE MAXIMUM RATINGS

极限参数

| Parameter of absolute maximum ratings 参数 | Symbol 符号 | Min 最小值 | Max 最大值 | Unit 单位 |
|--|-----------|---------|----------------|---------|
| Supply voltage for logic 逻辑电压 | VCI | -0.3 | 4.6 | V |
| Input voltage 输入电压 | VCC | -0.3 | IOVCC+0.3 | V |
| Operating temperature 操作温度 | Top | -10 | 60 | °C |
| Storage temperature 储存温度 | TST | -20 | 70 | °C |
| Humidity 湿度 | RH | - | 90%(Max60 ° C) | RH |

4. ELECTRICAL CHARACTERISTICS 模块电气特性

4.1 Typical operation conditions

| Parameter of DC characteristics 参数 | Symbol 符号 | Min 最小值 | Typ 典型值 | Max 最大值 | Unit 单位 |
|------------------------------------|-----------------|-----------|---------|----------|---------|
| Supply voltage for logic 逻辑电压 | VCC/VCI | 2.7 | 2.8 | 2.9 | V |
| I/O power supply 接口电压 | IOVCC | 1.7/2.7 | 1.8/2.8 | 1.9/2.9 | V |
| Input Current 输入电流 | I _{dd} | - | TBD | TBD | mA |
| Input voltage 'H' level 输入高电平 | V _{IH} | 0.78IOVCC | - | IOVCC | V |
| Input voltage 'L' level 输入低电平 | V _{IL} | -0.3 | - | 0.2IOVCC | V |
| Output voltage 'H' level 输出高电平 | V _{OH} | 0.8IOVCC | - | - | V |
| Output voltage 'L' level 输出低电平 | V _{OL} | - | -- | 0.2IOVCC | V |

4.2 TimingDiagram

Parallel Interface Characteristics: 18, 16, 9 or 8-bit Bus (8080 Series MCU Interface)

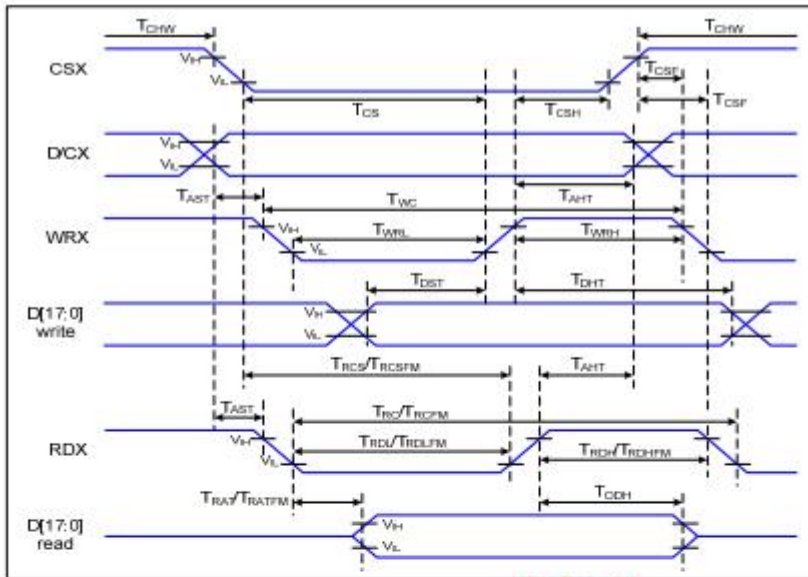


Figure 1 Parallel Interface Timing Characteristics (8080 Series MCU Interface)

T_a=25 °C, V_{DDI}=1.65~3.7V, V_{DD}=2.3~4.8V

| Signal | Symbol | Parameter | Min | Max | Unit | Description |
|----------|--------|------------------------------------|-----|-----|------|-------------------|
| D/CX | TAST | Address Setup Time | TBD | | ns | - |
| | TAHT | Address Hold Time (Write/Read) | TBD | | ns | |
| CSX | TCHW | Chip Select "H" Pulse Width | TBD | | ns | - |
| | TCS | Chip Select Setup Time (Write) | TBD | | ns | |
| | TRCS | Chip Select Setup Time (Read ID) | TBD | | ns | |
| | TRCSFM | Chip Select Setup time (Read FM) | TBD | | ns | |
| | TCSF | Chip Select Wait Time (Write/Read) | TBD | | ns | |
| | TCSH | Chip Select Hold Time | TBD | | ns | |
| WRX | TWC | Write Cycle | TBD | | ns | - |
| | TWRH | Control Pulse "H" Duration | TBD | | ns | |
| | TWRL | Control Pulse "L" Duration | TBD | | ns | |
| RDX (ID) | TRC | Read Cycle (ID) | TBD | | ns | When Read ID Data |
| | TRDH | Control Pulse "H" Duration (ID) | TBD | | ns | |
| | TRDL | Control Pulse "L" Duration (ID) | TBD | | ns | |

5. BACKLIGHT CHARACTERISTICS 背光电气特性

| Item of backlight characteristics 项目 | Symbol 符号 | Min 最小值 | Typ 典型值 | Max 最大值 | Unit 单位 | Condition 条件 |
|--------------------------------------|-----------|---------|----------|---------|---------|--------------------|
| Forward voltage 正向电压 | Vf | 2.8 | 3.2 | 3.4 | V | Ta=25°C If=40mA |
| Luminance 亮度 | Lv | - | | - | cd/m2 | |
| Number of LED 灯数 | - | - | 2 | - | Piece | |
| Connection mode 连接类型 | P | - | Parallel | - | | |

Using condition: constant current driving method If=40mA(+/-10%).

使用条件：恒流的驱动方式是If=40mA(+/-10%).

6. INTERFACE DESCRIPTION

| Interface NO. 接口序号 | Symbol 符号 | I/O or connect to 输入/出 或 连接到 | Description 描述 | When not in use 不用时 |
|--------------------|-----------|------------------------------|-----------------------------------|---------------------|
| 1 | LEDK | / | LED Cathode | / |
| 2 | LEDA | / | LED Anode | / |
| 3 | GND | 0V | Ground | |
| 4 | VDD | / | Power supply | |
| 5 | IOVCC | / | Power Supply for I/O System. | |
| 6 | NC | / | NC | |
| 7 | CS | / | Chip select input pin | |
| 8 | RESET | / | System Reset Pin | |
| 9 | RS | / | Data/Instruction select input pin | |
| 10 | WRB | / | Read/Write execution control pin | |
| 11 | RDB | / | Read/Write execution control pin | |
| 12 | DB7 | I/O | Data Bus | |
| 13 | DB6 | I/O | Data Bus | |
| 14 | DB5 | I/O | Data Bus | |
| 15 | DB4 | I/O | Data Bus | |
| 16 | DB3 | I/O | Data Bus | |
| 17 | DB2 | I/O | Data Bus | |
| 18 | DB1 | I/O | Data Bus | |
| 19 | DB0 | I/O | Data Bus | |
| 20 | GND | 0V | Ground | |

7. INSPECTION CRITERION 检查标准

This specification is made to be used as the standard acceptance/rejection criteria for our company TFT

product.

7.1 缺陷定义:

Major defect (重缺陷): 将使产品部分或全部丧失功能的缺陷.

Minor defect (轻缺陷): 有缺陷,但不导致功能不良或丧失.

7.2 抽样方案:

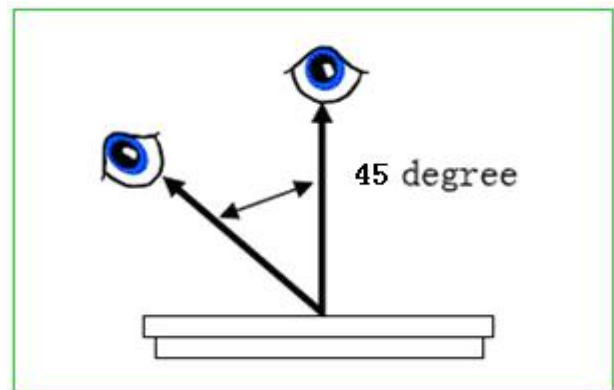
Sampling plan according to GB/T2828.1-2003/ISO 2859-1: 1999 and ANSI/ASQC Z1.4-1993,normal level 2 and based on: (按照GB/T 2828.1-2003 GB/T2828.1-2003/ISO 2859-1: 1999 and ANSI/ASQC Z1.4-1993正常检验一次抽样方案 Level II 对检验批判断可接受或拒绝:)

Major defect (重缺陷): AQL 0.65

Minor defect (轻缺陷): AQL 1.5

7.3 Inspection condition (检查条件)

Viewing distance for cosmetic inspection is about 30cm with bare eyes, and under an environment of 20~40W light intensity, all directions for inspecting the sample should be within 45° against perpendicular line (在20~40W 日光灯的光照环境下, 被检查样品放在离日光灯80+/-20cm、离检查者眼睛35+/-5cm (垂直) 45 度区域内的观察)



7.4 LCD区域定义:

Zone A: character/Digit area

Zone B: viewing area except Zone A (Zone A + Zone B=minimum Viewing area)

Zone C: Outside viewing area (invisible area after assembly in customer's product)

Fig.1 Inspection zones in an LCD.

Note: As a general rule, visual defects in Zone C are permissible, when it is no trouble for quality and assembly of customer's product.

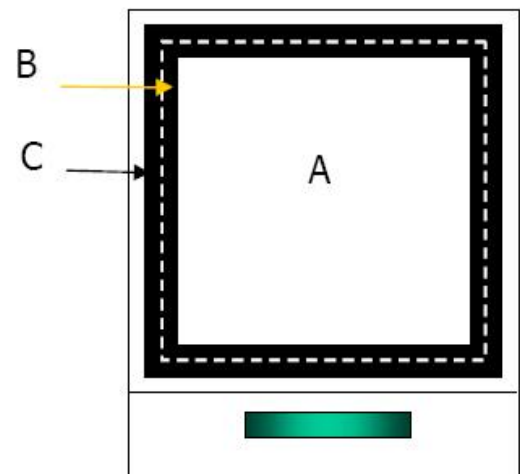
区域A: 字符/数字显示区

区域B: VA区/视区 (虚线内, A区外)

(A区+B区=装机壳后可视区域, 具体尺寸参照LCM图纸上所标示的VA区)

区域C: 视区外围,手机外壳装配后模块看不见区域。

注: 在区域C看得见的外观缺陷, 不影响顾客产品组装, 允许出货。



7.5 检验标准



5.1 Major 重缺陷

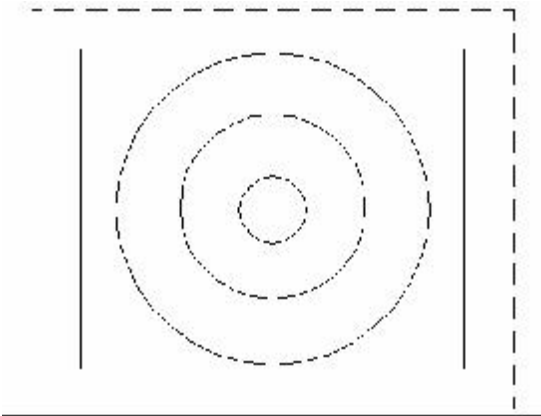
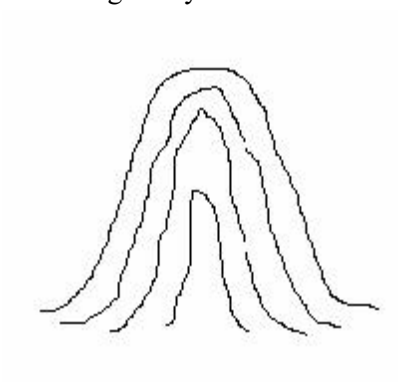
| 序号 | 检验项目 | 检验标准 | 缺陷等级 |
|-------|------------------------------------|--|------|
| 7.5.1 | All unfunctional defects 所有功能缺陷 | 1) No response (不显示、显示异常) 2). No missing line (断笔、漏笔、短路) 3) backlight anomaly(背光不亮, 或点亮不正常、闪烁) | 重缺陷 |

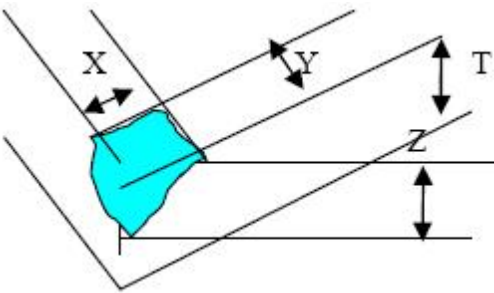
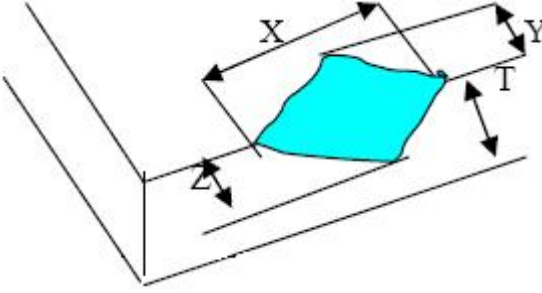
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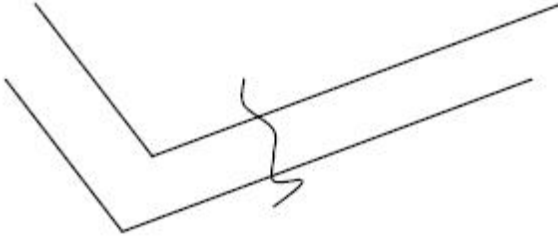
| | | | |
|-------|------------------------|---|--|
| | | 4) No stroke excursion(TP 不触摸) | |
| 7.5.2 | Miss 遗漏 | Can not miss any component 缺少元器件, 影响产品功能 | |
| 7.5.3 | Outline dimension 尺寸超出 | Overall outline dimension beyond the drawing is not allowed. 模块外观尺寸超出图纸上的规格值 | |

7.6 Cosmetic Defect 外观缺陷:

| 序号 | Inspection Item 检验项目 | Inspection Standard 检查标准 | Classification of defects 等级 | | | | | | | | |
|--|--|--|------------------------------|---|--|---------------|-------------|-----------------------|---|---|-------------|
| 7.6.1 | Black and white Spot defect Foreign Particle, 清晰点 黑、白点缺陷 针孔,异物, 偏光片下污点 TP 污点 | 点状缺陷Φ的定义: $\Phi = (x + y) / 2$  | Minor | | | | | | | | |
| | | <table border="1" style="width: 100%; text-align: center;"> <tr> <th style="width: 30%;">Zone 区域</th> <th colspan="3">Acceptable Qty 最多允许数量</th> </tr> <tr> <th>尺寸 Size(mm)</th> <th>A</th> <th>B</th> <th>C</th> </tr> </table> | | Zone 区域 | Acceptable Qty 最多允许数量 | | | 尺寸 Size(mm) | A | B | C |
| | | Zone 区域 | | Acceptable Qty 最多允许数量 | | | | | | | |
| | | 尺寸 Size(mm) | | A | B | C | | | | | |
| | | $\Phi \leq 0.15$ | | Ignore | | Ignore | | | | | |
| | | $0.15 < \Phi \leq 0.20$ | | 3 | | | | | | | |
| | | $0.2 < \Phi \leq 0.25$ | | 1 | | | | | | | |
| | | $\Phi > 0.20$ | | 0 | | | | | | | |
| | | | | DIM Spot 模糊点 圆扩散型 边缘模糊的点缺陷 TP DIRT 清晰点 | 点状缺陷Φ的定义: $\Phi = (x + y) / 2$  | Minor | | | | | |
| | | | | | <table border="1" style="width: 100%; text-align: center;"> <tr> <th style="width: 30%;">Zone 区域</th> <th colspan="3">Acceptable Qty 最多允许数量</th> </tr> <tr> <th>尺寸 Size(mm)</th> <th>A</th> <th>B</th> <th>C</th> </tr> </table> | | Zone 区域 | Acceptable Qty 最多允许数量 | | | 尺寸 Size(mm) |
| Zone 区域 | Acceptable Qty 最多允许数量 | | | | | | | | | | |
| 尺寸 Size(mm) | A | | B | | C | | | | | | |
| $\Phi \leq 0.2$ | Ignore | | Ignore | | | | | | | | |
| $0.20 < \Phi \leq 0.60$ | 4 | | | | | | | | | | |
| $0.60 < \Phi \leq 0.80$ | 2 | | | | | | | | | | |
| $0.80 < \Phi \leq 1.0$ | 1 | | | | | | | | | | |
| $1.0 \leq \Phi$ | 0 | | | | | | | | | | |
| <table border="1" style="width: 100%; text-align: center;"> <tr> <th style="width: 30%;">Zone 区域</th> <th colspan="3">Acceptable Qty 最多允许数量</th> </tr> <tr> <th>尺寸 Size(mm)</th> <th>A</th> <th>B</th> <th>C</th> </tr> </table> | Zone 区域 | | Acceptable Qty 最多允许数量 | | | | 尺寸 Size(mm) | A | B | C | |
| Zone 区域 | Acceptable Qty 最多允许数量 | | | | | | | | | | |
| 尺寸 Size(mm) | A | B | C | | | | | | | | |
| $\Phi \leq 0.15$ | Ignore | | Ignore | | | | | | | | |
| $0.15 < \Phi \leq 0.2$ | 3 | | | | | | | | | | |
| $0.2 < \Phi \leq 0.25$ | 2 | | | | | | | | | | |
| $\Phi > 0.20$ | 0 | | | | | | | | | | |

| 7.6.2 | Newton ring 牛顿环 | <p>1. Regularity</p> <p>a. The area of the Newton rings is more than 1/3 area of the touch panel. It's NG.</p> <p>b. The area of the Newton rings is less than 1/3 area of the touch panel; and no character affected and line distorted after touch panel lightening. It's ok.</p> <div style="text-align: center;">  </div> <p>2. Non-regularity</p> <div style="text-align: center;">  </div> <p>a. The area of the Newton ring is more than the 1/2 area of touch panel without lightening. It's NG.</p> <p>b. If it makes the character and line distorted with T/P lightening, any ring is NG.</p> <p>c. The area of the Newton ring is less than the 1/2 area of touch panel with lightening. And no character affected and line distorted. it's OK</p> <p>在特定光线下可见。 呈规则圆环形状，允许面积小于触摸屏总面积1/3。 呈不规则形状，允许面积小于触摸屏总面积1/2</p> | Minor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|--|--|----------|--------|----------------|--|--|-----------|----------|------|--|--|---|---|---|--------|---------------|--------|--|--------|--------------|----------------------|---|--|--------------|----------------------|---|--|--|------------|-----------------------|--|-------|
| 7.6.2 | Black line, White line, Foreign material under film, | <p>Inspection Standard 检查标准</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #ffffcc;"> <th colspan="2">Size(mm)</th> <th colspan="3">Acceptable Qty</th> </tr> </thead> <tbody> <tr> <th rowspan="2">L(Length)</th> <th rowspan="2">W(Width)</th> <th colspan="3">Zone</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> <tr> <td>Ignore</td> <td>$W \leq 0.01$</td> <td colspan="2">Ignore</td> <td rowspan="4">Ignore</td> </tr> <tr> <td>$L \leq 3.0$</td> <td>$0.01 < W \leq 0.03$</td> <td colspan="2">2</td> </tr> <tr> <td>$L \leq 2.0$</td> <td>$0.03 < W \leq 0.05$</td> <td colspan="2">1</td> </tr> <tr> <td></td> <td>$0.05 < W$</td> <td colspan="2">Define as spot defect</td> </tr> </tbody> </table> | Size(mm) | | Acceptable Qty | | | L(Length) | W(Width) | Zone | | | A | B | C | Ignore | $W \leq 0.01$ | Ignore | | Ignore | $L \leq 3.0$ | $0.01 < W \leq 0.03$ | 2 | | $L \leq 2.0$ | $0.03 < W \leq 0.05$ | 1 | | | $0.05 < W$ | Define as spot defect | | Minor |
| Size(mm) | | Acceptable Qty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L(Length) | W(Width) | Zone | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | A | B | C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ignore | $W \leq 0.01$ | Ignore | | Ignore | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $L \leq 3.0$ | $0.01 < W \leq 0.03$ | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $L \leq 2.0$ | $0.03 < W \leq 0.05$ | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | $0.05 < W$ | Define as spot defect | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| 7.6.3 | Film scratch | <p>If the film scratch can be after mobile phone cover assembling or in the operating condition, judge by the line defect of 4.2.2.</p> <p>If the film scratch can be seen only in non-operating condition or some special angle, judge by the following.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr style="background-color: #ffffcc;"> <th colspan="2">Size(mm)</th> <th colspan="3">Acceptable Qty</th> </tr> <tr> <th rowspan="2">L(Length)</th> <th rowspan="2">W(Width)</th> <th colspan="3">Zone</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>Ignore</td> <td>$W \leq 0.03$</td> <td colspan="2">Ignore</td> <td rowspan="4" style="text-align: center; vertical-align: middle;">Ignore</td> </tr> <tr> <td>$5.0 < L \leq 10.0$</td> <td>$0.03 < W \leq 0.05$</td> <td colspan="2" style="text-align: center;">2</td> </tr> <tr> <td>$L \leq 5.0$</td> <td>$0.05 < W \leq 0.07$</td> <td colspan="2" style="text-align: center;">1</td> </tr> <tr> <td></td> <td>$0.07 < W$</td> <td colspan="2" style="text-align: center;">0</td> </tr> </tbody> </table> | Size(mm) | | Acceptable Qty | | | L(Length) | W(Width) | Zone | | | A | B | C | Ignore | $W \leq 0.03$ | Ignore | | Ignore | $5.0 < L \leq 10.0$ | $0.03 < W \leq 0.05$ | 2 | | $L \leq 5.0$ | $0.05 < W \leq 0.07$ | 1 | | | $0.07 < W$ | 0 | | |
|---------------------|----------------------|--|----------|--------|----------------|------------|------------|-----------|----------|------|--|--|---|---|---|--------|---------------|--------|--|--------|---------------------|----------------------|---|--|--------------|----------------------|---|--|--|------------|---|--|--|
| Size(mm) | | Acceptable Qty | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L(Length) | W(Width) | Zone | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | A | B | C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ignore | $W \leq 0.03$ | Ignore | | Ignore | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $5.0 < L \leq 10.0$ | $0.03 < W \leq 0.05$ | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $L \leq 5.0$ | $0.05 < W \leq 0.07$ | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | $0.07 < W$ | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7.6.4 | Glass defect | <p>(1) Chips on corner</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>X(mm)</th> <th>Y(mm)</th> <th>Z(mm)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">≤ 3.0</td> <td style="text-align: center;">≤ 3.0</td> <td style="text-align: center;">$Z < T$</td> </tr> </tbody> </table> | X(mm) | Y(mm) | Z(mm) | ≤ 3.0 | ≤ 3.0 | $Z < T$ | | | | | | | | | | | | | | | | | | | | | | | | | |
| X(mm) | Y(mm) | Z(mm) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ≤ 3.0 | ≤ 3.0 | $Z < T$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7.6.5 | Glass deect | <p>(2) Usual surface cracks</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>X(mm)</th> <th>Y(mm)</th> <th>Z(mm)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">≤ 6.0</td> <td style="text-align: center;">< 2.0</td> <td style="text-align: center;">$Z < T$</td> </tr> </tbody> </table> | X(mm) | Y(mm) | Z(mm) | ≤ 6.0 | < 2.0 | $Z < T$ | | | | | | | | | | | | | | | | | | | | | | | | | |
| X(mm) | Y(mm) | Z(mm) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ≤ 6.0 | < 2.0 | $Z < T$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7.6.6 | Glass deect | <p>(3) Crack</p> <p>Cracks tending to break are not allowed.</p> | Major | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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