

# Shenzhen Leadtek Electronics Co.,Ltd

## PRODUCT SPECIFICATION

### TFT-LCD MODULE


**Module No: LTK078QFHCT16-V0**

Preliminary Specification

Approval Specification

| Designed by | Checked by | Approved by |
|-------------|------------|-------------|
| <i>jona</i> | <i>tom</i> | <i>lan</i>  |

### Final Approval by Customer

| Approved by | Comment   |
|-------------|---|
|             | <div style="border: 1px solid black; padding: 5px; text-align: center;"><p>Distributed by:</p><p><a href="http://www.texim-europe.com">www.texim-europe.com</a></p></div> |

※The specification of "TBD" should refer to the measured value of sample . If there is difference between the design specification and measured value, we naturally shall negotiate and agree to solution with customer.



# 1. Document Revision History

| Version | Contents        | Date       | Note |
|---------|-----------------|------------|------|
| V0      | Initial version | 2024.08.16 |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |
|         |                 |            |      |



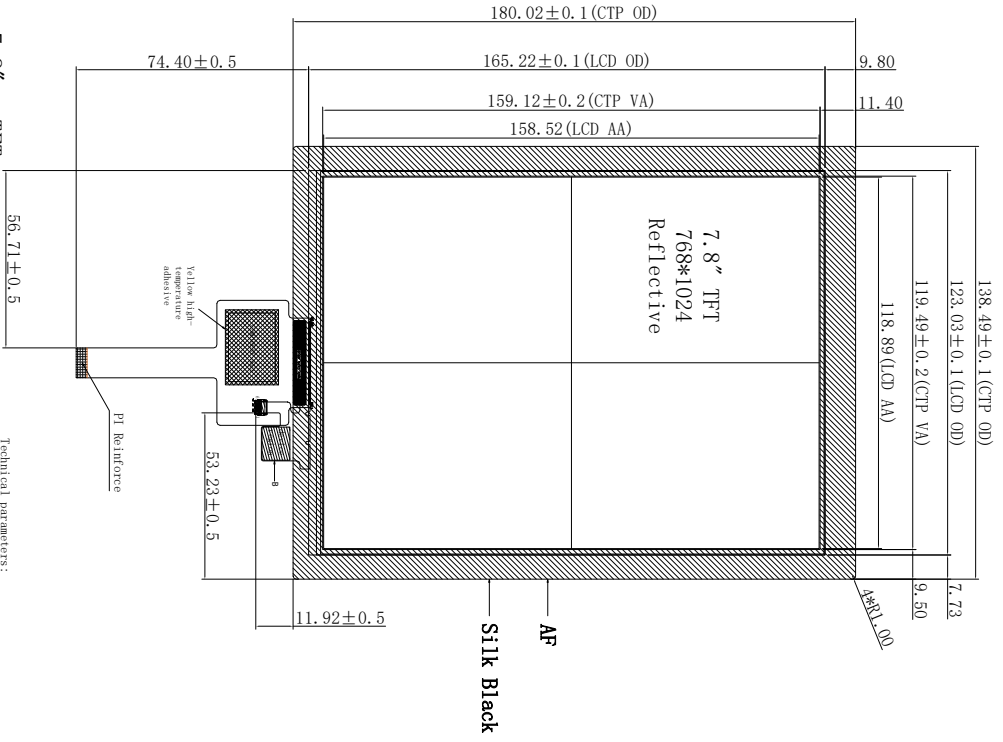
## 2. General Description

| NO | Item                | Specification               | Unit  |
|----|---------------------|-----------------------------|-------|
| 1  | LCD Size            | TFT"7.8                     | inch  |
| 2  | Panel Type          | TN                          | mm    |
| 3  | Display Resolution  | 768 x RGB x 1024            | pixel |
| 4  | Display Mode        | Normally White/Reflective   | -     |
| 5  | Number of Colors    | 16.7M                       | -     |
| 6  | Viewing Direction   | 60/60/60/60                 | -     |
| 7  | CTP+LCM Module size | 138.49(W)×180.02(H)×2.55(T) | mm    |
| 8  | Active Area         | 118.89(W)×158.52(H)         | mm    |
| 9  | Pixel Pitch         | 0.1548(H) × 0.1548(V)       | mm    |
| 10 | LCM Driver          | -                           |       |
| 11 | Light Source        | White LED                   |       |
| 12 | LCM Interface       | MIPI                        | bit   |

Note : Please refer to the mechanical drawing

## 3. Mechanical Drawing

# Front View

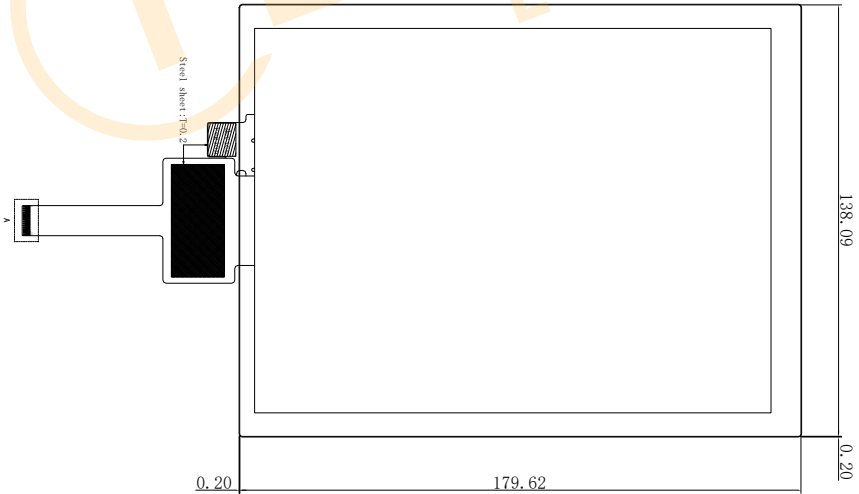


- Notes:
1. Display : 7.8", TFT
  2. Resolution: 768xRGBx1024
  3. LCD Viewing Direction: 60/60/60/60
  4. Drive IC: J99365D
  5. Display Mode: Normally White
  6. unmark Tolerance: ±0.2
  7. OPERATING TEMP: -20° C ~ +60° C
  8. STORAGE TEMP: -30° C ~ +70° C
  9. Requirements on Environmental Protection: ROHS

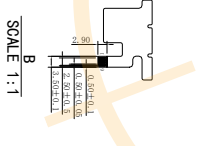
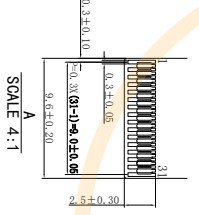
# Side View



# Back View



- Technical parameters:
1. Structure: GFF; Transmittance (VA region) ≥86%;
  2. IC model: G79271
  3. CG material: Asahi Glass F-1, 1mm.
  4. Surface hardness ≥6H(750gf).
  5. CS ≥450µm, DV1 ≥8µm, 4µm ≥450µm.
  6. Drop ball test: 64g steel ball, 50cm height.
  7. Center point three times, no crushing;
  8. Ink Dye value: ≥32
  9. No tolerance ±0.2mm, with \* as the key monitoring ruler;



**CTP PIN**

| PIN | NAME  |
|-----|-------|
| 1   | VDD   |
| 2   | GND   |
| 3   | INT   |
| 4   | RESET |
| 5   | SDA   |
| 6   | SCL   |

**Display Pin Interface**

|    |           |
|----|-----------|
| 1  | GND       |
| 2  | TOUCH_3V3 |
| 3  | GND       |
| 4  | TOUCH_INT |
| 5  | TOUCH_RST |
| 6  | TOUCH_SDA |
| 7  | TOUCH_SCL |
| 8  | GND       |
| 9  | LED K     |
| 10 | LED A     |
| 11 | TE        |
| 12 | RSTN      |
| 13 | NC        |
| 14 | IOVCC_3V3 |
| 15 | VCC_3V3   |
| 16 | GND       |
| 17 | D3P       |
| 18 | D3N       |
| 19 | GND       |
| 20 | D2P       |
| 21 | D2N       |
| 22 | GND       |
| 23 | CKP       |
| 24 | CKN       |
| 25 | GND       |
| 26 | D1P       |
| 27 | D1N       |
| 28 | GND       |
| 29 | D0P       |
| 30 | D0N       |
| 31 | GND       |

**LEADTEK DISPLAY**

Shenzhen Leadtek Electronics Co., Ltd

SCALE: 1/1 UNIT: mm PAGE: 1/1

Part No: LTK078QFICT16 VER: V0

Customer No: \_\_\_\_\_

Customer Name: \_\_\_\_\_

DATE: 2024.08.20

SCALE: 1:1

| REV | DESCRIPTION | DATE       | NAME |
|-----|-------------|------------|------|
| 3   |             |            |      |
| 2   |             |            |      |
| 1   | NEW         | 2024.08.20 | IAN  |

| SCALE: 1/1   | UNIT: mm      | PAGE: 1/1 | Approve | Check | Drawn |
|--------------|---------------|-----------|---------|-------|-------|
| Part No:     | LTK078QFICT16 | VER: V0   | Kevin   | Jona  | IAN   |
| Customer No: |               |           |         |       |       |

## 2.0 Interface pin define

### LCM Interface PIN Define:

| Pin No. | Symbol    | Description                                       | Remark |
|---------|-----------|---|--------|
| 1       | GND       | Power Ground                                      |        |
| 2       | TOUCH_3V3 | CTP power supply input.                           |        |
| 3       | GND       | Power Ground                                      |        |
| 4       | TOUCH_INT | CTP interrupt line.                               |        |
| 5       | TOUCH_RST | CTP reset line.                                   |        |
| 6       | TOUCH_SDA | CTP I2C data line.                                |        |
| 7       | TOUCH_SCL | CTP I2C clock line.                               |        |
| 8       | GND       | Power Ground                                      |        |
| 9       | LEDK      | No connect  |        |
| 10      | LEDA      | No connect  |        |
| 11      | TE        | Tearing Effect Output Pin TE                      |        |
| 12      | RESET     | Global reset signal(Follow IOVCC voltage)         |        |
| 13      | NC        | No connect  |        |
| 14      | IOVCC_1V8 | Digital power=1.8V                                |        |
| 15      | VCC_3V3   | Power supply=2.8-3.3V                             |        |
| 16      | GND       | Power Ground                                      |        |
| 17      | D3P       | MIPI-D3Pare differential small amplitude signals  |        |
| 18      | D3N       | MIPI-D3Nare differential small amplitude signals  |        |
| 19      | GND       | Power Ground                                      |        |
| 20      | D2P       | MIPI-D2Pare differential small amplitude signals  |        |
| 21      | D2N       | MIPI-D2Nare differential small amplitude signals  |        |
| 22      | GND       | Power Ground                                      |        |
| 23      | CLKP      | MIPI-CLKPare differential small amplitude signals |        |
| 24      | CLKN      | MIPI-CLKNare differential small amplitude signals |        |
| 25      | GND       | Power Ground                                      |        |
| 26      | D1P       | MIPI-D1Pare differential small amplitude signals  |        |
| 27      | D1N       | MIPI-D1Nare differential small amplitude signals  |        |
| 28      | GND       | Power Ground                                      |        |

|    |     |  |  |
|----|-----|--|--|
| 29 | D0P | MIPI-D0Pare differential small amplitude signals |  |
| 30 | D0N | MIPI-D0Nare differential small amplitude signals |  |
| 31 | GND | Power Ground                                     |  |

## 4. Operation Specifications

### 4.1 Absolute Maximum Ratings

Electrical Maximum Ratings (VSS=0V)

| Parameter            | Symbol | Min. | Max. | Unit | Note |
|----------------------|--------|------|------|------|------|
| Power supply voltage | VDD3V3 | 2.8  | 3.3  | V    |      |
|                      | IOVCC  | 1.65 | 3.3  | V    |      |

Note: 1. VCI, GND must be maintained.

2. The modules may be destroyed if they are used beyond the absolute maximum ratings.

3. Ta=25+/-2.

### 4.2. 1 Electrical Specifications(Typical Operation Conditions, At Ta = 25 °C)

| ITEM                 | SYMBOL | MIN | TYP | MAX | UNIT | NOTE |
|----------------------|--------|-----|-----|-----|------|------|
| Power Supply Voltage | IOVCC  | 1.7 | 1.8 | 1.8 | V    | -    |
|                      | VDD3V3 | 2.8 | 3.3 | 3.3 | V    | -    |

## 5.0. AC characteristics

### 5.1. Reset input timings

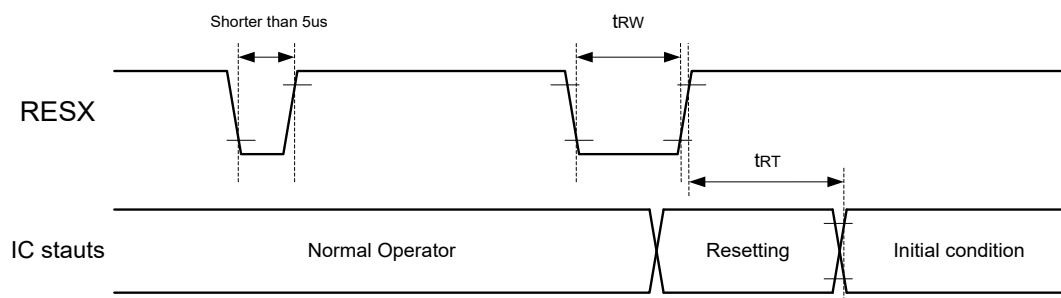


Figure 11.1: Reset input timings

| Symbol   | Parameter                          | Related pins | Min. | Max.               | Unit    |
|----------|------------------------------------|--------------|------|--------------------|---------|
| $t_{RW}$ | Reset pulse width <sup>(2)</sup>   | RESX         | 10   | -                  | $\mu s$ |
| $t_{RT}$ | Reset complete time <sup>(3)</sup> | -            | -    | 5<br>(Note 5)      | ms      |
|          |                                    | -            | -    | 120<br>(Note 6, 7) | ms      |

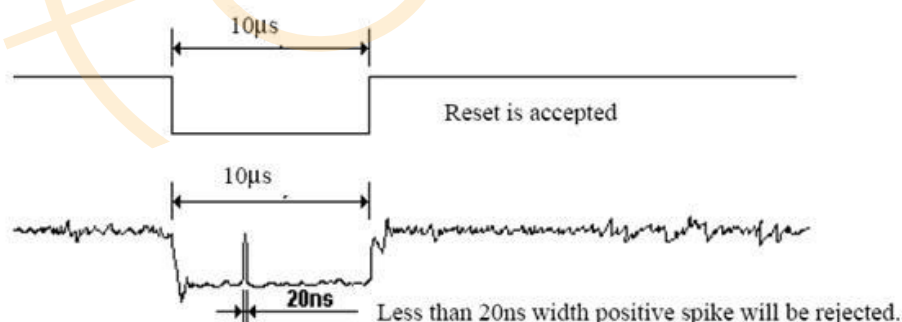
**Note:** (1) The reset complete time also required time for loading ID bytes from OTP to registers. This loading is done every time when there is HW reset cancel time ( $t_{RT}$ ) within 5 ms after a rising edge of RESX.

(2) Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the table below.

| RESX Pulse                       | Action         |
|----------------------------------|----------------|
| Shorter than 5 $\mu s$           | Reset Rejected |
| Longer than 10 $\mu s$           | Reset          |
| Between 5 $\mu s$ and 10 $\mu s$ | Reset Start    |

(3) During the resetting period, the display will be blanked (The display is entering blanking sequence, which maximum time is 120 ms, when Reset Starts in Sleep Out –mode. The display remains the blank state in Sleep In –mode) and then returns to Default condition for H/W reset.

(4) Spike Rejection also applies during a valid reset pulse as shown below:



(5) When Reset is applied during Sleep In Mode.

(6) When Reset is applied during Sleep Out Mode.

(7) It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.

(8) After Sleep Out Command, it is necessary to wait 120msec then send RESX.

Table 11.3: Reset timings

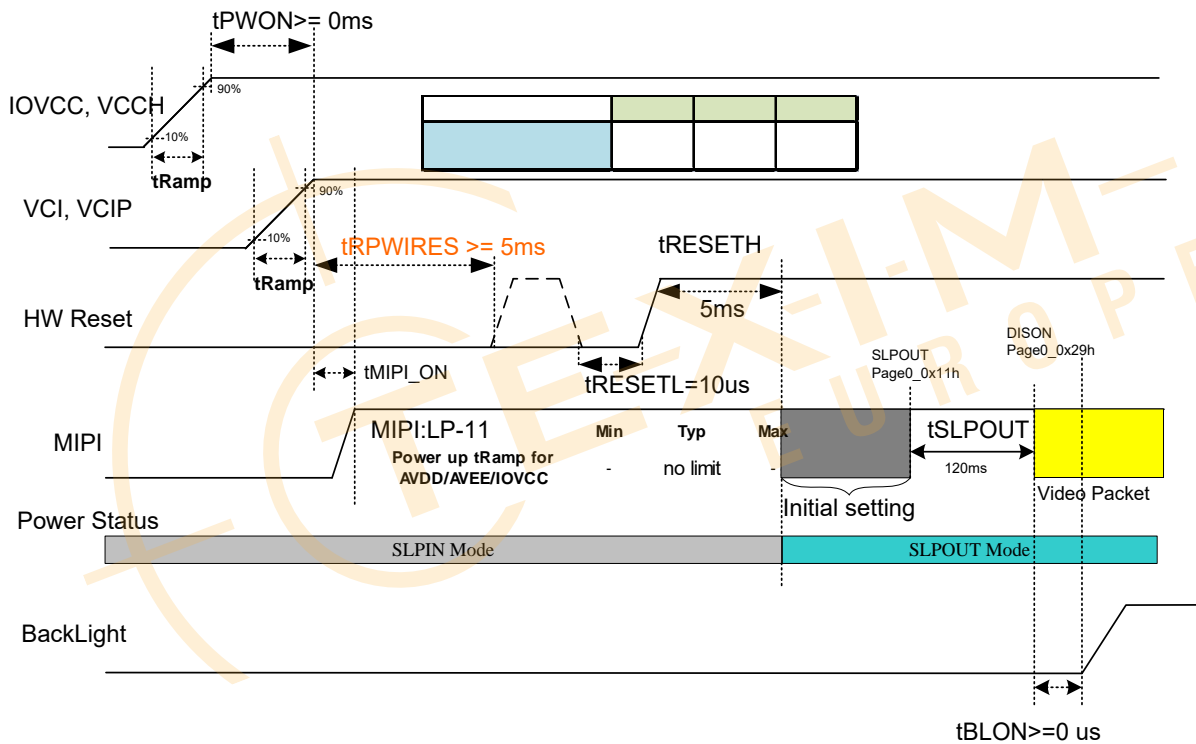
## 6.0. Power on sequence for differential power mode

| Symbol   | Min | Typ      | Max      | Unit | Remark |
|----------|-----|----------|----------|------|--------|
| tRamp    | -   | no limit | -        | us   |        |
| tPWON    | 0   | -        | -        | ms   |        |
| tON1     | 0   | -        | -        | ms   |        |
| tMIPI-ON | 0   | -        | tRPWIRES | ms   |        |
| tRPWIRES | 5   | -        | -        | ms   |        |
| tRESETL  | 10  | -        | -        | us   |        |
| tRESETH  | 5   | -        | -        | ms   |        |
| tSLPOUT  | 120 | -        | -        | ms   |        |
| tBLON    | 0   | -        | -        | ms   |        |

BOOSTM[1:0]=10 (Internal DC/DC power mode : Charge Pump, FP7721)

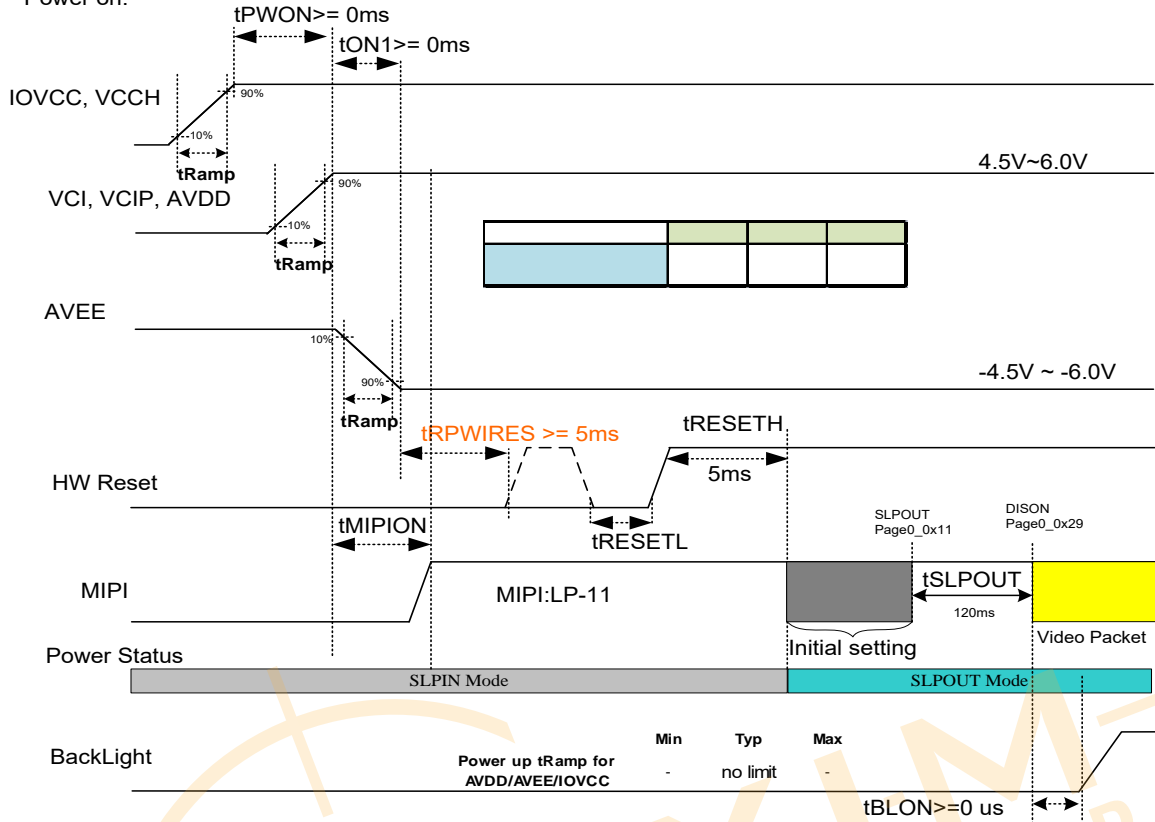
VCCD=IOVCC=VCCH=1.65V ~ 3.3V, VCI=VCIP=2.5V ~ 4.8V.

Power on:





BOOSTM[1:0]=01/11 (External AVDD/AVEE Power)  
 VCCD=IOVCC=VCCH=1.65V ~ 3.3V, AVDD=VCI=VCIP=4.5V ~ 6.0V, AVEE=-4.5V ~ -6.0V  
 Power on:



BOOSTM[1:0]=00 (External AVDD/AVEE/VGH/VGL)  
 IOVCC=VCCH=1.65V ~ 3.3V, VCI=VCIP=AVDD=4.5V ~ 6.0V, AVEE=-4.5V ~ -6.0V, VGH=7V~20V, VGL=-7V~-15V  
 Power on:

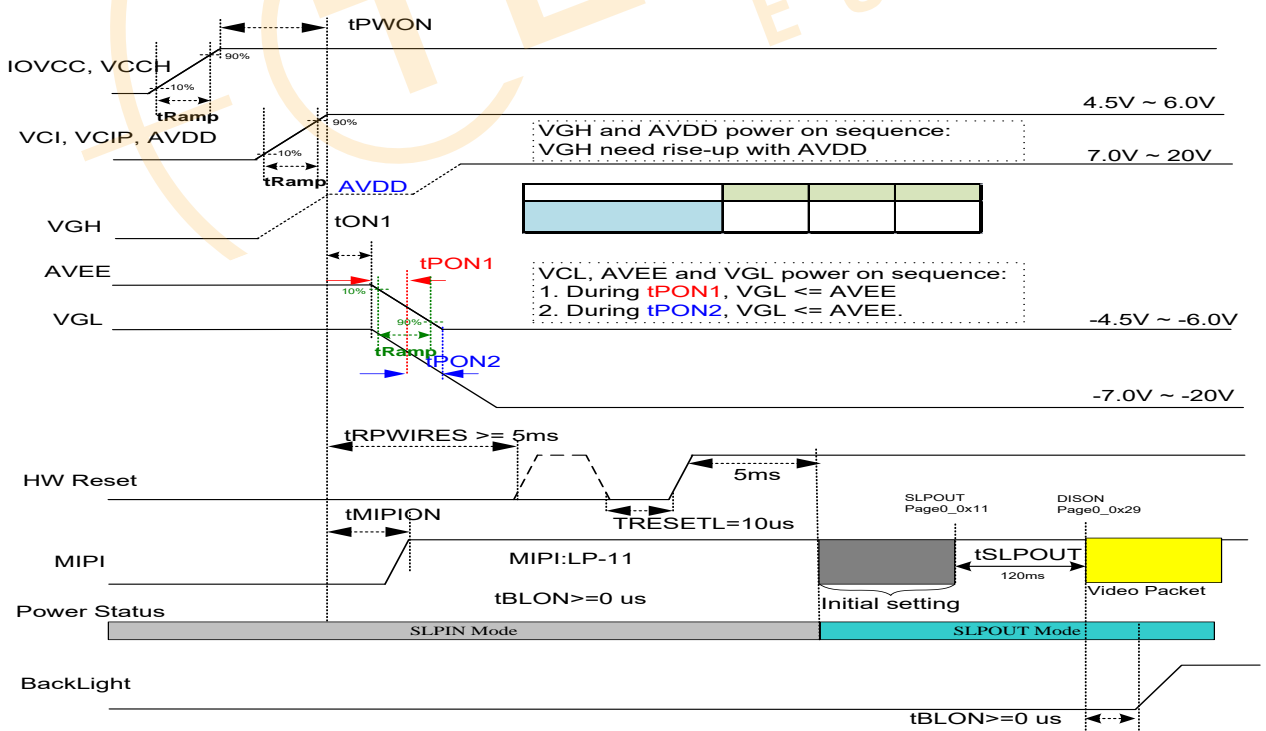


Figure 9.10: Power off sequence for differential power mode

Power off sequence for differential power mode

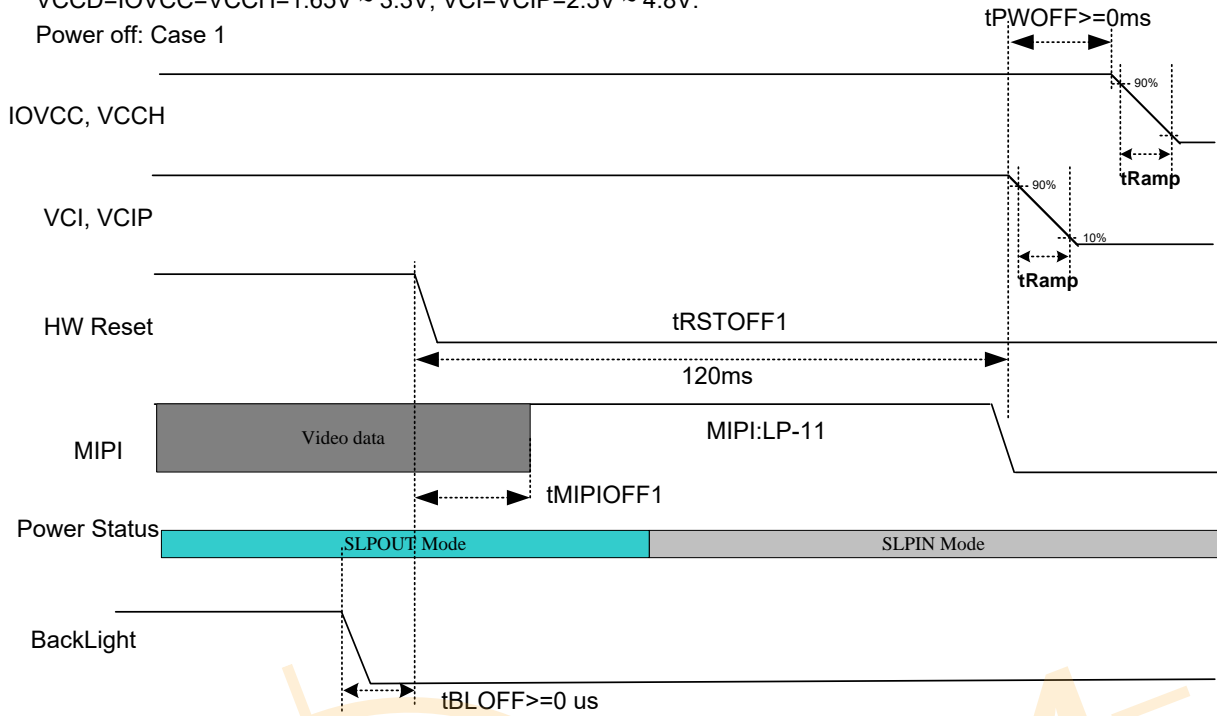
For the power off case2, DISOFF command and tDISOFF are optional. That means t<sub>CMD\_OFF</sub> could be followed by the SLPIN command and tSLPIN , without DISOFF command and tDISOFF.

| Symbol    | Min | Typ      | Max | Unit | Remark           |
|-----------|-----|----------|-----|------|------------------|
| tRamp     | -   | no limit | -   | us   |                  |
| tPWOFF    | 0   | -        | -   | ms   |                  |
| tPWOFF1   | 0   | -        | -   | ms   |                  |
| tPWOFF2   | 0   | -        | -   | ms   |                  |
| tMIPIOFF1 | 0   | -        | -   | ms   | power off case 1 |
| tRSTOFF1  | 120 | -        | -   | ms   | power off case 1 |
| tMIPIOFF2 | 0   | -        | -   | ms   | power off case 2 |
| tRSTOFF2  | 0   | -        | -   | ms   | power off case 2 |
| tCMD_OFF  | 1   | -        | -   | ms   | power off case 2 |
| tDISOFF   | 50  | -        | -   | ms   | power off case 2 |
| tSLPIN    | 100 | -        | -   | ms   | power off case 2 |
| tBLOFF    | 0   | -        | -   | ms   |                  |



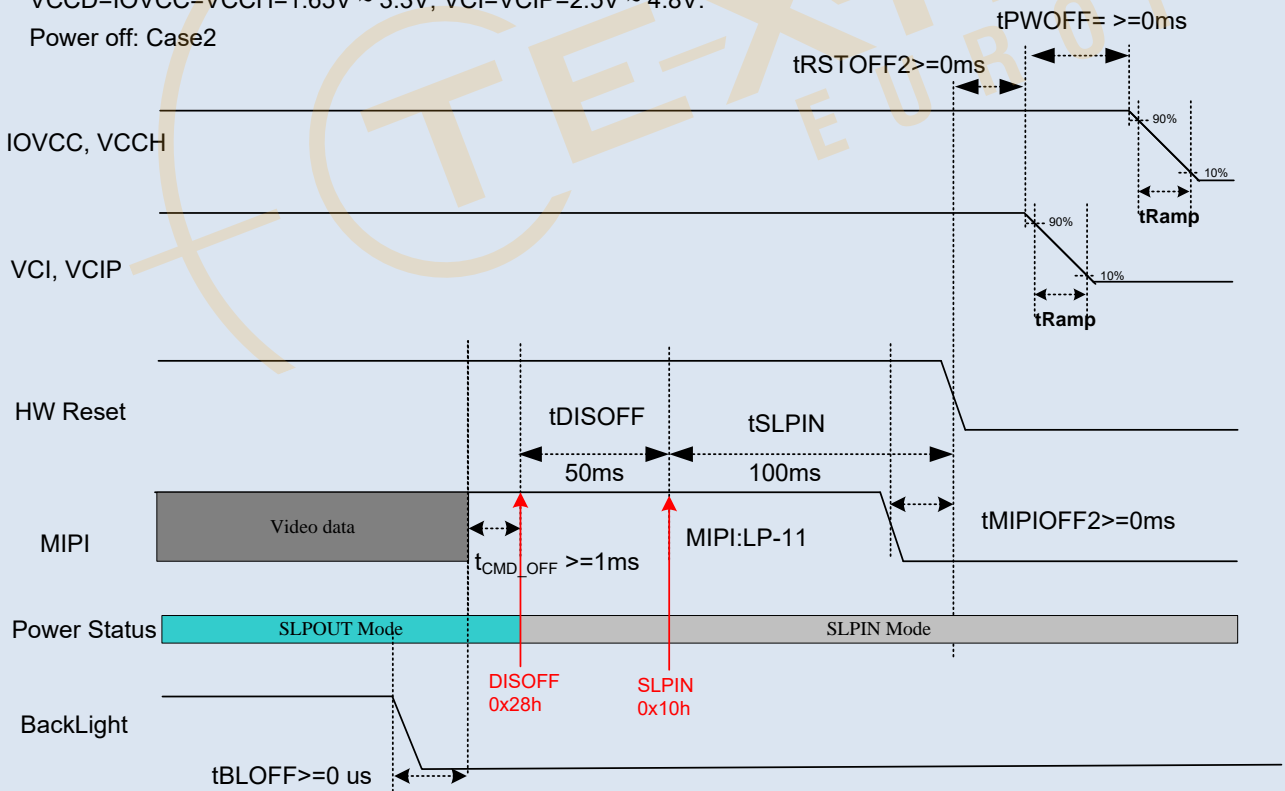
BOOSTM[1:0]=10 (Internal DC/DC power mode : Charge Pump, FP7721)  
 VCCD=IOVCC=VCCH=1.65V ~ 3.3V, VCI=VCIP=2.5V ~ 4.8V.

Power off: Case 1



BOOSTM[1:0]=10 (Internal DC/DC power mode : Charge Pump, FP7721)  
 VCCD=IOVCC=VCCH=1.65V ~ 3.3V, VCI=VCIP=2.5V ~ 4.8V.

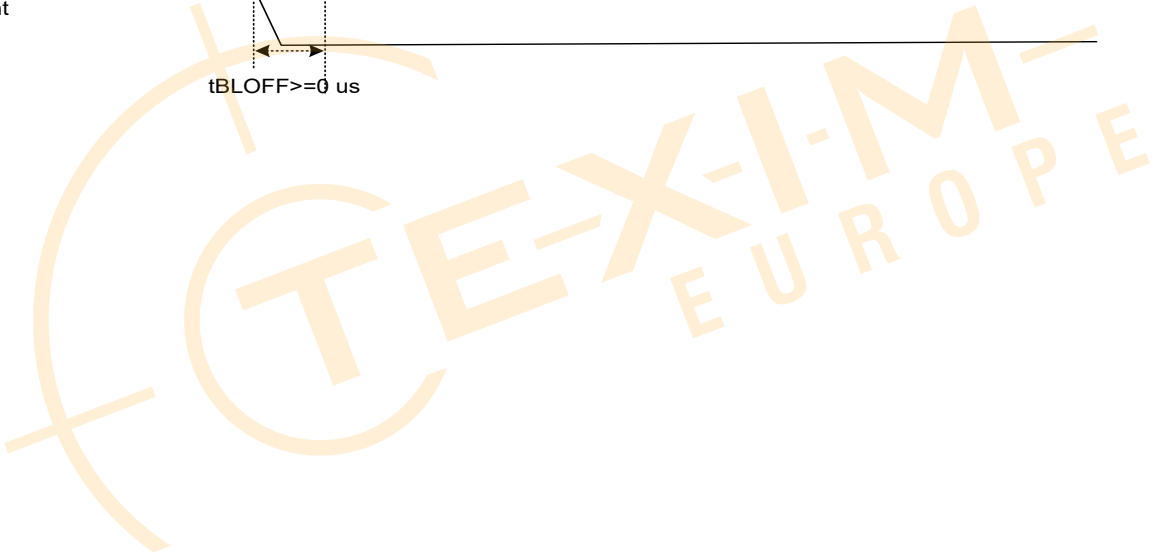
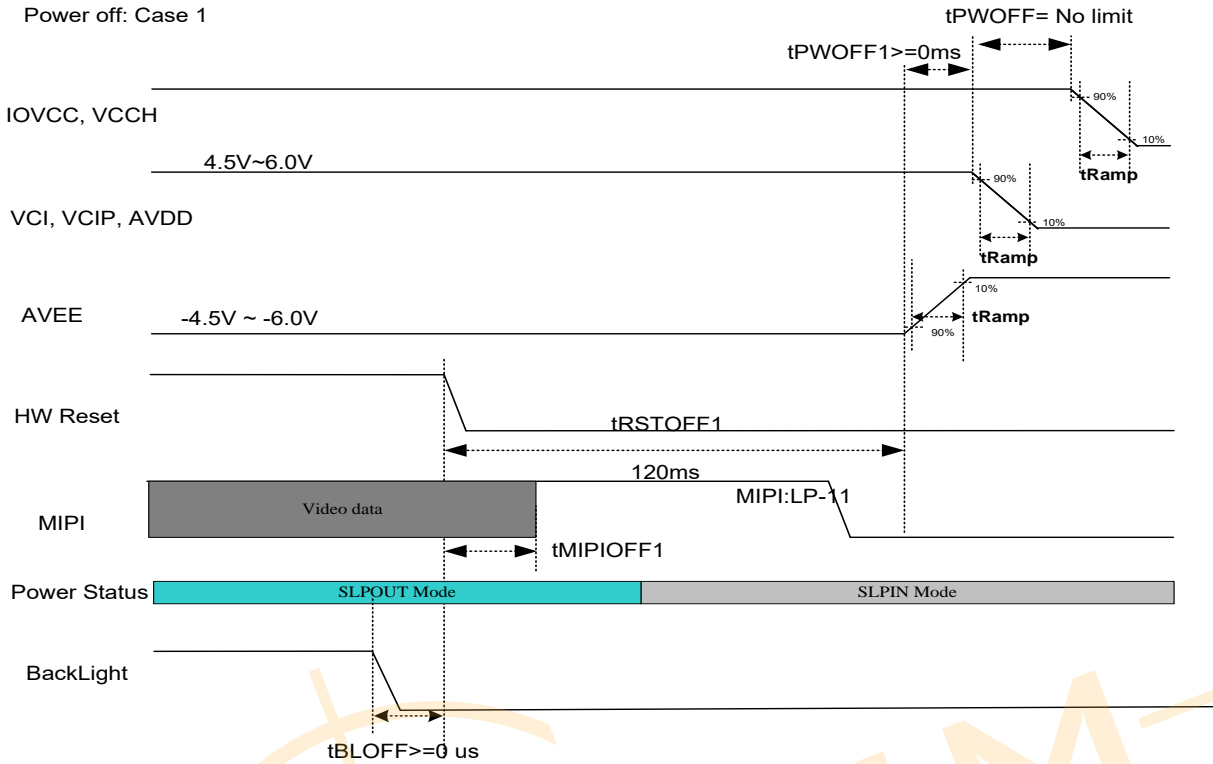
Power off: Case2



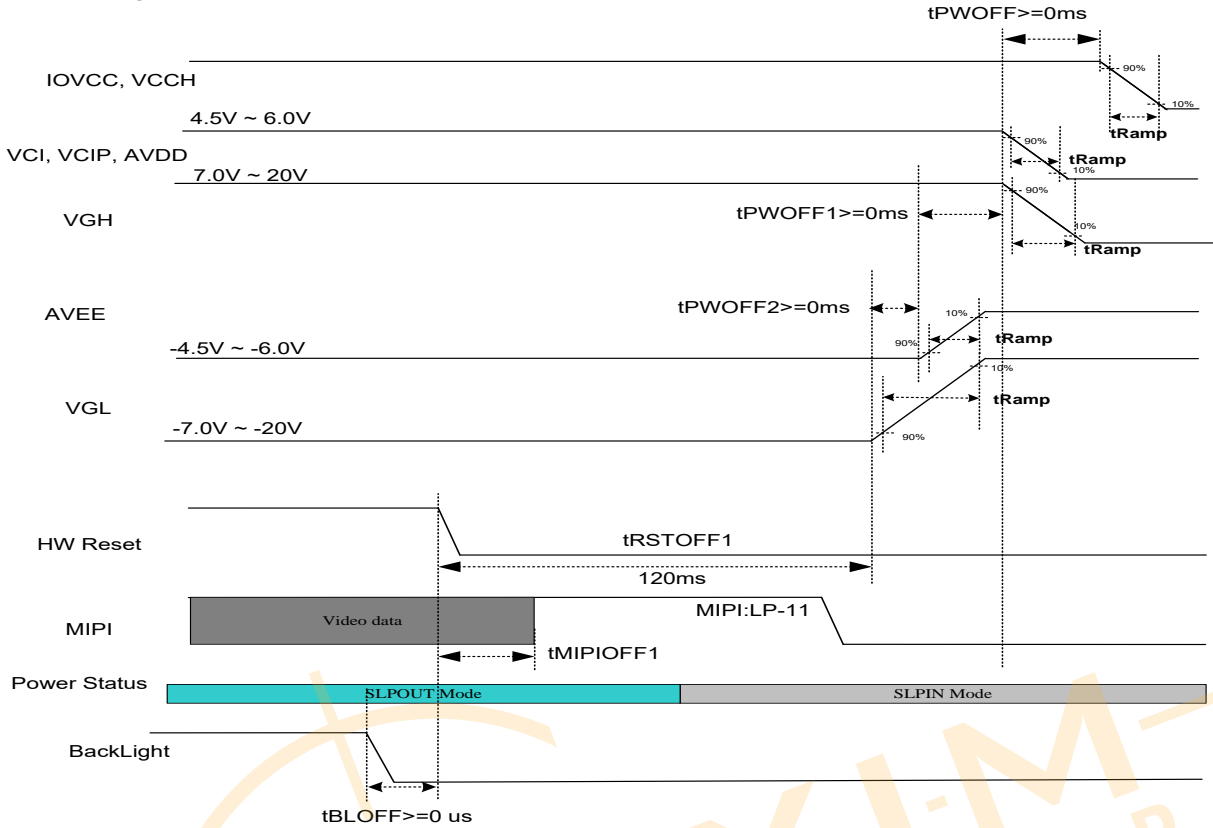
BOOSTM[1:0]=01/11 (External AVDD/AVEE Power)

VCCD=IOVCC=VCCH=1.65V ~ 3.3V, AVDD=VCI=VCIP=4.5V ~ 6.0V, AVEE=-4.5V ~ -6.0V

Power off: Case 1



BOOSTM[1:0]=00 (External AVDD/AVEE/VGH/VGL)  
 IOVCC=VCCH=1.65V ~ 3.3V, VCI=VCIP=AVDD=4.5V ~ 6.0V, AVEE=-4.5V~-6.0V, VGH=7V~20V, VGL=-7V~-15V  
 Power off: Case 1



BOOSTM[1:0]=00 (External AVDD/AVEE/VGH/VGL)  
 IOVCC=VCCH=1.65V ~ 3.3V, VCI=VCIP=AVDD=4.5V ~ 6.0V, AVEE=-4.5V~-6.0V, VGH=7V~20V, VGL=-7V~-15V  
 Power off: Case 2

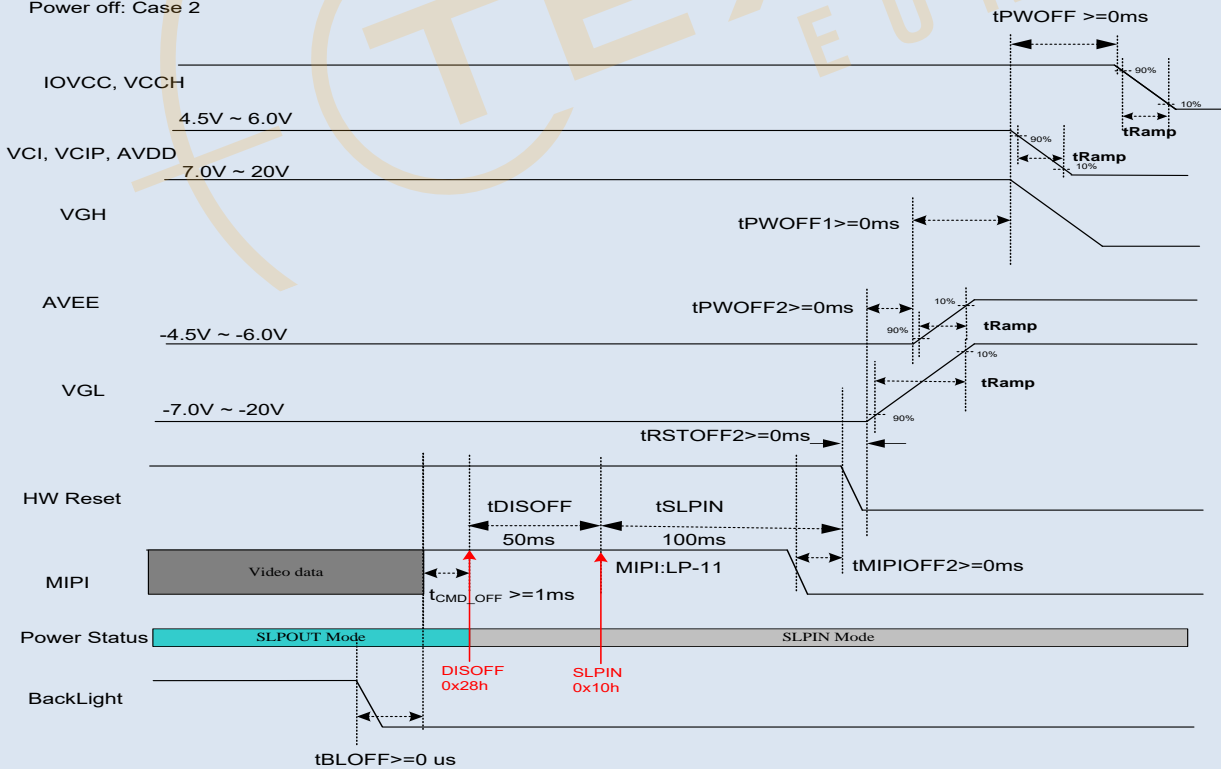
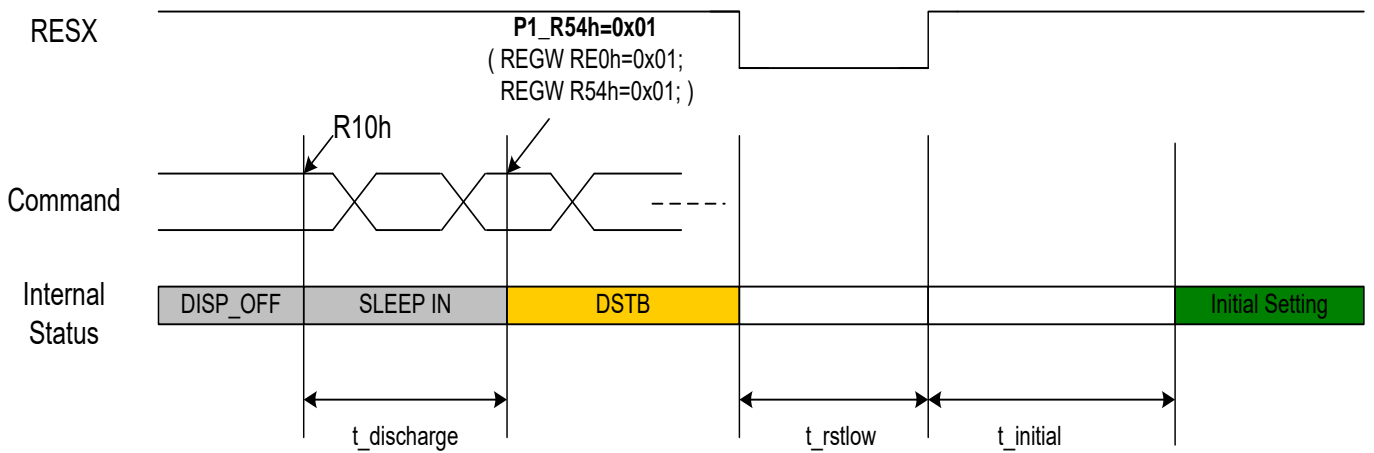


Figure 9.11: Power off sequence for differential power mode

## 7.0. Deep standby Flow

The figure below illustrates deep standby flow, :



| Signal | Symbol                 | Parameter                                | MIN | TYP | MAX | Unit | Description |
|--------|------------------------|--|-----|-----|-----|------|-------------|
| RESX   | $t_{\text{discharge}}$ | Sleep in into DSTB delay time            | 100 | -   | -   | ms   |             |
|        | $t_{\text{rstlow}}$    | Reset low pulse                          | 5   | -   | -   | ms   |             |
|        | $t_{\text{initial}}$   | Reset high to initial setting delay time | 10  | -   | -   | ms   |             |

Note 1)  $t_{\text{discharge}}$  suggested delay time over 100ms.

Note 2)  $t_{\text{initial}}$  suggested delay time over 10ms..

## 8.0 OPTICAL CHARACTERISTICS

### 8.1 Optical Specification (w/HSD FOG+ D65 light)

| Item                                  | Symbol | Condition                                     | Min. | Typ.    | Max. | Unit | Note   |
|---------------------------------------|--------|---|------|---------|------|------|--|
| White Reflectance<br>(with Polarizer) | Rw (%) | $\Theta=0$<br>Normal<br>viewing<br>angle<br>— | —    | (18.88) | —    | %    | (4)<br>Measuring with<br>HSD polarizer ,<br>Reference Only<br>Base on Vop=3.5V |
| Contrast Ratio(CR>2)                  | CR     |   | —    | (15)    | —    | —    | (1)(2) Base on<br>Vop=3.5V   |
| Nature Color Saturation               | S%     |   | —    | (35.57) | —    | %    |  |
| Response Time                         | ms     |   | —    | 5       | 7    |      |  |
| Color<br>Chromaticity<br>(CIE1931)    | White  | W <sub>x</sub>                                | —    | (0.308) | —    |      | (1)(4)<br>Measuring with<br>HSD polarizer ,<br>Reference Only                  |
|                                       |        | W <sub>y</sub>                                | —    | (0.326) | —    |      |  |
|                                       | Red    | R <sub>x</sub>                                | —    | TBD     | —    |      |  |
|                                       |        | R <sub>y</sub>                                | —    | TBD     | —    |      |  |
|                                       | Green  | G <sub>x</sub>                                | —    | TBD     | —    |      |  |
|                                       |        | G <sub>y</sub>                                | —    | TBD     | —    |      |  |
|                                       | Blue   | B <sub>x</sub>                                | —    | TBD     | —    |      |  |
|                                       |        | B <sub>y</sub>                                | —    | TBD     | —    |      |  |
| Viewing Angle                         | Hor.   | $\Theta_L$                                    | —    | 60      | —    | —    | (1)(4)<br>Measuring with<br>HSD polarizer ,<br>Reference Only                  |
|                                       |        | $\Theta_R$                                    | —    | 60      | —    |      |  |
|                                       | Ver.   | $\Theta_U$                                    | —    | 60      | —    |      |  |
|                                       |        | $\Theta_D$                                    | —    | 60      | —    |      |  |

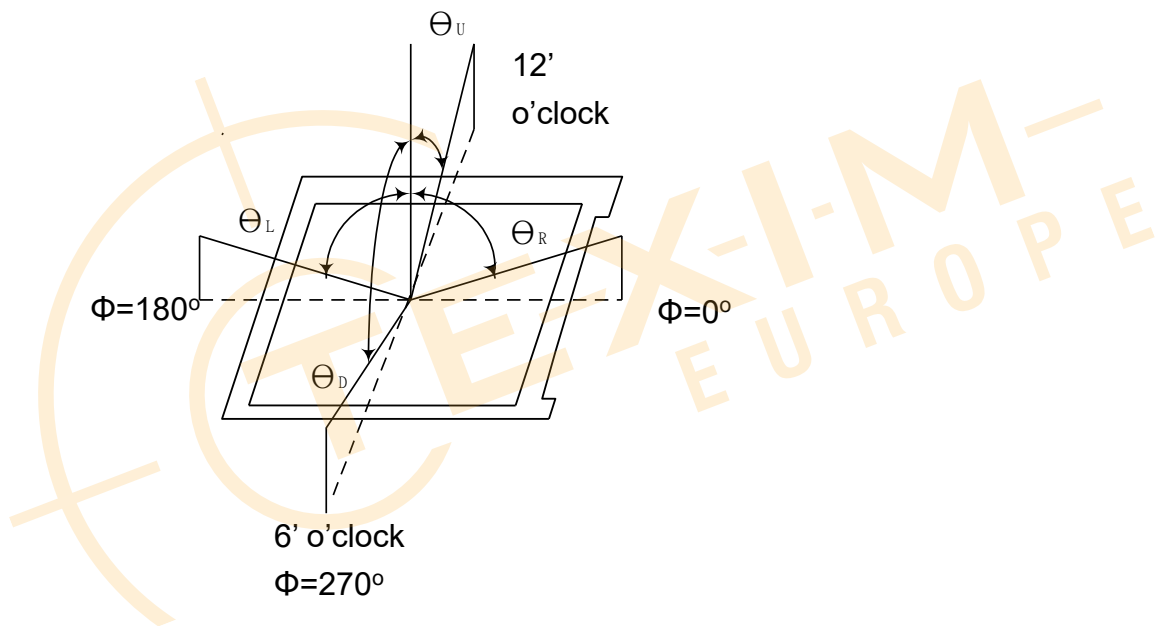
### 8.2 Measuring Condition

- Measuring surrounding : dark room
- Ambient temperature :  $25\pm 2^{\circ}\text{C}$
- 15min. warm-up time.

### 8.3 Measuring Equipment

- FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.

Note (1) Definition of Viewing Angle:



Note (2) Definition of Contrast Ratio (CR) :  
measured at the center point of panel

$$\text{CR} = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$



## 9.0 General Precaution

### 9.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life-threatening or otherwise catastrophic.

### 9.2 Assembly Precaution

- 1、 Please use the mounting hole on the module side in installing and do not bending or wrenching LCD in assembling. And please do not drop, bend or twist LCD module in handling.
- 2、 Please design display housing in accordance with the following guide lines.
- 3、 Housing case must be destined carefully so as not to put stresses on LCD all sides and not to wrench module. The stresses may cause non-uniformity even if there is no non-uniformity statically.
- 4、 Keep sufficient clearance between LCD module back surface and housing when the LCD module is mounted. The clearance in the design is recommended taking into account the tolerance of LCD module thickness and mounting structure height on the housing.
- 5、 Please do not push or scratch LCD panel surface with any-thing hard. And do not soil LCD panel surface by touching with bare hands. (Polarizer film, surface of LCD panel is easy to be flawed.)
- 6、 Please do not press any parts on the rear side such as source IC, gate IC, and FPC during handling LCD module. If pressing rear part is unavoidable, handle the LCD module with care not to damage them.
- 7、 Please wipe out LCD panel surface with absorbent cotton or soft cloth in case of it being soiled.
- 8、 Please wipe out drops of adhesives like saliva and water on LCD panel surface immediately. They might damage to cause panel surface variation and color change. 11.2.7 Please do not take a LCD module to pieces and reconstruct it. Resolving and reconstructing modules may cause them not to work well.

### 9.3 Disassembling or Modification

Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. Leadtek does not warrant the module, if customers disassemble or modify the module.

### 9.4 Breakage of LCD Panel

- 1、 If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid crystal, and do not contact liquid crystal with skin.
- 2、 If liquid crystal contacts mouth or eyes, rinse out with water immediately.
- 3、 If liquid crystal contacts skin or cloths, wash it off immediately with alcohol and rinse thoroughly with water.
- 4、 Handle carefully with chips of glass that may cause injury, when the glass is broken.

## 9.5 Absolute Maximum Ratings and Power Protection Circuit

- 1、 Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature, etc., otherwise LCD module may be damaged.
- 2、 Please do not leave LCD module in the environment of high humidity and high temperature for a long time.
- 3、 It's recommended employing protection circuit for power supply.

### 11.6 Operation

- 1、 Do not touch, push or rub the polarizer with anything harder than HB pencil lead. Use fingerstalls of soft gloves in order to keep clean display quality, when persons handle the LCD module for incoming inspection or assembly.
- 2、 When the surface is dusty, please wipe gently with absorbent cotton or other soft material.
- 3、 Wipe off saliva or water drops as soon as possible. If saliva or water drops contact with polarizer for a long time, they may causes deformation or color fading.
- 4、 When cleaning the adhesives, please use absorbent cotton wetted with a little petroleum benzine or other adequate solvent.

## 9.6 Static Electricity

- 1、 Protection film must remove very slowly from the surface of LCD module to prevent from electrostatic occurrence.
- 2、 Because LCD module uses CMOS-IC on TFT-LCD panel, it is very weak to electrostatic discharge. Please be careful with electrostatic discharge.
- 3、 Persons who handle the module should be grounded through adequate methods.

## 9.7 Disposal

When disposing LCD module, obey the local environmental regulations.

## 9.8 OTHERS

- 1、 A strong incident light into LCD panel might cause display characteristics' changing inferior because of polarizer film, color filter, and other materials becoming inferior. Please do not expose LCD module direct sunlight land strong UV rays.
- 2、 Please pay attention to a panel side of LCD module not to contact with other materials in preserving it alone.
- 3、 For the packaging box, please pay attention to the followings:
- 4、 Packaging box and inner case for LCD are designed to protect the LCDs from the damage or scratching during transportation. Please do not open except picking LCDs up from the box.
- 5、 Please do not pile them up more than 6 boxes. (They are not designed so.) And please do not turn over.
- 6、 Please handle packaging box with care not to give them sudden shock and vibrations. And also please do not throw them up.
- 7、 Packing box and inner case for LCDs are made of cardboard. So please pay attention not to get them wet. (Such like keeping them in high humidity or wet place can occur getting them wet.)

## 10.0 Packing form-TBD



LEADTEK DISPLAY

# 深圳市丽台电子有限公司

Shenzhen Leadtek Electronics Co.,Ltd

## Incoming Inspection Standards

### 来料检验标准

**Model No. / 产品型号:** Applies More than 10.0 Inches Touch Display Screen

**Updated Date /生效日期:** 2022-05-20

**Version / 版本:** A0

**Customer confirmation :** \_\_\_\_\_

Record of Revision /修订履历

| Version /版本 | Revision Record /修订内容 | Reviser /修订人 | Revision Date /修订日期 |
|-------------|-----------------------|--------------|---------------------|
| V0          | 首发 / Starting         | Green        | 2022.05.20          |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |
|             |                       |              |                     |

## 1.Scope of application /适用范围.

This document shall be applied to more than 10.0 inches touch display screen.

本文件适用于5.5~10.0 寸触摸显示屏.

## 2.Inspection conditions and environment /检验条件与环境.

### 2.1 Inspection Conditions /检验条件:

(1) Inspection Distance /检测距离: 35cm ±5cm.

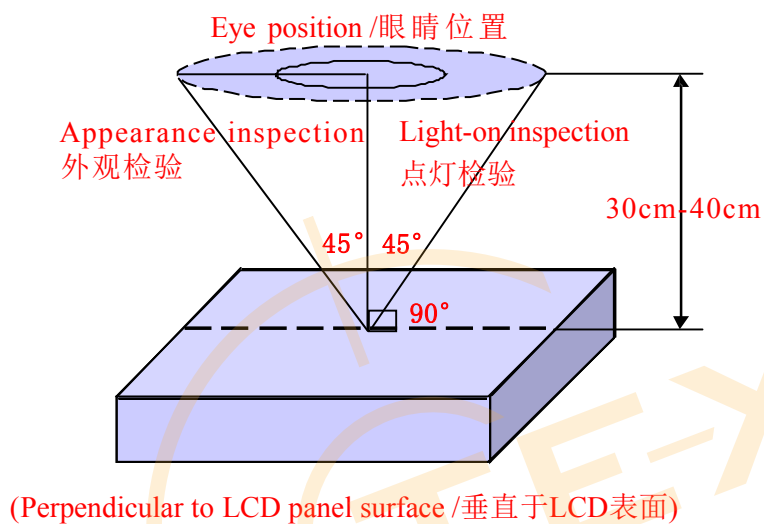
(2) Check time /检验时间:

Displays performance test /功能测试: 3~5S /Image, Cosmetic Inspection /外观检验:12~15S.

(3) Check the viewing angle /检验视角:

Light-on Inspection Angle /点灯检验角度: ±45°.

Cosmetic Inspection Angle /外观检验角度: ±45°.



### 2.2 Inspection environment /检验环境:

|                            |                               |              |
|----------------------------|-------------------------------|--------------|
| Ambient Temperature<br>温度  |                               | 25°C±5°C     |
| Ambient Humidity<br>湿度     |                               | 55±5%RH      |
| Ambient Illumination<br>亮度 | Cosmetic Inspection<br>外观检验   | 800-1000 Lux |
|                            | Functional Inspection<br>点灯检验 | 200~300Lux   |

### 2.3 Sampling Conditions /抽样条件:

(1) Quantity to be inspected /批量: Quantity of shipment lot per model /单次运送单一型号数量.

## (2) Sampling method /抽样方法:

|                     |                    |  |
|---------------------|--------------------|--|
| Sampling Plan /抽样计划 |                    | GB/T 2828.1- 2003                                |
|                     |                    | Normal Inspection , Single Sampling<br>正常检验、单次抽样 |
|                     |                    | General inspection level: II<br>一般检验水平: 二级       |
| AQL                 | Major Defect /主要缺陷 | 0.65   |
|                     | Minor Defect /次要缺陷 | 1.0  |

(3) The classification of Major(MA) and Minor(MI) defects is shown as “3.1 Classification of defects” .  
主缺(MA)及次缺(MI)定义于”3.1缺陷分类”.

## 3.Terms And Definitions /术语和定义

## 3.1 Classification of defects / 缺陷分类 :

## (1) Major defects /主要缺陷:

A major defect is a defect that is likely to result in failure, or to reduce materially the usability of the product for its intended purpose .

可导致产品功能失效或减少产品可用性的缺陷.

## (2) Minor defects /次要缺陷:

It will not cause the product to fail and reduce the defects in the effective use and operation of the product.

不会导致产品功能失效和减少产品的有效使用与操作的缺陷.

## 3.2 Point defects /点状缺陷:

The size of the point defect is defined by the diameter D, and the average diameter of the defect is

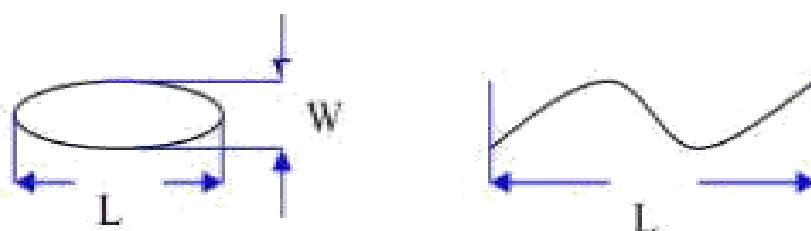
$$D=1/2 (W+L) .$$

点状缺陷的大小是由直径 D 定义的, 缺陷的平均直径  $D=1/2(W+L)$ .

## 3.3 Linear defects /线状缺陷:

When defect size  $L \geq 2W$ , the defect count as liner type defect. Size of linear defect is defined by length ( L ) and the maximum width ( W ).

当缺陷尺寸  $L \geq 2W$  时, 被视为线状缺陷, 线状缺陷是由长度 ( L ) 和最大宽度 ( W ) 定义的.



### 3.4 LCD sub-pixel dot /LCD子像素点

(1) Definition /定义 : The point defect area is greater than 50% of the LCD sub-pixel area, and is visible through ND5% filter masking .

子像素点缺陷面积大于 50% LCD子像素面积, 且透过 ND5%遮盖是可见的.

(2) The drawing of 1/2 area sub-pixel definition / 1/2 面积的子像素定义绘图:

The 1/2 area sub-pixel can be defined as below one or more of specific shapes

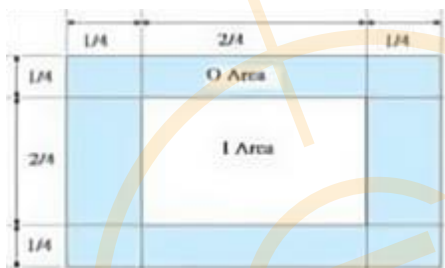
1/2 面积的子像素可以定义为如下一个或多个特定形状图:



### 3.5 Small bright dot /细碎亮点 :

Point defects smaller than "LCD sub-pixels" /小于“LCD子像素点”的点缺陷.

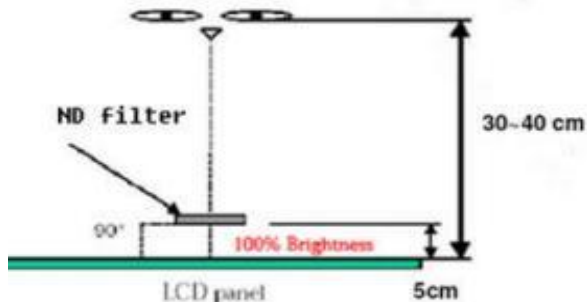
(Ratio of Zone I to Zone O / I 区与 O 区比例: 1: 2: 1)



### 3.6 ND filter inspection method /ND卡的检验方法:

Hold the ND filter about 5cm above the display area, with your eyes 30-40cm away from the panel, and observe for 2~3 seconds.

在显示区域上方大约 5cm 处握住 ND 卡, 眼睛距离面板 30-40cm, 观察2~3 秒.



3.7 Any FPC surface problems that do not leak copper on the surface and do not cause functional failure are acceptable.

任何 FPC 表面问题, 表面未露铜和不造成功能失效是可以接受.

3.8 Extraneous substances that can be wiped out , like Finger point,Particles are not considered as a defect .

可以被擦拭干净的表面物质不视为缺陷 (如手指印, 尘粒) .

3.9 Defects that can be covered by the material and are not visible in appearance are not considered defects.

能被物料覆盖，外观不可见的缺陷不视为缺陷。

3.10 Panel damage /面板损伤:

Glass damage outside the AA display area that does not affect the effective wiring is acceptable.

AA 显示区域以外的玻璃损伤，不影响有效线路是可以接受的。

3.11 Issues not specified or defined in this acceptance standard shall be handled through friendly negotiation between the two parties.

本允收标准中未规定或定义的问题，双方友好协商处理。

## 4. Inspection standards /检验标准

### 4.1 Structural Dimensions /结构尺寸规格

| Serial Number<br>序号 | Measurement items /测量项目               |          | Specification /规格 | Remark /备注   |
|---------------------|---------------------------------------|----------|-------------------|--|
|                     | 名称 /Name                              | Unit /单位 | Tolerance /公差     |  |
| 1                   | Outside dimension: Length<br>尺寸: 长    | mm /毫米   | 0.15mm~0.30mm     | Please refer to the product specification for detailed dimensions and tolerances<br>详细的尺寸规格和公差请参考产品规格书 |
| 2                   | Outside dimension: Width<br>尺寸: 宽     | mm /毫米   | 0.15mm~0.30mm     |  |
| 3                   | Outside dimension: Thickness<br>尺寸: 高 | mm /毫米   | 0.30mm~0.50mm     |  |

### 4.2 Appearance Inspection Specification /外观检验规格

(D : diameter, W : width, L : length, N : quantity, DS : spacing)

| Inspection area<br>检验区域 | Inspection items<br>检验项目          | Inspection specifications<br>检验规格                              | Defect category<br>缺陷类别 |    |
|-------------------------|-----------------------------------|--|-------------------------|----|
| Glass<br>玻璃             | Wire(on Array)<br>线路              | Can't be damaged<br>不能损伤                                       | MA                      |    |
|                         | Chipping/corner breaking<br>崩边/破角 | Can't affect the effective lines and functions<br>不能影响有效线路和功能  | MA                      |    |
|                         | Edge<br>边缘                        | There must be no extensional cracks<br>不可有延伸性裂纹                | MA                      |    |
| Silicone<br>硅胶          | Silicone coating<br>硅胶涂布          | The height must not exceed the LCD CF surface<br>高度不能超过LCD CF面 |                         | MI |
|                         | Glue overflow<br>溢胶               | Can't cover FPC, POL, etc<br>不能覆盖到FPC、POL等                     |                         | MI |

| Inspection area<br>检验区域                 | Inspection items<br>检验项目                                   | Inspection specifications<br>检验规格  | Defect category<br>缺陷类别 |    |
|---|--|--|-------------------------|----|
| PCBA<br><br>FPC<br><br>Connector<br>连接器 | Appearance<br>外观   | Scratches or injuries are not allowed to cause copper exposure<br>划伤或损伤不允许表面出现露铜   |                         | MI |
|   | Component<br>元器件   | Can't be damaged and lack<br>不能损伤和缺少   | MA                      |    |
|   | Goldfinger oxidation<br>金手指氧化                              | Not allowed<br>不允许   |                         | MI |
|   | Connection status<br>连接状况                                  | The connection must be accurate and stable<br>必须准确稳定连接   | MA                      |    |
|   | Break<br>破裂  | Not allowed<br>不允许   | MA                      |    |
|   | Soldering, : false soldering/tinning/tin beads<br>假焊/连锡/锡珠 | Not allowed<br>不允许   | MA                      |    |
| POL<br>偏光片                              | Scratches<br>划伤  | 1. $W \leq 0.10\text{mm}$ ; $L \leq 5\text{mm}$ , Ignore (忽略)<br>2. $0.10\text{mm} < W \leq 0.15\text{mm}$ ; $L \leq 5\text{mm}$ ; $N \leq 5$ ; $DS \geq 10\text{mm}$<br>3. $0.15\text{mm} < W$ ; $5\text{mm} < L$ , Not allowable (不允许) |                         | MI |
|   | Dent<br>凹凸印  | 1. $D \leq 0.25\text{mm}$ , Ignore (忽略)<br>2. $0.25\text{mm} < D \leq 0.50\text{mm}$ ; $N \leq 5$ ; $DS \geq 10\text{mm}$<br>3. $0.50\text{mm} < D$ , Not allowable (不允许)  |                         | MI |
|   | Bubbles<br>气泡  | 1. $D \leq 0.25\text{mm}$ , Ignore (忽略)<br>2. $0.25\text{mm} < D \leq 0.50\text{mm}$ ; $N \leq 5$ ; $DS \geq 10\text{mm}$<br>3. $0.50\text{mm} < D$ , Not allowable (不允许)  |                         | MI |
|   | Point defects<br>点状不良                                      | 1. $D \leq 0.25\text{mm}$ , Ignore (忽略)<br>2. $0.25\text{mm} < D \leq 0.50\text{mm}$ ; $N \leq 5$ ; $DS \geq 10\text{mm}$<br>3. $0.50\text{mm} < D$ , Not allowable (不允许)  |                         | MI |
|   | Edge bubbles<br>边缘气泡                                       | 1. Within 1/2BM of the display area, it is not allowed<br>显示区往外 1/2BM 区域内, 不允许<br>2. The display area is 1/2 outside the BM area, and it is not controlled<br>显示区往外 1/2BM 区域以外, 不管控  |                         | MI |
|   | Dirty/watermarked<br>脏污/水印                                 | No dirt/water lines/finger marks are allowed, and must be wiped clean<br>不允许有脏污/水印/手指印, 须擦拭干净方可  |                         | MI |
|   | Warping<br>起翘  | Not allowed<br>不允许   |                         | MI |
|   | Attaching offset<br>贴偏                                     | It is necessary to completely cover the display area outward, within the 1/2BM area, or without leaking POL edges after TP is attached<br>需完整覆盖显示区往外、1/2BM 区以内或贴合 TP 后不会出现漏偏光片边缘   |                         | MI |
|   | Mixture<br>混料  | Mixing different types of POL or not using POL as required by the BOM, not allowed<br>不允许混贴不同型号的 POL 或未按 BOM 要求使用 POL  | MA                      |    |



| Inspection area<br>检验区域 | Inspection items<br>检验项目   | Inspection specifications<br>检验规格   | Defect category<br>缺陷类别 |    |
|-------------------------|--|---|-------------------------|----|
| TP&CG                   | Point defects<br>点状不良  | 1. $D \leq 0.25\text{mm}$ , Ignore (忽略)<br>2. $0.25\text{mm} < D \leq 0.50\text{mm}$ ; $N \leq 5$ ; $DS \geq 10\text{mm}$<br>3. $0.50\text{mm} < D$ , Not allowable (不允许)   |                         | MI |
|                         | Scratches<br>划伤  | 1. $W \leq 0.10\text{mm}$ ; $L \leq 5\text{mm}$ , Ignore (忽略)<br>2. $0.10\text{mm} < W \leq 0.15\text{mm}$ ; $L \leq 5\text{mm}$ ; $N \leq 5$ ; $DS \geq 10\text{mm}$<br>3. $0.15\text{mm} < W$ ; $5\text{mm} < L$ , Not allowable (不允许)<br>4. There is a feeling scratch, Not allowable (有感知划伤, 不允许) |                         | MI |
|                         | Edges and corners cracked<br>崩角/崩边   | 1. Product front / 产品正面: Edge and corner chipping is not allowed 崩角、崩边不允许<br>2. Product back / 产品背面:<br>$X \leq 0.5$ , $Y \leq 0.5$ , $Z \leq 1/2T$ ; $N \leq 5$ ; $DS \geq 10\text{mm}$  |                         | MI |
|                         | Silk screen<br>丝印  | The silk screen is clear, complete and correct<br>丝印清晰、完整、内容正确  |                         | MI |
|                         | Dirty<br>脏污  | Non-wipeable dirt, not allowed<br>不可擦拭的脏污, 不允许  |                         | MI |
|                         | Broken<br>破损   | Not allowable<br>不允许  | MA                      |    |
|                         | Ink color aberration<br>油墨色差   | $\Delta E > 1$ , Not allowable (不允许)  |                         | MI |
|                         | Cover pinholes<br>针孔   | 1. $D \leq 0.20\text{mm}$ , $N \leq 5$ , $DS \geq 10\text{mm}$ , allowable<br>2. $D > 0.20\text{mm}$ , intensive pinholes (密集型针孔), Not allowable (不允许)  |                         | MI |
|                         | IR holes<br>IR孔  | Dirt, deviation, color difference, etc. are not allowed<br>不允许脏污、偏位、色差等   |                         | MI |
| BL<br>背光                | Backlight separation<br>背光分离   | Not allowable<br>不允许  |                         | MI |
|                         | Deformation of rubber iron and rubber frame<br>胶铁、胶框变形   | Use the plug gauge 0.3mm on the flat surface and can snap in and judge NG<br>在平面上使用塞规0.3mm卡翘曲位置, 能卡进判定NG  |                         | MI |
|                         | The iron frame is oxidized and not tightened<br>铁框氧化、卡不紧   | Not allowable<br>不允许  |                         | MI |
|                         | Backlight sticky solder beads, glue, etc<br>背面粘锡珠、残胶等  | Not allowable<br>不允许  |                         | MI |
|                         | Inkjet coding, Barcode, QR code<br>喷码/条码/二维码   | The Inkjet coding is clear and complete, the barcode and QR code can be scanned normally, and the content and format match<br>喷码清晰完整、条码和二维码可正常扫描, 内容和格式相符   |                         | MI |
|                         | Accessories (protective film, double-sided tape, insulating adhesive, etc.)<br>辅料 (保护膜、双面胶、绝缘胶等) | Defects such as missing pastes, sticking deviations, defects, and fractures are not allowed<br>不允许有漏贴、贴偏、残缺、断裂等缺陷   |                         | MI |

## 4.3 Electrical test specifications /电性检查规格

( D : diameter, W : width, L : length, N : quantity, DS : spacing )

| Inspection items<br>检验项目                          | Inspection specifications<br>检验规格  | Defect category<br>缺陷类别 |    |
|---|--|-------------------------|----|
| Glass bright spots/dark spots<br>玻璃亮点/暗点          | 1. $D \leq 0.25\text{mm}$ , Ignore (忽略)<br>2. $0.25\text{mm} < D \leq 0.50\text{mm}$ ; $N \leq 5$ ; $DS \geq 10\text{mm}$<br>3. $0.50\text{mm} < D$ , Not allowable (不允许)  |                         | MI |
| Mura  | Use ND5% filter masking, visual invisibility is OK, 200~300Lux<br>使用ND5%遮盖, 目视不可见即为OK, 200~300Lux  |                         | MI |
| Small bright dot<br>细碎亮点                          | Use ND5% filter masking, visual invisibility is OK<br>使用ND5%遮盖, 目视不可见即为OK  |                         | MI |
| Light leakage<br>漏光                               | 1. Use ND5% filter masking, visual invisibility is OK<br>使用ND5%遮盖, 目视不可见即为OK<br>2. If necessary, sign off on the sample<br>必要时, 签限定样   |                         | MI |
| Backlight black/white dots<br>背光黑点/白点             | 1. $D \leq 0.25\text{mm}$ , Ignore (忽略)<br>2. $0.25\text{mm} < D \leq 0.50\text{mm}$ ; $N \leq 5$ ; $DS \geq 10\text{mm}$<br>3. $0.50\text{mm} < D$ , Not allowable (不允许)  |                         | MI |
| Linear foreign bodies<br>线状异物 (异物毛丝等)             | 1. $W \leq 0.10\text{mm}$ ; $L \leq 5\text{mm}$ , Ignore (忽略)<br>2. $0.10\text{mm} < W \leq 0.15\text{mm}$ ; $L \leq 5\text{mm}$ ; $N \leq 5$ ; $DS \geq 10\text{mm}$<br>3. $0.15\text{mm} < W$ ; $5\text{mm} < L$ , Not allowable (不允许) |                         | MI |
| Black/White Print<br>黑印/白印                        | Use ND5% filter masking, visual invisibility is OK<br>使用ND5%遮盖, 目视不可见即为OK  |                         | MI |
| The display is uneven<br>显示不均匀                    | Use ND5% filter masking, visual invisibility is OK<br>使用ND5%遮盖, 目视不可见即为OK  |                         | MI |
| The brightness is uneven<br>亮度不均匀                 | Brightness uniformity $< 85.0\%$ , Not allowable<br>亮度均匀性 $< 85.0\%$ , 不允许   |                         | MI |
| Displacement of the membrane<br>膜材移位              | Not allowable<br>不允许   |                         | MI |
| Interference pattern/Newtonian pattern<br>干涉纹/牛顿纹 | Not allowable<br>不允许   |                         | MI |
| Display abnormal<br>显示异常                          | Not allowable<br>不允许   | MA                      |    |
| No display<br>无显示                                 | Not allowable<br>不允许   | MA                      |    |
| Line/Missing Drawing<br>线条/缺画                     | Not allowable<br>不允许   | MA                      |    |
| Splash screen<br>闪屏                               | Not allowable<br>不允许   | MA                      |    |
| LCD grid<br>LCD网格                                 | Not allowable<br>不允许   | MA                      |    |
| Afterimage<br>残影                                  | Not allowable<br>不允许   | MA                      |    |
| Wrong viewing angle<br>视角错误                       | Not allowable<br>不允许   | MA                      |    |
| No touch<br>无触摸                                   | Not allowable<br>不允许   | MA                      |    |
| Touch the jump point<br>触摸跳点                      | Not allowable<br>不允许   | MA                      |    |
| Not sensitive<br>触摸不灵敏                            | Not allowable<br>不允许   | MA                      |    |

## **Disclaimer**

ALL PRODUCTS, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Texim Europe B.V. its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Texim"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Texim makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product.

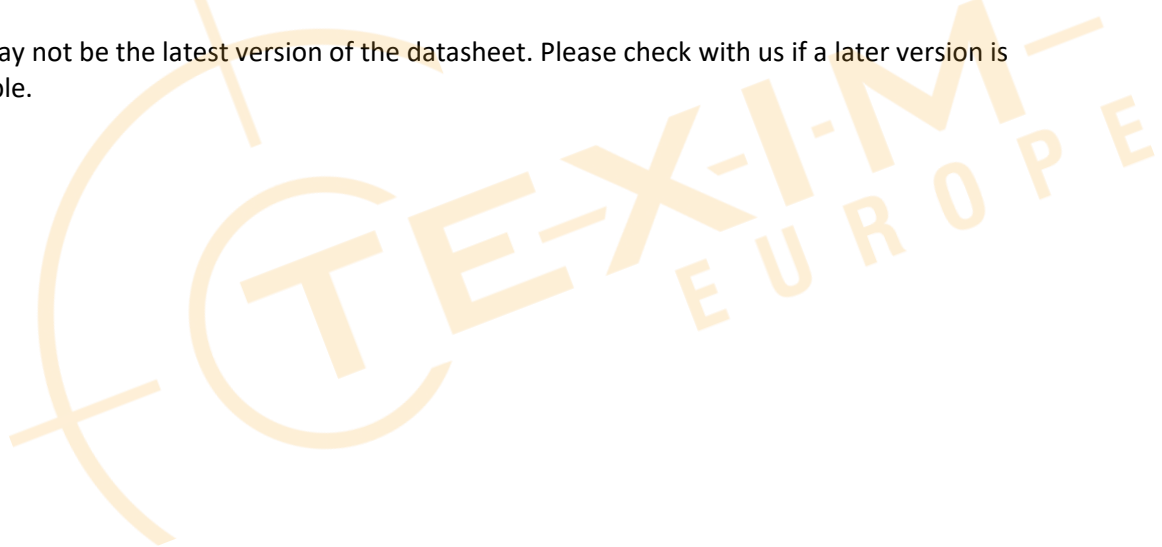
It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application.

Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time.

All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts.

Please contact us if you have any questions about the contents of the datasheet.

This may not be the latest version of the datasheet. Please check with us if a later version is available.





## Headquarters & Warehouse

Elektrostraat 17  
 NL-7483 PG Haaksbergen  
 The Netherlands

T: +31 (0)53 573 33 33  
 E: info@texim-europe.com  
 Homepage: www.texim-europe.com



### The Netherlands

Elektrostraat 17  
 NL-7483 PG Haaksbergen

T: +31 (0)53 573 33 33  
 E: nl@texim-europe.com



### Belgium

Zuiderlaan 14, box 10  
 B-1731 Zellik

T: +32 (0)2 462 01 00  
 E: belgium@texim-europe.com



### UK & Ireland

St Mary's House, Church Lane  
 Carlton Le Moorland  
 Lincoln LN5 9HS

T: +44 (0)1522 789 555  
 E: uk@texim-europe.com



### Germany - North

Bahnhofstrasse 92  
 D-25451 Quickborn

T: +49 (0)4106 627 07-0  
 E: germany@texim-europe.com



### Germany - South

Martin-Kollar-Strasse 9  
 D-81829 München

T: +49 (0)89 436 086-0  
 E: muenchen@texim-europe.com



### Austria

Warwitzstrasse 9  
 A-5020 Salzburg

T: +43 (0)662 216 026  
 E: austria@texim-europe.com



### Nordic

Stockholmsgade 45  
 2100 Copenhagen

T: +45 88 20 26 30  
 E: nordic@texim-europe.com



### Italy

Martin-Kollar-Strasse 9  
 D-81829 München

T: +49 (0)89 436 086-0  
 E: italy@texim-europe.com