

# Shenzhen Leadtek Electronics Co.,Ltd

## PRODUCT SPECIFICATION

### TFT-LCD MODULE

**Module No:** LTK043FTBLM41-V0

Preliminary Specification

Approval Specification

Designed by	Checked by	Approved by
<i>jona</i>	<i>Jams</i>	<i>lan</i>

### Final Approval by Customer

Approved by	Comment

※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.



## 2.General Specifications

NO	Item	Specification	Unit	Remark
1	LCD Size	TFT"4.3	inch	-
2	Panel Type	IPS	-	-
3	Resolution	480 x RGB x800	pixel	-
4	Display Mode	Normally Black	-	-
5	Number of Colors	16.7M	-	-
6	Viewing Direction	ALL FULL	-	-
7	Module Size	60.00 (H) x101.80(V) x1.70(T)	mm	Note
8	Panel Active Area	56.16 (H) x 93.60 (V)	mm	Note
9	Pixel Pitch	0.117x0.117	mm	-
10	Weight	23.8	g	-
11	Driver IC	-	-	-
12	Light Source	white LED in 2S5P	-	-
13	Interface	MIPI-2 Lane	-	-

Note : Please refer to the mechanical drawing ;

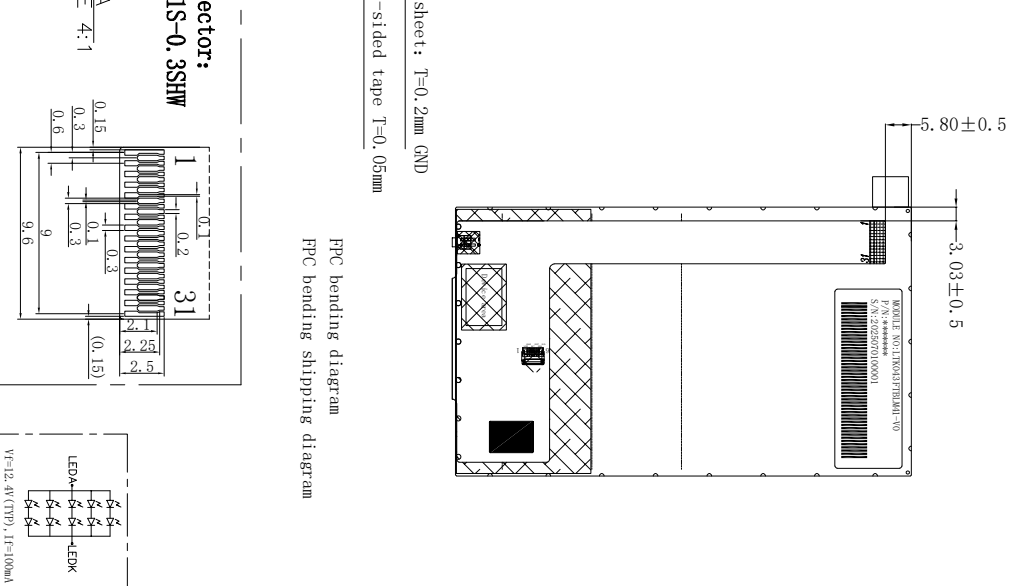
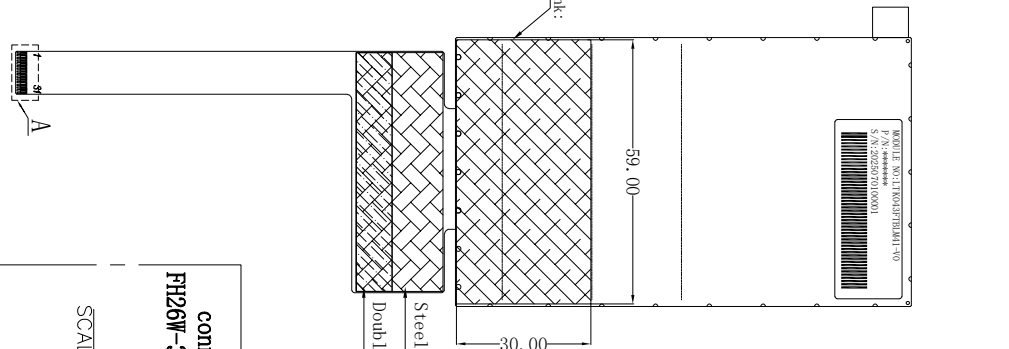
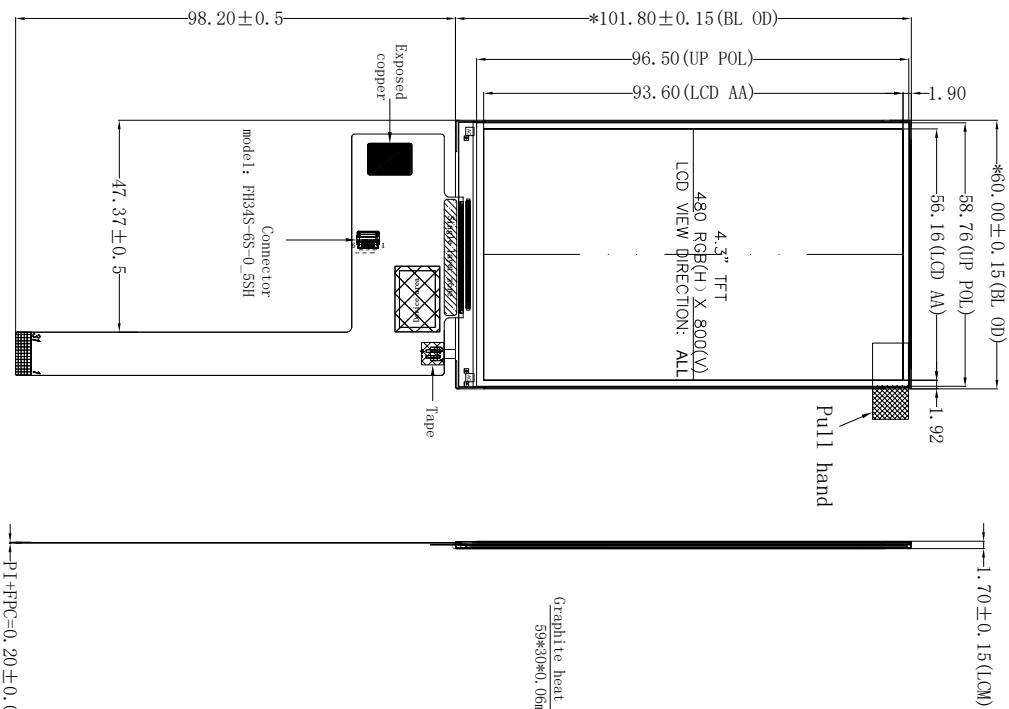
## 3.EXTERNAL DIMENSIONS

# Front View

# Side View

# Back View

# Back View



Display Pin Interface

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

### Notes:

1. Display : 4.3", TFT
2. Resolution: 480XRGBX800
3. LCD Viewing Direction: all
4. Display Mode: Normally Black
5. LCM Brightness: 1000cd/m² (TYP)
6. Unmarked tolerance: ±0.2
7. Operating temperature: -20° C~+70° C
8. Storage temperature: -30° C~+80° C
9. Requirements on Environmental Protection: ROHS

### Barcode Requirements:

MODULE NO: LTK043FTBLM41-V0  
 P/N: \*\*\*\*\*  
 S/N: 2025070100001  
 \*\*\*\*\*  
 \*\*\*\*\*

Product model: unchanged  
 Customer code: unchanged  
 The production date is July 1, 2025, and 0000 is the product serial number.

**LEADTEK DISPLAY**

Shenzhen Leadtek Electronics Co., Ltd

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

Part No: LTK043FTBLM41 VER: V0

Cus tomer No: Approve

Jams

Check

Drawn

3					
2					
1					
0		NEW	2025.08.14	kevin	
REV	DESCRIPTION	DATE	NAME		

## 4.0 Interface pin define

### LCM Interface PIN Define:

Pin No.	Symbol	Description	Remark
1	GND	Power Ground	
2	TOUCH_3V3	Touch Panel Power supply	
3	GND	Power Ground	
4	TOUCH_INT	No connect	
5	TOUCH_RST	No connect	
6	TOUCH_SDA	No connect	
7	TOUCH_SCL	No connect	
8	GND	Power Ground	
9	LEDK	Power for LED backlight (Cathode)	
10	LEDA	Power for LED backlight (Anode)	
11	ID	ID PIN Pull High, If not use, please not connect	
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	NC	No connect	
18	NC	No connect	
19	GND	Power Ground	
20	NC	No connect	
21	NC	No connect	
22	GND	Power Ground	
23	CLKP	MIPI-CLKP are differential small amplitude signals	
24	CLKN	MIPI-CLKN are differential small amplitude signals	
25	GND	Power Ground	
26	D1P	MIPI-D1P are differential small amplitude signals	
27	D1N	MIPI-D1N are 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	

## 5.ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit	Note
Power Supply voltage 1	VCI~GND	-0.3	+4.6	V	
Power Supply voltage 2	IOVCC~GND	-0.3	+4.6	V	
Logic Input Voltage Range	$V_{IN}$	-0.3	IOVCC+0.5	V	
Logic Output Voltage Range	$V_O$	-0.3	IOVCC+0.5	V	
Operating temperature	Topr	-20	+70	°C	
Storage temperature	Tstg	-30	+80	°C	

\* The absolute maximum rating values of this product are not allowed to be exceeded at any times. Should a module be used with any of the absolute maximum ratings exceeded, the characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

## 6.DC ELECTRICAL CHARACTERISTICS

### 6.1 Driving TFT LCD Panel

AGND = GND = 0V, Ta = 25°C

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage for analog circuit	VCI	2.5	3.3	3.6	V
Supply voltage for logic circuit	IOVCC	1.65	1.8	3.3	V
Input voltage 'H'level	$V_{IH}$	0.7*IOVCC	—	IOVCC	V
Input voltage 'L'level	$V_{IL}$	GND	—	0.3*IOVCC	V
Output voltage 'H'level	$V_{OH}$	0.8*IOVCC	—	IOVCC	V
Output voltage 'L'level	$V_{OL}$	GND	—	0.2*IOVCC	V

## 6.2 Backlight Characteristics

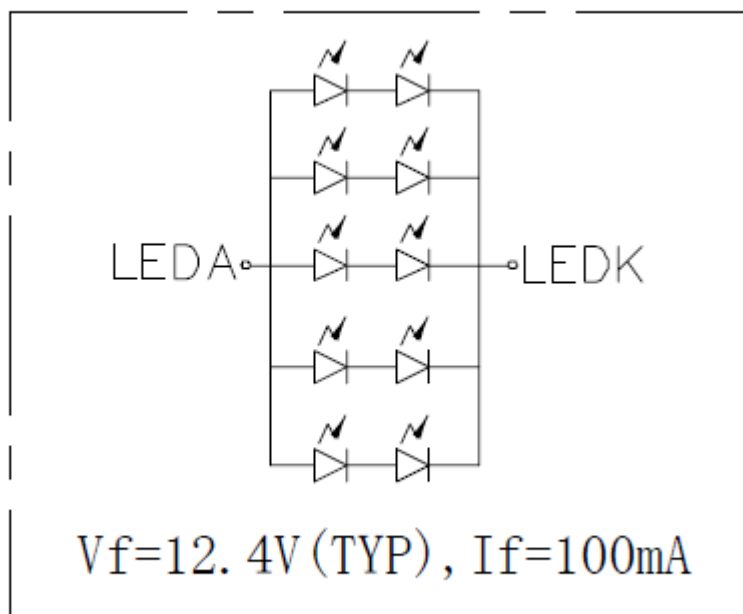
 $T_a = 25^{\circ}\text{C}$ 

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
LED Current	IF	–	100	–	mA	–	–
LED Voltage	VF	–	12.4	–	V	I=100mA	–
Life Time		–	30000	–	Hr.	$I \leq 100\text{mA}$	–
LCM Brightness	Luminance	–	1000	--	cd/m <sup>2</sup>	I=100mA	–
Color	White						

Note (1) Permanent damage may occur to the LCD module if beyond this specification. Functional operation should be restricted to the conditions described under normal operating conditions.

(2)  $T_a = 25 \pm 2^{\circ}\text{C}$

(3) Test condition: LED Current 100mA



## 7.0 MIPI Interface Characteristics:

### 7.1 High Speed Mode

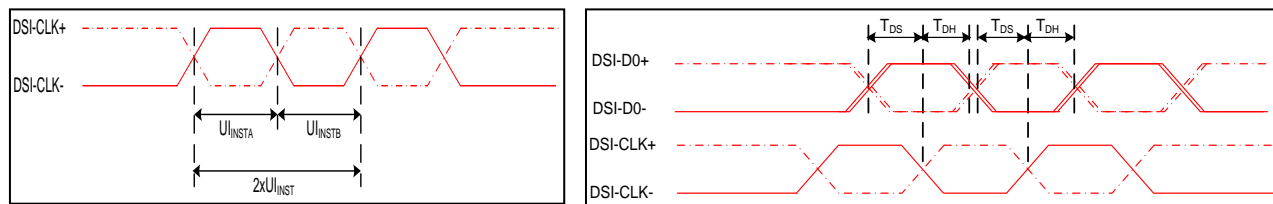


Figure DSI clock channel timing

Figure Rising and falling time on clock and data channel

$V_{DDI}=1.8, V_{DD}=2.8, AGND=DGND=0V, T_a=25\text{ }^{\circ}\text{C}$

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
DSI-CLK+/-	$2xUI_{INSTA}$	Double UI instantaneous	2.5	25	ns	
DSI-CLK+/-	$UI_{INSTA}$ $UI_{INSTB}$	UI instantaneous halves	1.25	12.5	ns	$UI = UI_{INSTA} = UI_{INSTB}$
DSI-Dn+/-	$t_{DS}$	Data to clock setup time	0.15	-	UI	
DSI-Dn+/-	$t_{DH}$	Data to clock hold time	0.15	-	UI	

Table Mipi Interface- High Speed Mode Timing Characteristics

## 7.2 Low Power Mode

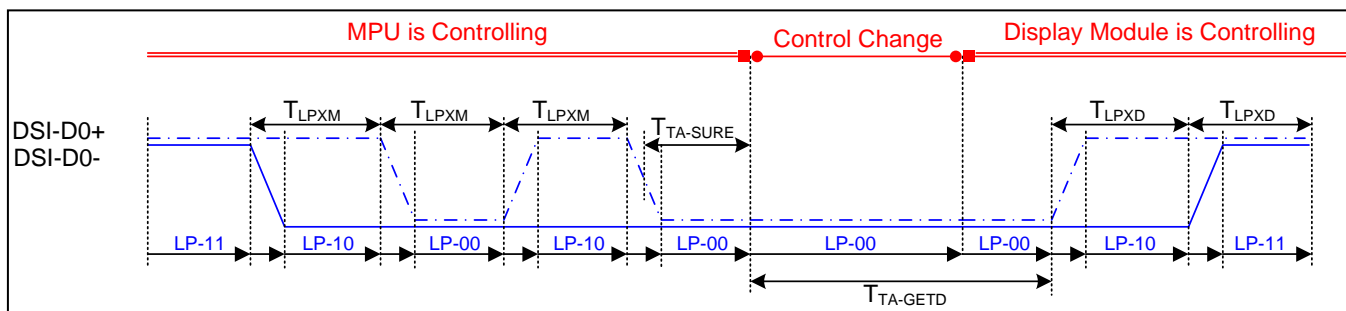


Figure Bus Turnaround (BTA) from display module to MPU Timing

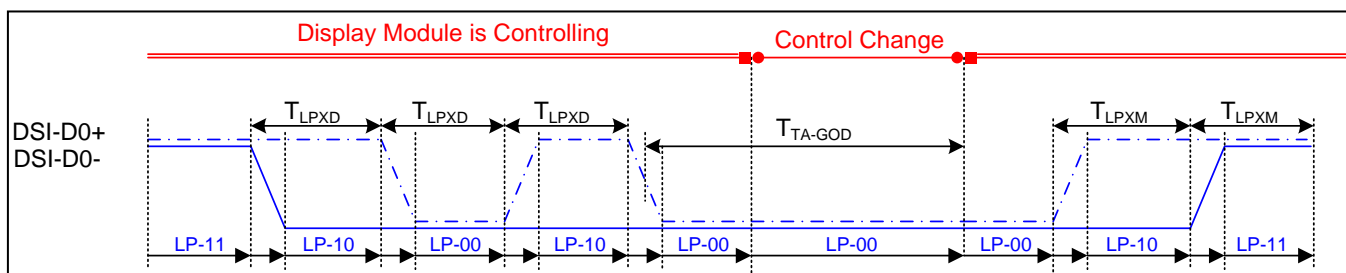


Figure Bus Turnaround (BTA) from MPU to display module Timing

VDDI=1.8, VDD=2.8, AGND=DGND=0V, Ta=25 °C

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
DSI-D0+/-	TLPXM	Length of LP-00,LP-01, LP-10 or LP-11 periods MPU→Display Module	50	75	ns	Input
DSI-D0+/-	TLPXD	Length of LP-00,LP-01, LP-10 or LP-11 periods MPU→Display Module	50	75	ns	Output
DSI-D0+/-	TTA-SURED	Time-out before the MPU start driving	$T_{LPXD}$	$2 \times T_{LPXD}$	ns	Output
DSI-D0+/-	TTA-GETD	Time to drive LP-00 by display module	$5 \times T_{LPXD}$		ns	Input
DSI-D0+/-	TTA-GOD	Time to drive LP-00 after turnaround request-MPU	$4 \times T_{LPXD}$		ns	Output

Table 8 Mipi Interface Low Power Mode Timing Characteristics

### 7.3 DSI Bursts Mode

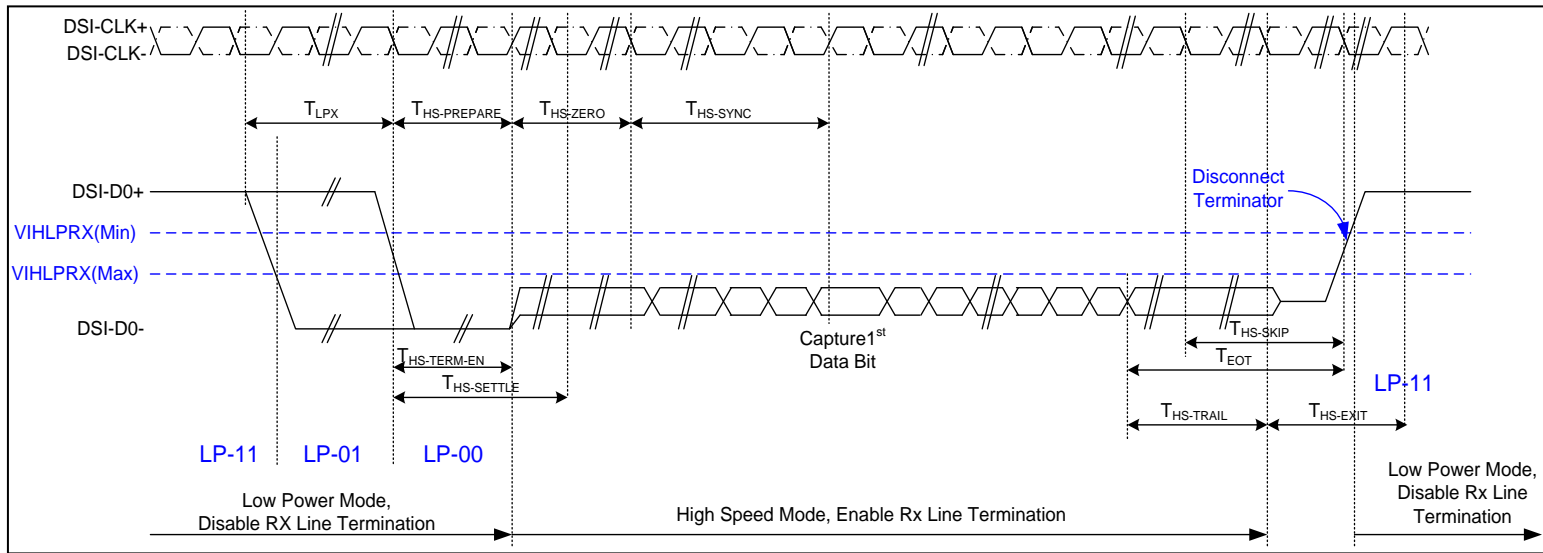


Figure 7 Data lanes-Low Power Mode to/from High Speed Mode Timing

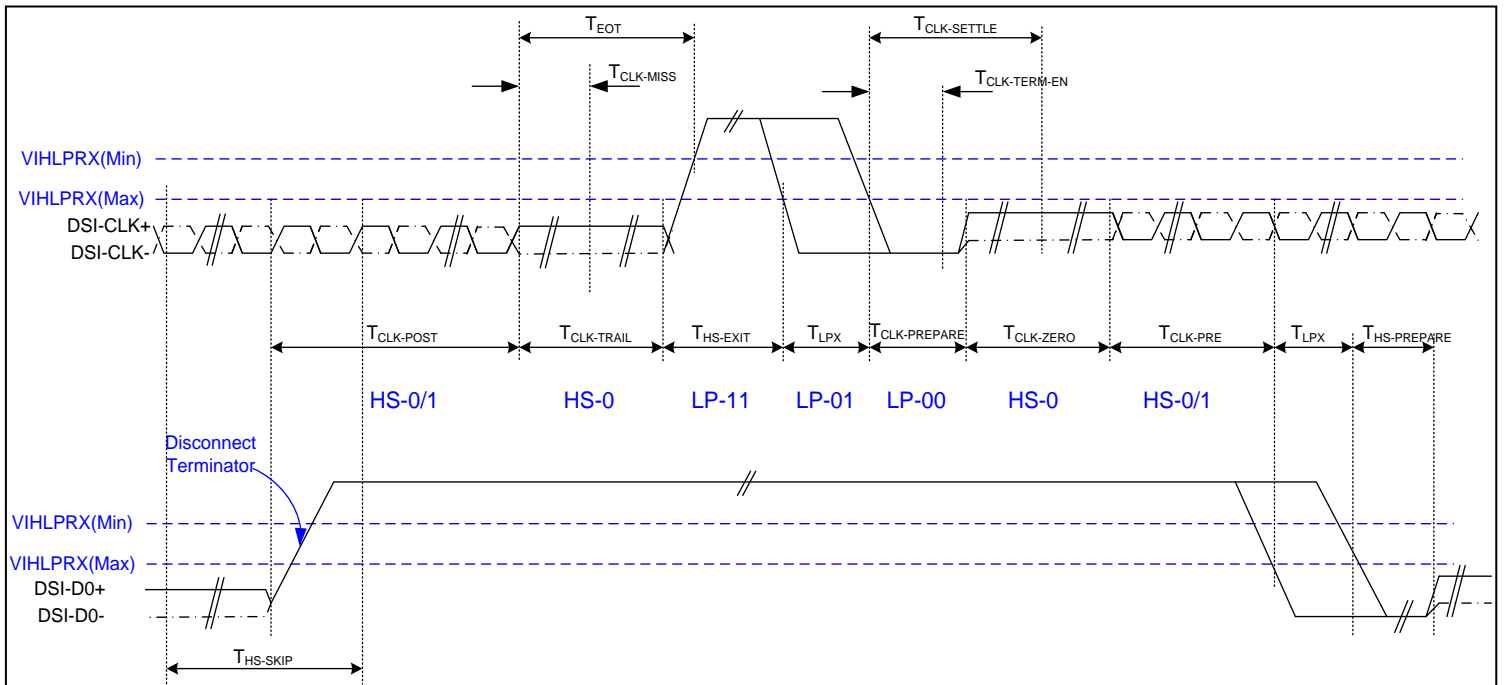
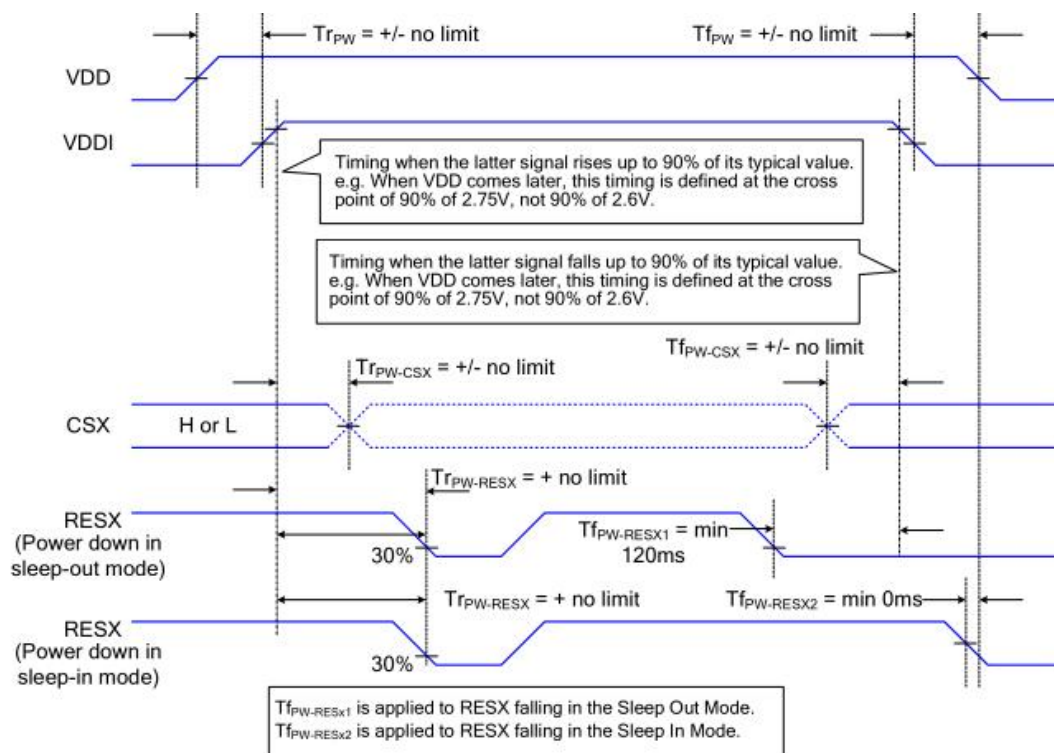


Figure 8 Clock lanes- High Speed Mode to/from Low Power Mode Timing

VDDI=1.8, VDD=2.8, AGND=DGND=0V, Ta=25 °C

Signal	Symbol	Parameter	MIN	MAX	Unit	Description
Low Power Mode to High Speed Mode Timing						
DSI-Dn+/-	TLPX	Length of any low power state period	50	-	ns	Input
DSI-Dn+/-	THS-PREPARE	Time to drive LP-00 to prepare for HS transmission	40+4 UI	85+6 UI	ns	Input
DSI-Dn+/-	THS-TERM-EN	Time to enable data receiver line termination measured from when Dn crosses VILMAX	-	35+4 UI	ns	Input
DSI-Dn+/-	THS-PREPARE + THS-ZERO	THS-PREPARE + time to drive HS-0 before the sync sequence	140+ 10UI	-	ns	Input
High Speed Mode to Low Power Mode Timing						
DSI-Dn+/-	THS-SKIP	Time-out at display module to ignore transition period of EoT	40	55+4 UI	ns	Input
DSI-Dn+/-	THS-EXIT	Time to drive LP-11 after HS burst	100	-	ns	Input
DSI-Dn+/-	THS-TRAIL	Time to drive flipped differential state after last payload data bit of a HS transmission burst	60+4 UI	-	ns	Input
High Speed Mode to/from Low Power Mode Timing						
DSI-CLK+/-	TCLK-POS	Time that the MPU shall continue sending HS clock after the last associated data lane has transition to LP mode	60+5 2UI	-	ns	Input
DSI-CLK+/-	TCLK-TRAIL	Time to drive HS differential state after last payload clock bit of a HS transmission burst	60	-	ns	Input
DSI-CLK+/-	THS-EXIT	Time to drive LP-11 after HS burst	100	-	ns	Input
DSI-CLK+/-	TCLK-PREPARE	Time to drive LP-00 to prepare for HS transmission	38	95	ns	Input
DSI-CLK+/-	TCLK-TERM-EN	Time-out at clock lan display module to enable HS transmission	--	38	ns	Input
DSI-CLK+/-	TCLK-PREPARE + TCLK-ZERO	Minimum lead HS-0 drive period before starting clock	300	-	ns	Input
DSI-CLK+/-	TCLK-PRE	Time that the HS clock shall be driven prior to any associated data lane beginning the transition from LP to HS mode	8UI	-	ns	Input
DSI-CLK+/-	TEOT	Time form start of TCLK-TRAIL period to start of LP-11 state	-	105n s+12 UI	ns	Input

## 7.4 VCI (VDD) IOVCC( VDDI ) off/on power sequence



## 8. Reset Timing

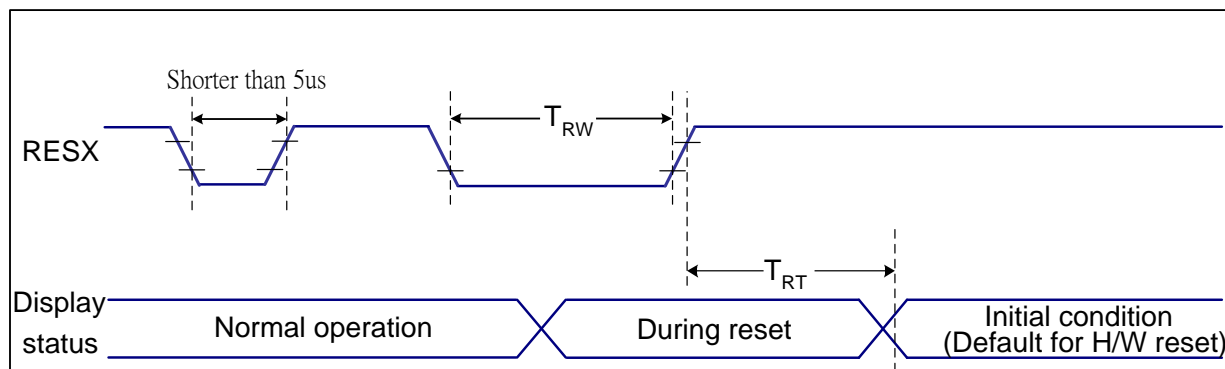


Figure 9 Reset Timing

VDDI=1.8, VDD=2.8, AGND=DGND=0V, Ta=25 °C

Related Pins	Symbol	Parameter	MIN	MAX	Unit
RESX	TRW	Reset pulse duration	10	-	us
	TRT	Reset cancel	-	5 (Note 1, 5)	ms
			120 (Note 1, 6, 7)	ms	

Table 9 Reset Timing

Notes:

- The reset cancel includes also required time for loading ID bytes, VCOM setting and other settings from NVM (or similar device) 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.
- 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 5us	Reset Rejected
Longer than 9us	Reset
Between 5us and 9us	Reset starts

- 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 return to Default condition for Hardware Reset.

- Spike Rejection also applies during a valid reset pulse as shown below:

## 9.ELECTRO-OPTICAL CHARACTERISTICS

### 9.1 Overview

The test of view angle range shall be measured in a dark room (ambient luminance  $\leq 1$ lux and temperature =  $25 \pm 2^\circ\text{C}$ ) with the equipment of Luminance meter system (Goniometer system and TOPCON CS2000/CA310) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of  $\theta$  and  $\Phi$  equal to  $0^\circ$ . We refer to  $\theta \varnothing = 0$  ( $= \theta 3$ ) as the 3 o'clock direction (the "right"),  $\theta \varnothing = 90$  ( $= \theta 12$ ) as the 12 o'clock direction ("upward"),  $\theta \varnothing = 180$  ( $= \theta 9$ ) as the 9 o'clock direction ("left") and  $\theta \varnothing = 270$  ( $= \theta 6$ ) as the 6 o'clock direction ("bottom"). While scanning  $\theta$  and/or  $\varnothing$ , the center of the measuring spot on the Display surface shall stay fixed. The luminance, color and uniformity (etc) should be tested by CS2000/CA310. The backlight should be operating for 10 minutes prior to measurement. VDD shall be  $3.3 \pm 0.3\text{V}$  at  $25^\circ\text{C}$ . Optimum viewing angle direction is 6 'clock

<Table 4. Optical Specifications>

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	$\Theta_3$	CR > 10	70	80	-	Deg.	Note 1
		$\Theta_9$		70	80	-	Deg.	
	Vertical	$\Theta_{12}$		70	80	-	Deg.	
		$\Theta_6$		70	80	-	Deg.	
Luminance Contrast ratio		CR	$\Theta = 0^\circ$	700	1000	-		Note 2
Color Gamut	NTSC	CIE1931	$\Theta = 0^\circ$	55	60	-	%	Note 3
Reproduction of color	White	Wx	$\Theta = 0^\circ$	Typ	0.315	Typ +0.03		
		Wy		-0.03	0.349			
Response Time		Tr+Td	Ta= $25^\circ\text{C}$ $\Theta = 0^\circ$	-	25	35	ms	Note 4

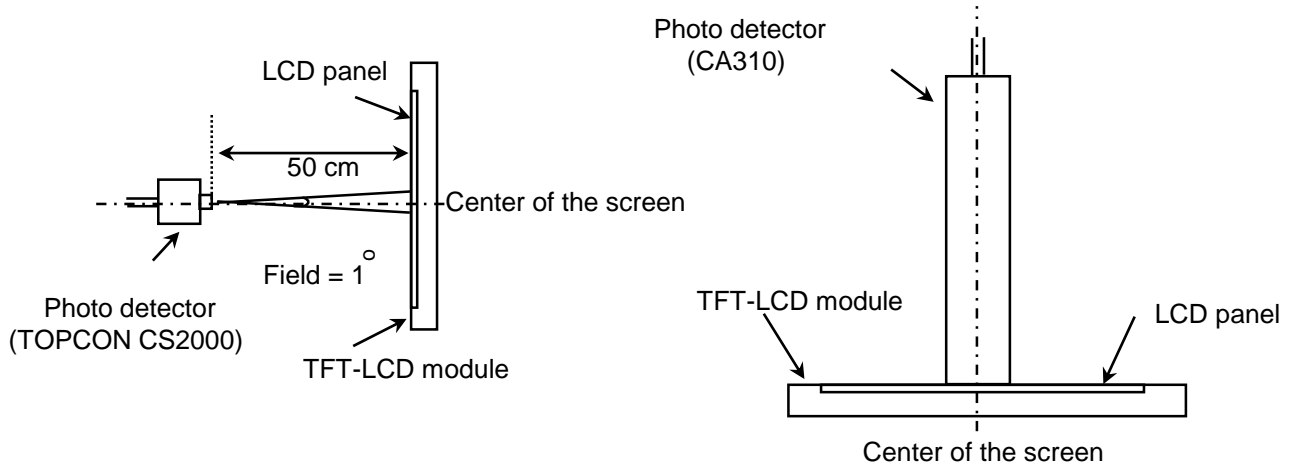
- Notes :
1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).
  2. Contrast measurements shall be made at viewing angle of  $\Theta = 0$  and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. (see FIGURE 1) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. The color chromaticity coordinates specified in Table 5. shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.
4. The electro-optical response time measurements shall be made as FIGURE 2 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is  $T_r$ , and 90% to 10% is  $T_d$ .

## 9.2 Optical measurements

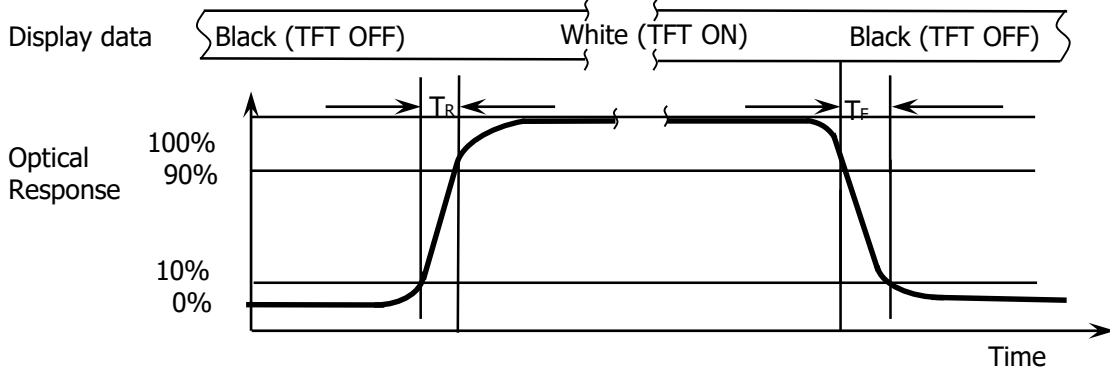
**Figure 4. Measurement Set Up**



View angel range, uniformity, etc. measurement setup

Flicker, measurement setup

**Figure 5. Response Time Testing**



The electro-optical response time measurements shall be made as shown in FIGURE 3 by switching the “data” input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is  $T_r$  and 90% to 10% is  $T_d$ .

## 10.RELIABILITY TEST

Reliability test conditions ( Polarizer characteristics null )

No.	Items	Condition	Inspection after test
1	High Temperature Storage	T = 80°C ± 2°C for 48 hr	Inspection after 4 hours storage at room temperature, the sample shall be free from defects: 1.Air bubble in the LCD 2.Sealleak; 3.Non-display; 4.missing segments; 5.Glass crack; 6.Current Idd is twice higher than initial value.
2	Low Temperature Storage	T = -30°C ± 2°C for 48 hr	
3	High Temperature Operating	T = 70°C ± 2°C for 48 hr	
4	Low Temperature Operating	T = -20°C ± 2°C for 48 hr (But no condensation of dew)	
5	High Temp. and High Humidity Operating	T = 60°C ± 5°C /90% for 48 hr (But no condensation dew)	
6	Thermal Shock	-20±2°C~25~70±2°C×10cycles (30min.) (5min.) (30min.)	
7	Dropping test (non-operation)	Drop to the ground from 76cm height, one time, every side of carton. (Packing condition)	
8	Packing Vibration (non-operation)	Frequency: 10Hz~55Hz~10Hz Amplitude: 1.0mm, X, Y, Z direction for total 3hours (Packing condition)	
9	ESD	Voltage:±6KV R: 330Ω C: 150pF Air discharge, 10time	

Note:

- (1)The test samples should be applied to only one test item.
- (2)Sample size for each test item is 5~10pcs.
- (3)In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judge as a good part.  
Using ionizer(an antistatic blower) is recommended at working area in order to reduce electro-static voltage.  
When removing protection film from LCM panel, peel off the tag slowly ( recommended more than one second) while blowing with ionizer toward the peeling face to minimize ESD which may damage electrical circuit.
- (4) Please use automatic switch testing mode when test operating mode.

## 11.PRECAUTIONS FOR USE OF LCD MODULES

### 1. Handling Precautions

- (1) The display panel is made of glass and polarizer. As glass is fragile. It tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring. Do not subject it to a mechanical shock by dropping it or impact.
- (2) If the display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance contacts your skin or clothes, wash it off using soap and water.
- (3) Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands. This will stain the display area and degraded insulation between terminals (some cosmetics are determined to the polarizer).
- (4) The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully. Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.). Do not put or attach anything on the display area to avoid leaving marks on. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in a container before coming is contacting with room temperature air.
- (5) If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten cloth with one of the following solvents
  - Isopropyl alcohol
  - Ethyl alcoholDo not scrub hard to avoid damaging the display surface.
- (6) Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the following.
  - Water
  - Ketone
  - Aromatic solventsWipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading. Avoid contacting oil and fats.
- (7) Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.
- (8) Install the LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.
- (9) Do not attempt to disassemble or process the LCD module.
- (10) NC terminal should be open. Do not connect anything.
- (11) If the logic circuit power is off, do not apply the input signals.

- (12) Electro-Static Discharge Control, Since this module uses a CMOS LSI, the same careful attention should be paid to electrostatic discharge as for an ordinary CMOS IC. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
- Before remove LCM from its packing case or incorporating it into a set, be sure the module and your body have the same electric potential. Be sure to ground the body when handling the LCD modules.
  - Tools required for assembling, such as soldering irons, must be properly grounded. Make certain the AC power source for the soldering iron does not leak. When using an electric screwdriver to attach LCM, the screwdriver should be of ground potentiality to minimize as much as possible any transmission of electromagnetic waves produced sparks coming from the commutator of the motor.
  - To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions. To reduce the generation of static electricity be careful that the air in the work is not too dried. A relative humidity of 50%-60% is recommended. As far as possible make the electric potential of your work clothes and that of the work bench the ground potential
  - The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated
- (13) Since LCM has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it.
- Do not alter, modify or change the shape of the tab on the metal frame.
  - Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached.
  - Do not damage or modify the pattern writing on the printed circuit board.
  - Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector.
  - Except for soldering the interface, do not make any alterations or modifications with a soldering iron.
  - Do not drop, bend or twist LCM.

## 2. Storage precautions

2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature :            0°C ~ 40°C            Relatively humidity: ≤80%

2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

2.4 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.

## 12.0 Packing form-TBD



# 深圳市丽台电子有限公司

Shenzhen Leadtek Electronics Co.,Ltd

## Incoming Inspection Standard

### 品质允收标准

Model N0. /产品型号: Applicable to Leadtek Touch Display Screen

Updated Date /生效日期: 2025.04.01

Version / 版本号: V0

Record of Revision /修订履历.

Version /版本号	Revision Record /修订内容	Reviser /修订人	Revision Date /修订日期
V0	首发 / Initial release	Green	2025.04.01



## 1、Scope of application /适用范围.

适用于丽台电子触摸显示屏/ Applicable to Leadtek Touch Display Screen.

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

### 2.1、Inspection Conditions / 检验条件:

2.1.1、Inspection Distance / 检测距离: 35cm ±5cm.

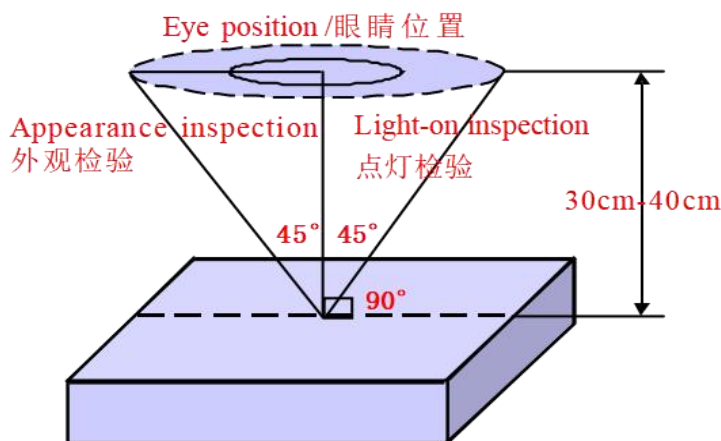
2.1.2、Inspection time /检验时间: Displays performance test /功能测试: 2~3S /Image, Appearance Inspection / 外观检验: 8~10S.

2.1.3、Inspection the viewing angle /检验视角:

Display Inspection Angle /显示检验角度: ±45°.

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

Eye position /眼睛位置:



(Perpendicular to LCD panel surface /垂直于LCD表面)

### 2.2、Inspection environment /检验环境:

Temperature / 温度		25±5°C
Humidity / 湿度		55±5%RH
Brightness	Appearance Inspection / 外观检验	800~1000 Lux
亮度	Display Inspection / 功能检验	200~300 Lux

### 2.3、Sampling conditions / 抽样方式.

Sampling Plan / 抽样计划		GB/T 2828.1- 2003
		Batch single sampling/批量单次抽样
		General inspection level: II/一般检验水平: 二级
AQL	Major Defect / 主要缺陷	0.25
	Minor Defect / 次要缺陷	0.65

### 3、Terms and definitions / 术语和定义.

#### 3.1、Defect classification / 缺陷分类:

3.1.1、Major defects / 主要缺陷: Defects that cause the product to fail or reduce the usability of the product / 引起产品功能失效和减少产品的有效使用与操作的缺陷.

3.1.2、Minor defects / 次要缺陷: Defects that do not affect the functionality and effective use and operation of the product / 不影响产品功能和有效使用与操作的缺陷.

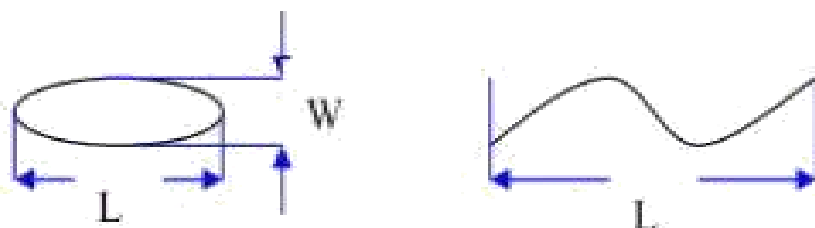
#### 3.2、Point defects / 点状缺陷:

The size of a punctate defect is defined by the diameter D, and the average diameter of the defect is  $D=1/2(W+L)$  / 点状缺陷由直径 D 定义大小, 缺陷的平均直径  $D=1/2(W+L)$ .

#### 3.3、line 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-pixels / LCD 子像素点:

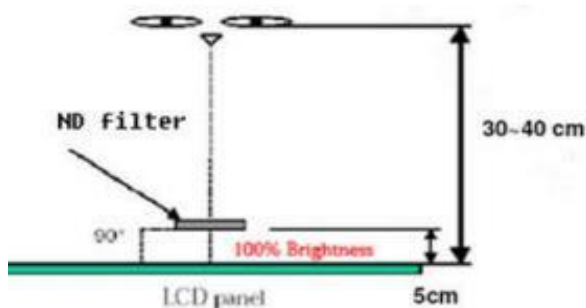
The sub-pixel defect area is greater than 50% of the LCD sub-pixel area, and is visible through ND5% masking

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.

### 3.5、ND card test method / ND 卡检验方法:

Hold the ND card 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.



3.6、Surface substances that can be cleaned are not considered defects (e.g. finger prints on the protective film, dust particles)

可以被清洁干净的表面物质不视为缺陷 (如保护膜上的手指印, 尘粒) .

3.7、Defects that can be covered by the material and are not visible to the eye, and do not affect the function and use are not considered defects

能被物料覆盖目视不可见, 且不影响功能与使用的缺陷不视为缺陷.

3.8、AA shows that damage to the glass outside the area does not affect the effective line and does not expand the loss is acceptable

AA 显示区域以外的玻璃损伤, 不影响有效线路和不会在扩大损失的是可以接受的.

3.9、Issues not specified or defined in this document shall be dealt with through friendly negotiation between the parties / 本文件中未规定或定义的问题, 双方友好协商处理.

## 4.0、Inspection standards /检验标准:

### 4.1、Structural size standards / 结构尺寸标准:

Measurement items /测量项目		Specification /规格	Remark /备注
Name/名称	Unit /单位	Tolerance /公差	
Outside dimension: Length 尺寸: 长	mm /毫米	0.10mm~0.3mm	Please refer to the product specification for detailed dimensions and tolerances 详细的尺寸规格和公差请参考产品规格书
Outside dimension: Width 尺寸: 宽	mm /毫米	0.10mm~0.3mm	
Outside dimension: Thickness 尺寸: 厚	mm /毫米	0.20mm~0.50mm	

### 4.2、Appearance Inspection standards:

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

Material 检验区域	Inspection items 检验项目	Product size 适用尺寸	Inspection standards 检验规格	Category 缺陷类别	
LCD	ITO	Full size 全尺寸	ITO can't open circuit, short circuit, ITO notch cannot exceed 70% of width. ITO 不能有开路 and 短路, ITO 缺口不能超过宽度的70%.	MA	
	Corners broken 崩边/崩角	Full size 全尺寸	1、 It cannot affect the appearance of valid routes and functions; 不能影响有效线路和功能外观.	MA	
			2、 There must be no extensible rips 不能有可延伸性裂纹.	MA	
Silicone 硅胶	Silicone coating 硅胶涂布	Full size 全尺寸	1、 The height cannot exceed the LCD CF surface / 高度不能超过 LCD CF 面.		MI
			2、 No overflow and lack of glue / 不能溢胶 and 缺胶.		MI
			3、 Silicone cannot cover POL and FPC/ 硅胶不能覆盖到 POL and FPC.		MI

Material 检验区域	Inspection items 检验项目	Product size 适用尺寸	Inspection standards 检验规格	Category 缺陷类别	
PCBA FPC Connector 连接器	Appearance 表面外观	Full size 全尺寸	1.FPC is not allowed to have drape/bubble/fold / 不允许有披锋/气泡/褶皱.		MI
			2.Surface scratches do not allow copper leakage / 表面划伤不允许出现漏铜.	MA	
			3.Cracking is not allowed / 不允许破裂.	MA	
			4.Gold finger oxidation is not allowed 不允许金手指氧化.	MA	
			5.Chromatic aberration is not allowed 不允许出现色差.	MA	
	Components 元器件	Full size 全尺寸	1. Damage, missing parts, and incorrect models are not allowed 不允许损伤、缺件、型号错误.	MA	
			2.Components need to be insulated with high temperature adhesive (unless not required by the drawings) / 元器件需要有高温胶绝缘保护 (除非图纸无要求) .		MI
			3.The pads need to be glued with high temperature (unless not required by the drawings) / 焊盘需贴高温胶 (除非图纸无要求) .		MI
	Weld 焊接	Full size 全尺寸	1. False soldering, virtual soldering, and tinning are not allowed 不允许假焊、虚焊、连锡.	MA	
			2. No solder bead residue is allowed 不允许有锡珠残留.		MI
3.The pads need to be glued with high temperature (unless not required by the drawings) / 焊盘需贴高温胶 (除非图纸无要求) .				MI	
POL 偏光片	Scratches 划伤	Under 6 inches 6寸以下	1.W≤0.05mm; L≤5mm, Ignore (忽略) . 2.0.05mm < W≤0.10mm ; L≤5mm ; N≤2; DS≥10mm. 3.0.10mm < W; 5mm < L, Not allowable (不允许) .		MI
		6~10.0 inches 6寸~10.0寸	1.W≤0.07mm; L≤5mm, Ignore (忽略) . 2.0.07mm < W≤0.12mm ; L≤10mm ; N≤3 ; DS≥10mm. 3.0.12mm < W; 10mm < L, Not allowable (不允许) .		MI
		More than 10 inches 10寸以上	1.W≤0.10mm; L≤5mm, Ignore (忽略) . 2.0.10mm < W≤0.15mm ; L≤10mm ; N≤4 ; DS≥10mm. 3.0.15mm < W; 10mm < L, Not allowable (不允许) .		MI

Material 检验区域	Inspection items 检验项目	Product size 适用尺寸	Inspection standards 检验规格	Category 缺陷类别	
POL 偏光片	Bubbles	Under 6 inches 6寸以下	1.D≤0.15mm, Ignore (忽略) . 2.0.15mm < D≤0.30mm; N≤2; DS≥10mm. 3.D > 0.30mm, Not allowable (不允许) .		MI
		More than 6 inches 6寸以上	1.D≤0.20mm, Ignore (忽略) . 2.0.20mm < D≤0.40mm; N≤3; DS≥10mm. 3.D > 0.40mm, Not allowable (不允许) .		MI
	Bubbles around the edges 边缘气泡	Full size 全尺寸	1.Within 1/2BM of the display area, it is not allowed 显示区往外 1/2BM 区域内, 不允许. 2.The display area is 1/2 outside the BM area, and it is not controlled 显示区往外 1/2BM 区域以外, 不管控.		MI
	Point defects Embossing	Under 6 inches 6寸以下	1.D≤0.15mm, Ignore (忽略) . 2.0.15mm < D≤0.30mm; N≤2; DS≥10mm. 3.D > 0.30mm, Not allowable (不允许) .		MI
		6~10.0 inches 6寸~10.0寸	1.D≤0.20mm, Ignore (忽略) . 2.0.20mm < D≤0.40mm; N≤3; DS≥10mm. 3.D > 0.40mm, Not allowable (不允许) .		MI
		More than 10 inches 10寸以上	1.D≤0.25mm, Ignore (忽略) . 2.0.25mm < D≤0.50mm; N≤4; DS≥10mm. 3.D > 0.50mm, Not allowable (不允许) .		MI
	Dirty 脏污	Full size 全尺寸	Dirt, finger prints, etc. are not allowed 不允许有脏污、手指印等.		MI
	Warping 起翘	Full size 全尺寸	Not allowed 不允许.		MI
	Paste offset 贴附偏位	Full size 全尺寸	It is not allowed to exceed the patch tolerance required by the drawing; After TP lamination, it is not allowed to leak the edges of the polarizer 不允许超出图纸要求的贴片公差; 在 TP 贴合后不允许漏偏光片边缘.		MI
	Angle mistake 角度错误	Full size 全尺寸	Not allowed 不允许.		MA
Mixture 混料	Full size 全尺寸	Not allowed 不允许.		MA	

Material 检验区域	Inspection items 检验项目	Product size 适用尺寸	Inspection standards 检验规格	Category 缺陷类别	
TP	Scratches 划伤	Under 6 inches 6寸以下	1.W≤0.05mm; L≤5mm, Ignore (忽略) . 2.0.05mm < W≤0.10mm ; L≤5mm ; N≤2 ; DS≥10mm. 3.0.10mm < W; 5mm < L, Not allowable (不允许) . 4.There is a feeling scratch, Not allowable 有感划伤, 不允许.		MI
		6~10.0 inches 6寸~10.0寸	1.W≤0.07mm; L≤5mm, Ignore (忽略) . 2.0.07mm < W≤0.12mm ; L≤10mm ; N≤3 ; DS≥10mm. 3.0.12mm < W; 10mm < L, Not allowable (不允许) . 4.There is a feeling scratch, Not allowable 有感划伤, 不允许.		MI
		More than 10 inches 10寸以上	1.W≤0.10mm; L≤5mm, Ignore (忽略) . 2.0.10mm < W≤0.15mm ; L≤10mm ; N≤4 ; DS≥10mm. 3.0.15mm < W; 10mm < L, Not allowable (不允许) . 4.There is a feeling scratch, Not allowable 有感划伤, 不允许.		MI
	Black dots white dots 黑点/白点	Under 6 inches 6寸以下	1.D≤0.15mm, Ignore (忽略) . 2.0.15mm < D≤0.30mm; N≤2; DS≥10mm. 3.D > 0.30mm, Not allowable (不允许) .		MI
		6~10.0 inches 6寸~10.0寸	1.D≤0.20mm, Ignore (忽略) . 2.0.20mm < D≤0.40mm; N≤3; DS≥10mm. 3.D > 0.40mm, Not allowable (不允许) .		MI
		More than 10 inches 10寸以上	1.D≤0.25mm, Ignore (忽略) . 2.0.25mm < D≤0.50mm; N≤4; DS≥10mm. 3.D > 0.50mm, Not allowable (不允许) .		MI
	OCA Bubbles 气泡	Full size 全尺寸	Not allowed 不允许.		MI
	Corners broken 崩边/崩角	Full size 全尺寸	1.Product front /产品正面: Edge and corner chipping is not allowed / 崩角、崩边不允许 2.Product back /产品背面: X≤0.5, Y≤0.5, Z≤1/2T; N≤4; DS≥10mm.	MA	
	Silk screen 丝印	Full size 全尺寸	The silk screen is clear, complete and correct 丝印清晰、完整、内容正确.		MI

Material 检验区域	Inspection items 检验项目	Product size 适用尺寸	Inspection standards 检验规格	Category 缺陷类别
TP	Dirty 脏污	Full size 全尺寸	Uncleanable dirt, Not allowable. 不可擦拭的脏污, 不允许.	MI
	Broken 破损	Full size 全尺寸	Not allowable. 不允许.	MI
	Ink color aberration 油墨色差	Full size 全尺寸	$\Delta E > 1$ , Not allowable (不允许).	MI
	Cover pinholes 针孔	Full size 全尺寸	1.D $\leq$ 0.20mm, N $\leq$ 2, DS $\geq$ 10mm, allowable 2.D > 0.20mm, intensive pinholes (密集型针孔), Not allowable (不允许).	MI
	Paint off 掉漆	Full size 全尺寸	Touch-up on the back of the cover is allowed, and the touch-up area cannot exceed 2.0mm in diameter / 允许在盖板背面补漆, 补漆面积不能超过直径 2.0mm.	MI
BL 背光	Backlight separation 背光分离	Full size 全尺寸	Not allowable 不允许.	MI
	Deformed 变形	Full size 全尺寸	Measured using a plug gauge, If the deformation exceeds 0.3mm, NG is judged 使用塞规测量, 形变超过 0.3mm, 判定 NG.	MI
	Iron frame Oxidation /abscission 铁框氧化/脱落	Full size 全尺寸	Not allowable 不允许.	MI
	Dirt/adhesive residue/solder beads 脏污/残胶/锡珠	Full size 全尺寸	Not allowable 不允许.	MI
	Inkjet/barcode/ QR code 喷码/条码/二维码	Full size 全尺寸	The inkjet code is clear and complete, the barcode and QR code can be scanned normally, and the content and format meet the requirement / 喷码清晰完整、条码和二维码可正常扫描, 内容和格式与要求相符.	MI
	Auxiliary materials 辅料	Full size 全尺寸	Accessories (vinyl, double-sided tape, insulating glue, etc.) are not allowed to be missed, misguided, defective, etc 辅料(黑胶、双面胶、绝缘胶等)不允许有漏贴、贴偏、残缺等.	MI

### 4.3、Functional inspection standards:

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

Material 检验区域	Inspection items 检验项目	Product size 适用尺寸	Inspection standards 检验规格	Category 缺陷类别	
Display Screen 模组	Light leakage / Mura 漏光/ Mura	Full size 全尺寸	1.Use ND5% filter masking, visual invisibility is OK 使用 ND5%遮盖, 目视不可见即为 OK. 2.If necessary, sign off on the sample 必要时, 签限定样.		MI
	Brightness uniformity 亮度均匀性	Full size 全尺寸	Brightness uniformity < 85.0%, Not allowable 亮度均匀性 < 85.0%, 不允许.	MA	
	LCD bright spots/dark spots 玻璃亮点/暗点	Under 6 inches 6寸以下	1.D≤0.10mm, Ignore (忽略) . 2.0.10mm < D≤0.20mm; N≤2; DS≥10mm. 3.D > 0.20mm, Not allowable (不允许) .		MI
		6~10.0 inches 6寸~10.0寸	1.D≤0.15mm, Ignore (忽略) . 2.0.15mm < D≤0.30mm; N≤3; DS≥10mm. 3.D > 0.30mm, Not allowable (不允许) .		MI
		More than 10 inches 10寸以上	1.D≤0.20mm, Ignore (忽略) . 2.0.20mm < D≤0.40mm; N≤4; DS≥10mm. 3.D > 0.40mm, Not allowable (不允许) .		MI
	Backlight black dots/white dots 背光黑点/白点	Under 6 inches 6寸以下	1.D≤0.15mm, Ignore (忽略) . 2.0.15mm < D≤0.30mm; N≤2; DS≥10mm. 3.D > 0.30mm, Not allowable (不允许) .		MI
		6~10.0 inches 6寸~10.0寸	1.D≤0.20mm, Ignore (忽略) . 2.0.20mm < D≤0.40mm; N≤3; DS≥10mm. 3.D > 0.40mm, Not allowable (不允许) .		MI
		More than 10 inches 10寸以上	1.D≤0.25mm, Ignore (忽略) . 2.0.25mm < D≤0.50mm; N≤4; DS≥10mm. 3.D > 0.50mm, Not allowable (不允许) .		MI
	Linear foreign bodies 线状异物	Under 6 inches 6寸以下	1.W≤0.05mm; L≤5mm, Ignore (忽略) . 2.0.05mm < W≤0.10mm ; L≤5mm ; N≤2; DS≥10mm. 3.0.10mm < W; 5mm < L, Not allowable (不允许) .		MI
		6~10.0 inches 6寸~10.0寸	1.W≤0.07mm; L≤5mm, Ignore (忽略) . 2.0.07mm < W≤0.12mm ; L≤10mm ; N≤3 ; DS≥10mm. 3.0.12mm < W; 10mm < L, Not allowable (不允许) .		MI
		More than 10 inches 10寸以上	1.W≤0.10mm; L≤5mm, Ignore (忽略) . 2.0.10mm < W≤0.15mm ; L≤10mm ; N≤4 ; DS≥10mm. 3.0.15mm < W; 10mm < L, Not allowable (不允许) .		MI

Material 检验区域	Inspection items 检验项目	Product size 适用尺寸	Inspection standards 检验规格	Category 缺陷类别	
Display Screen 模组	White/Black print 白印/黑印	Full size 全尺寸	Use ND5% filter masking, visual invisibility is OK 使用 ND5%遮盖, 目视不可见即为 OK.		MI
	Interference pattern/Newtonian pattern 干涉纹/牛顿纹	Full size 全尺寸	Not allowable 不允许.		MI
	Membranes displacement 膜材移位	Full size 全尺寸	Not allowable 不允许.		MI
	Color blocks 色斑	Full size 全尺寸	Use ND5% filter masking, visual invisibility is OK /使用 ND5%遮盖, 目视不可见即为 OK.		MI
	Display abnormal 画异	Full size 全尺寸	Not allowable 不允许.	MA	
	No display 无显示	Full size 全尺寸	Not allowable 不允许.	MA	
	Line/Missing Drawing 线条/缺画	Full size 全尺寸	Not allowable 不允许.	MA	
	Splash screen 闪屏	Full size 全尺寸	Not allowable 不允许.	MA	
	LCD grid LCD 网格	Full size 全尺寸	Not allowable 不允许.	MA	
	Afterimage 残影	Full size 全尺寸	Not allowable 不允许.	MA	
	Wrong viewing angle 可视角错误	Full size 全尺寸	Not allowable 不允许.	MA	
TP	No touch 无触摸	Full size 全尺寸	Not allowable 不允许.	MA	
	Touch the jump point 触摸跳点	Full size 全尺寸	Not allowable 不允许.	MA	
	Touch not sensitive 触摸不灵敏	Full size 全尺寸	Not allowable 不允许.	MA	