Shenzhen Leadtek Electronics Co.,Ltd

PRODUCT SPECIFICATION

TFT-LCD MODULE

Module No：LTK055FTMCT21-V2

☑ Preliminary Specification

☐ Approval Specification

Designed by	Checked by	Approved by
jona	Jams	lan

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.

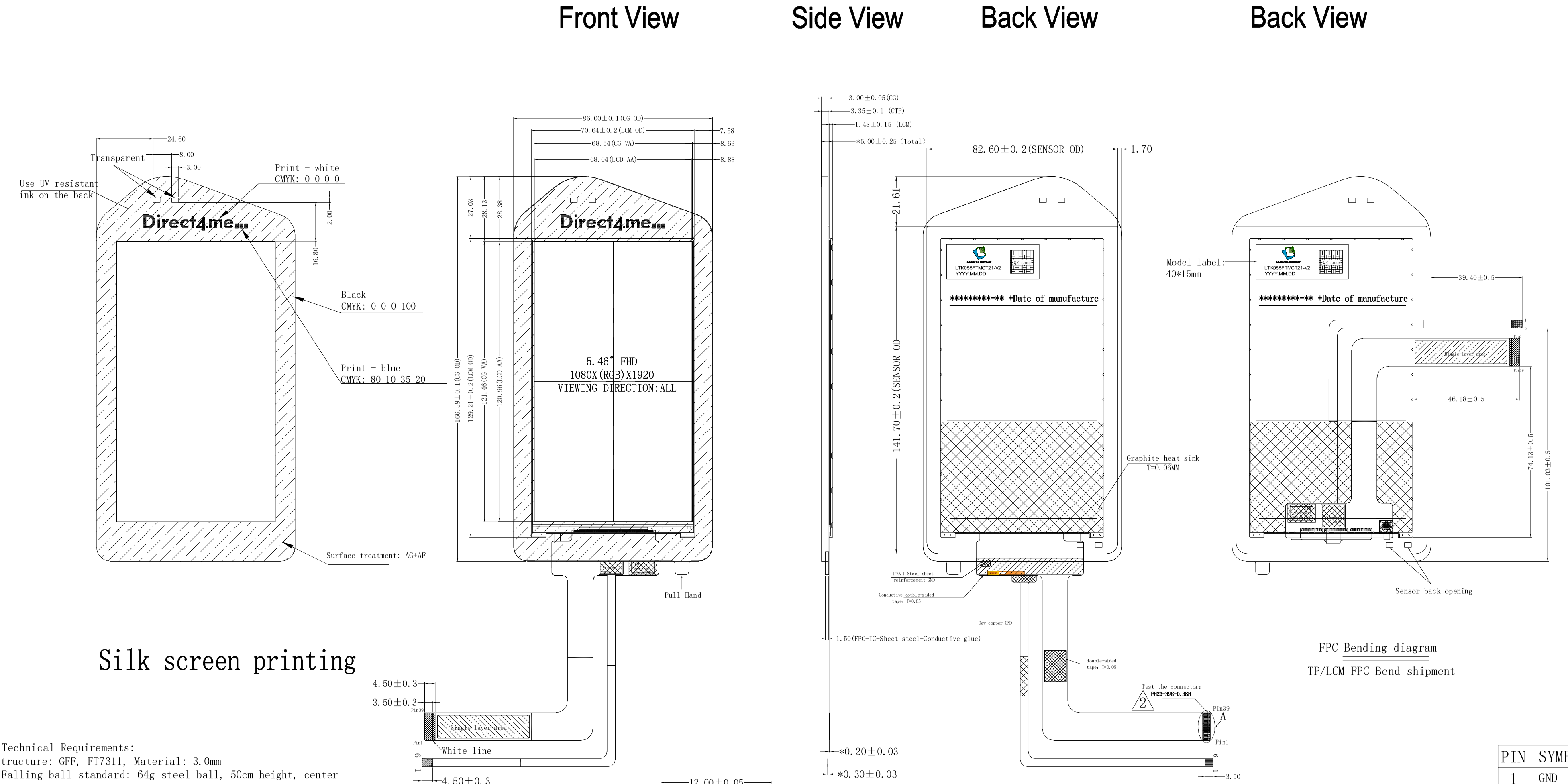
1. Document Revision History

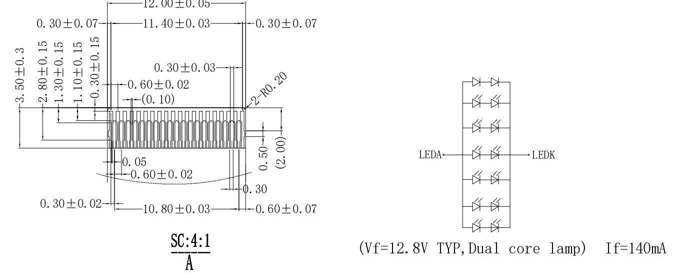
Version	Contents	Date	Note
V0	Initial version	2024.12.28	
V1	Remove double-sided adhesive tape on the back of CG	2025.02.26	
V2	The driver IC has been changed from Hx8399C to ST7105S, and the connector	2025.08.28	

2. General Description

N0	Item	Specification	Unit	Remark
1	LCD Size	TFT"5.5	inch	-
2	Panel Type	IPS	-	-
3	Display Resolution	1080 x RGB x 1920	pixel	-
4	Display mode	Normally Black	-	-
5	Display colors	16.7M	-	-
6	Viewing Direction	ALL	-	-
7	CTP+LCM Module size	86.00(W)×166.59(H)×5.0(T)	mm	Note
8	Active Area	68.04(W) x 120.96(H)	mm	Note
9	Pixel Pitch	0.063(H) x 0.063(V)	mm	-
10	Weight	TBD	g	-
11	Driver IC	ST7105S	bit	-
12	Light Source	White LED	-	-
13	Interface	MIPI	-	-

3.EXTERNAL DIMENSIONS





TP Technical Requirements:
1.Structure: GFF, FT7311, Material: 3.0mm
2. Falling ball standard: 64g steel ball, 50cm height, center point three times, no crushing.
3. Back Film attainment factor: ≥30, ink attainment value: ≥32
4. Surface hardness>6H, strengthening parameters: CS≥450MPa, DOL ≥30um; 4PB≥400MPa
5. Uninjected side: C=0.15*0.15; Unannotated tolerance: ±0.2
6. Environmental protection in line with RoHS and REACH requirements;

Notes:
1. Display : 5.46", FHD TFT
2. Resolution: 1080xRGBx1920
3. LCD Viewing Direction: ALL,
4. Drive IC:ST7105S △2
5. Display Mode: Normally Black
6. LCM+CTP Brightness: 650cd/m²(TYP), uniformity≥80%
7. *:Critical dimension:( )Reference dimension, unmark Tolerance:±0.2
8. OPERATING TEMP: -20° C~ +70° C
9. STORAGE TEMP: -30° C~ +80° C
10. Requirements on Environmental Protection: ROHS

PIN	SYMBOL
1	GND
2	RESET 1.8V
3	SCL 1.8V
4	SDA 1.8V
5	INT 1.8V
6	VDD2.8V

PIN	SYMBOL
1	ID
2	LED K
3	LED K
4	NC
5	LED A
6	LED A
7	NC
8	GND
9	GND
10	D3N
11	GND
12	D3P
13	GND
14	D0N
15	GND
16	D0P
17	GND
18	CLKN
19	GND
20	CLKP
21	GND
22	D1N
23	GND
24	D1P
25	GND
26	D2N
27	GND
28	D2P
29	GND
30	GND
31	TE
32	GND
33	NC
34	VDD2.85V
35	GND
36	VDDI 1.8V
37	RES
38	NC
39	NC

REV	DESCRIPTION	DATE	NAME
△3			
△2	The driver IC has been changed from Hx8399C to ST7105S, and the connector structure has been adjusted.	2025.07.19	kevin
△1	Remove double-sided adhesive tape on the back of CG	2025.02.26	IAN
△0	NEW	2024.12.26	IAN

LEADTEK DISPLAY

Shenzhen Leadtek Electronics Co.,Ltd

SCALE:1/1	UNIT:mm	PAGE:1/1		Approve	Check	Drawn
Part No:	LTK055FTMCT21		VER:V2	IAN	JONA	Kevin
Customer No:						

4.INTERFACE SIGNAL

Pin No.	Symbol	Description
1	ID	ID
2	LEDK	LED backlight cathode.
3	LEDK	LED backlight cathode.
4	NC	NC
5	LEDA	LED backlight anode.
6	LEDA	LED backlight anode.
7	NC	NC
8	GND	Power ground
9	GND	Power ground
10	D3N	MIPI-DSI data lane 3 negtive input pin.
11	GND	Power ground
12	D3P	MIPI-DSI data lane 3 positive input pin.
13	GND	Power ground
14	D0N	MIPI-DSI data lane 0 negtive input pin.
15	GND	Power ground
16	D0P	MIPI-DSI data lane 0 positive input pin.
17	GND	Power ground
18	CLKN	MIPI-DSI data lane negtive input pin.
19	GND	Power ground
20	CLKP	MIPI-DSI data lane positive input pin.
21	GND	Power ground
22	D1N	MIPI-DSI data lane 1 negtive input pin.
23	GND	Power ground
24	D1P	MIPI-DSI data lane 1 positive input pin.
25	GND	Power ground
26	D2N	MIPI-DSI data lane 2 negtive input pin.
27	GND	Power ground
28	D2P	MIPI-DSI data lane 2 positive input pin.
29	GND	Power ground
30	GND	Power ground
31	TE	Tearing Effect Output Pin
32	GND	Power ground

33	NC	NC
34	VDD2.85V	Power supply for the analog power.
35	GND	Power ground
36	VDDI 1.8V	Power supply for the logic power and I/O circuit.
37	RES	Reset signal(low active)
38	NC	NC
39	NC	NC

5.ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit	Note
Power Supply voltage 1	VCI~GND	-0.3	+3.3	V	
Power Supply voltage 2	IOVCC~GND	-0.3	+1.95	V	
Logic Input Voltage Range	V_{IN}	-0.3	IOVCC+0.3	V	
Logic Output Voltage Range	V_{O}	-0.3	IOVCC+0.3	V	
Operating temperature	Topr	-20	+70	℃	
Storage temperature	Tstg	-30	+80	℃	

* 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℃

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage for analog circuit	VCI	2.5	3.3	3.3	V
Supply voltage for logic circuit	IOVCC	1.65	1.8	1.95	V
Input voltage 'H'level	V_{IH}	0.7*IOVCC	—	IOVCC	V
Input voltage 'L'level	V_{IL}	-0.3	—	0.3*IOVCC	V
Output voltage 'H'level	V_{OH}	0.8*IOVCC	—	IOVCC	V
Output voltage 'L'level	V_{OL}	0	—	0.2*IOVCC	V

6.2 Backlight Characteristics

Ta = 25℃

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward voltage	Vf	11.6	12.8	13.2	V	If=140 mA
CTP+LCM Luminance	LV	—	650	—	cd/㎡	
Number of LED	-	2X7			Piece	-
Connection mode	S/P	2Serial/7Parallel			-	-

Using condition: constant current driving method If= 2×70mA (+/-10%)

7.0 DC Characteristics

7.1 Basic Characteristics

7.2 Power Supply Voltage

(Ta = -30℃~+85℃)

Parameter	Symbol	Test Condition	Specification			Unit	Note
			MIN.	TYP.	MAX.		
Power Supply Voltage	IOVCC	-	1.65	1.8	1.95	V	
	DPHYVCC	-	1.65	1.8	1.95	V	
	AVDD	-	4.65	5.5	6.2	V	
	AVEE	-	-6.2	-5.5	-4.65	V	

7.2.1. Charge Pump and LDO Output Voltage

(Ta = 25℃)

Parameter	Symbol	Test Condition	Specification			Unit	Note
			MIN.	TYP.	MAX.		
Step-up Output Voltage	VGHS	AVDD=5.5V, AVEE=5.5V VGHSSEL=5'h0F, No load on panel		8		V	1
Charge Pump (Positive)	VGH	AVDD=5.5V, AVEE=5.5V VGHSEL=5'h0F, No load on panel		8		V	2
Charge Pump (Negative)	VGL	AVDD=5.5V, AVEE=5.5V VGLSEL=5'h0F, No load on panel		-8		V	3
Feed Through Voltage	VFT	VFTSEL=7'h1E, No load on panel	0.28	0.3	0.32	V	
source Output Voltage Dispersion	S1~S1080	V0~V63, V192~V255	-	-	35	mV	
		V64~V191	-	-	15	mV	

Note1: 2 * AVDD – 2V ≧ VGHS ≧ AVDD + 0.8V

Note2: 2 * AVDD – 2V ≧ VGH ≧ AVDD + 0.8V

Note3: 2 * AVEE + 2V ≧ VGL ≧ AVEE - 0.8V

7.2.2 Current Consumption

(Ta = 25℃)

Parameter	Power	Test Condition	Specification			Unit
			MIN.	TYP.	MAX.	
Power Supply Current	IOVCC = 1.8V AVDD = 5.5V AVEE = -5.5V	Sleep In mode No load on panel	-	290	470	uW
	IOVCC = 1.8V AVDD = 5.5V AVEE = -5.5V	Deep Standby mode No load on panel	-	5	15	uW

7.2.3 MIPI DC Characteristic

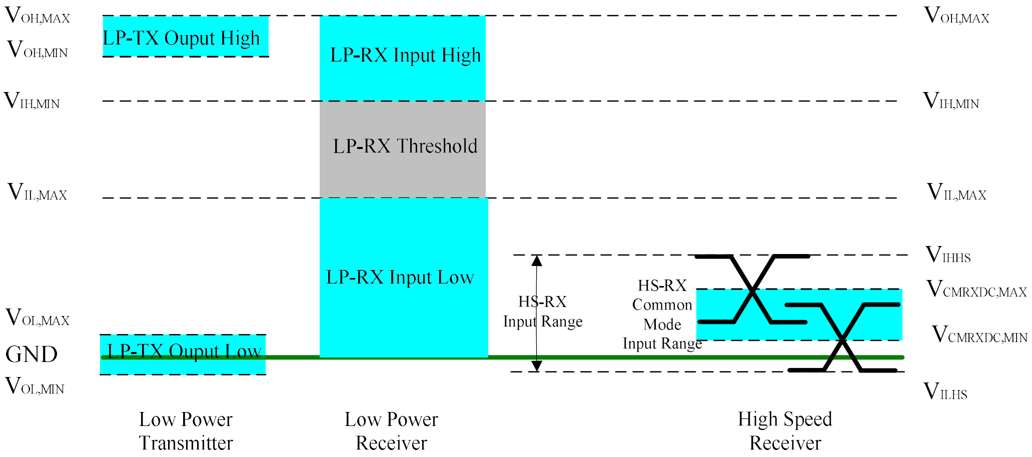


Figure 78 MIPI Signaling Voltage Levels

Parameter	Symbol	Specification			Unit
		MIN	TYP	MAX	
Operation Voltage for MIPI Receiver					
Low power mode operating voltage	VLPH	1.1	1.2	1.3	V
MIPI Characteristics for High Speed Receiver					
Single-ended input low voltage	VILHS	-40	-	-	mV
Single-ended input high voltage	VIHHS	-	-	460	mV
Common-mode voltage	VCMRXDC	70	-	330	mV
Differential input impedance	ZID	80	100	125	ohm
MIPI Characteristics for Low Power Mode					
Pad signal voltage range	VI	-50	-	1350	mV
Logic 0 input threshold	VIL	0	-	550	mV
Logic 1 input threshold	VIH	880	-	-	mV
Output low level	VOL	-50	-	50	mV
Output high level	VOH	1.1	1.2	1.3	V

7.3 AC Characteristics

7.3.1 MIPI Timing

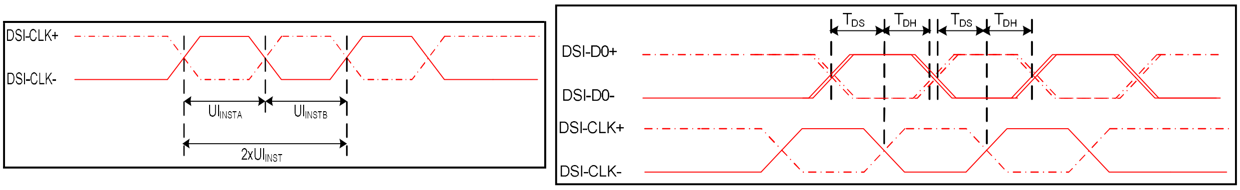


Figure 79 High Speed Mode – Clock Channel Timing

Signal	Symbol	Parameter	Specification			Unit	Description
			MIN	TYP	MAX		
DSI-CLK+/-	UIINSTA ,UIINSTB	UI instantaneous	0.87	-	12.5	ns	
fDSI-CLK+/-	FDSICLK	DSI-CLK+/- frequency	40	-	575	MHz	
DSI-Dn+/-	TDS	Data to clock setup time	0.2	-	-	UI	
DSI-Dn+/-	TDH	Data to clock hold time	0.2	-	-	UI	

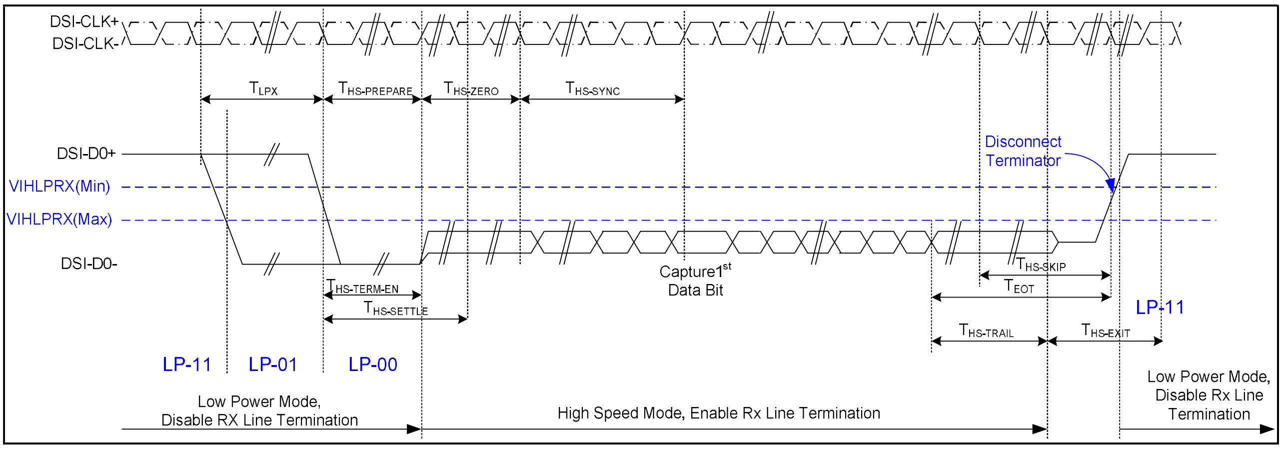


Figure 80 High-Speed Data Transmission

Parameter	Symbol	Specification			Unit
		MIN	TYP	MAX	
Time to drive LP-00 to prepare for HS transmission	$T_{HS\text{-}PREPARE}$	40+4UI	-	85+6UI	ns
Time from start of t HS-TRAIL or t CLK-TRAIL period to start of LP-11 state	T_{EOT}	-	-	105+12UI	ns
Time to enable data receiver line termination measured from when Dn crosses VILMAX	$T_{HS\text{-}TERM\text{-}EN}$	-	-	35+4UI	ns
Time to drive flipped differential state after last payload data bit of a HS transmission	$T_{HS\text{-}TRAIL}$	60+4UI	-	-	ns
Time-out at RX to ignore transition period of EoT	$T_{HS\text{-}SKIP}$	40	-	55+4UI	ns
Time to drive LP-11 after HS burst	$T_{HS\text{-}EXIT}$	100	-	-	ns
Length of any Low-Power state period	T_{LPX}	50	-	-	ns
Sync sequence period	$T_{HS\text{-}SYNC}$	-	8UI	-	ns
Minimum lead HS-0 drive period before the Sync sequence	$T_{HS\text{-}ZERO}$	105+6UI	-	-	ns
Time interval during which the HS receiver should ignore any Clock Lane HS transitions, starting from the beginning of $T_{CLK\text{-}PREPAR}$	$T_{CLK\text{-}SETTLE}$	95	-	300	ns
Time interval during which the HS receiver shall ignore any Data Lane HS transitions, starting from the beginning of $T_{HS\text{-}PREPAR}$. The HS receiver shall ignore any Data Lane transitions before the minimum value, and the HS receiver shall respond to any Data Lane transitions after the maximum value.	$T_{HS\text{-}SETTLE}$	85+6UI	-	145+10UI	ns

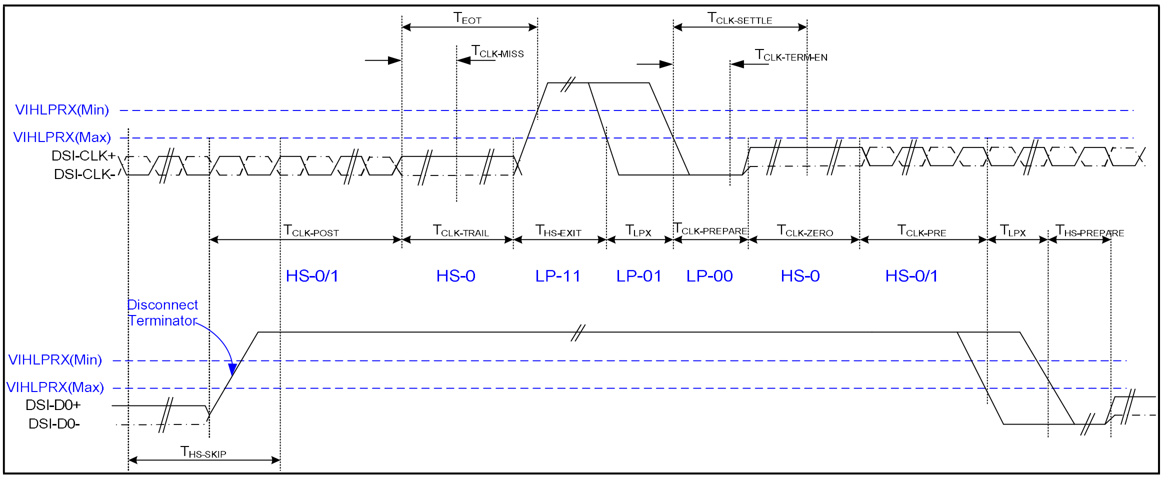


Figure 81 Switching the Clock Lane between Clock Transmission and Low-Power Mode

Parameter	Symbol	Specification			Unit
		MIN	TYP	MAX	
Time that the transmitter shall continue sending HS clock after the last associated Data Lane has transitioned to LP mode	$T_{CLK-POST}$	60+52UI	-	-	ns
Detection time that the clock has stopped toggling	$T_{CLK-MISS}$	-	-	60	ns
Time to drive LP-00 to prepare for HS clock transmission	$T_{CLK-PREPARE}$	38	-	95	ns
Minimum lead HS-0 drive period before starting Clock	$T_{CLK-PREPARE}+T_{CLK-ZERO}$	300	-	-	ns
Time to enable Clock Lane receiver line termination measured from when Dn cross VIL,MAX	$T_{HS-TERM-EN}$	-	-	38	ns
Minimum time that the HS clock must be set prior to any associated date lane beginning the transmission from LP to HS mode	$T_{CLK-PRE}$	8	-	-	UI
Time to drive HS differential state after last payload clock bit of a HS transmission burst	$T_{CLK-TRAIL}$	60	-	-	ns

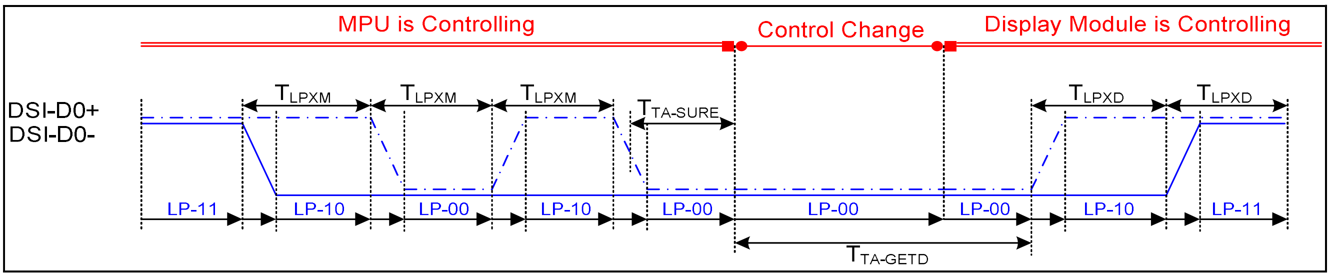


Figure 82 Bus Turn-around Procedure

Parameter	Symbol	Specification			Unit
		MIN	TYP	MAX	
Length of any Low-Power state period	T_{LPX}	50	-	-	ns
Ratio of T_{LPX} (MASTER)/ T_{LPX} (SLAVE) between Master and Slave side	Ratio T_{LPX}	2/3	-	3/2	-
Time-out before new TX side start driving	$T_{TA-SURE}$	T_{LPX}	-	2 T_{LPX}	ns
Time to drive LP-00 by new TX	T_{TA-GET}	-	5 T_{LPX}	-	ns
Time to drive LP-00 after Turnaround Request	T_{TA-GO}	-	4 T_{LPX}	-	ns

7.3.2 MIPI Interface Timing

Parameter	Symbol	Min.	Typ.	Max.	Unit
Horizontal Sync. Width	HPW	2	-	-	Byte Clock
Horizontal Sync. Back Porch	HBP	2	-	-	Byte Clock
Horizontal Sync. Front Porch	HFP	4	-	-	Byte Clock
Vertical Sync. Width	VSW	1	-	-	Line
Vertical Sync. Back Porch	VBP	2	-	-	Line
Vertical Sync. Front Porch	VFP	4	-	-	Line
Vertical Frequency	FR	-	60	-	Hz

7.3.3 Reset Timing

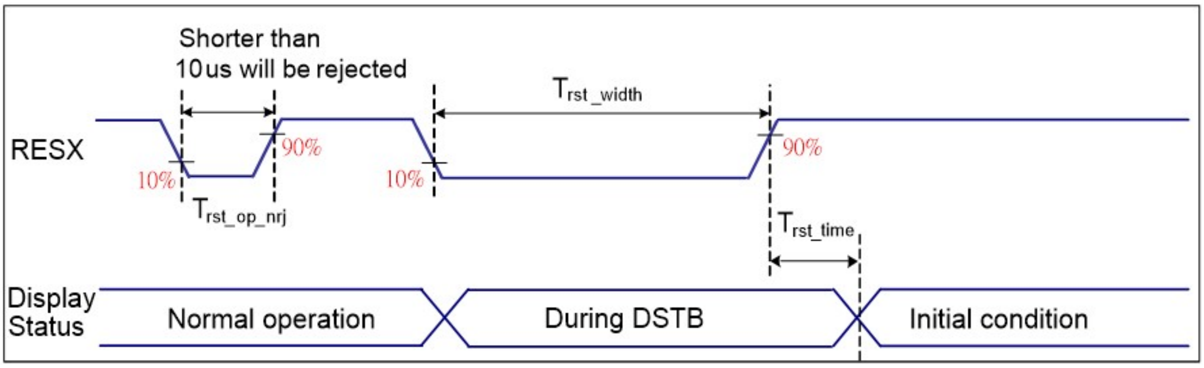


Figure 83 Reset Operation

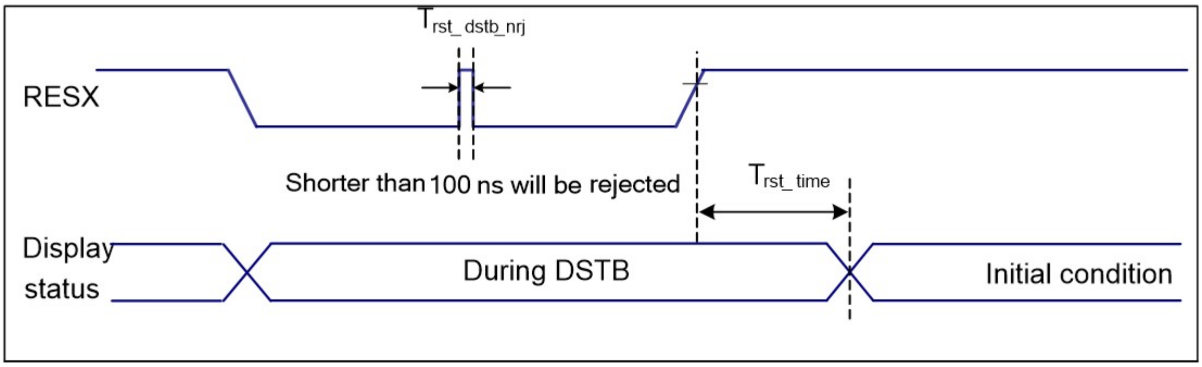


Figure 84 Reset Noise Rejected Diagram

Reset Timing Characteristics IOVCC=1.65~1.95V Ta=25℃

Parameter	Symbol	Specification			Unit
		Min.	Typ.	Max.	
Reset low width	Trst_width	1	-	-	ms
Reset time	Trst_time	2	-	-	ms
OP noise reject	Trst_op_nrj	-	-	10	us
DSTB Noise reject	Trst_dstb_nrj	-	-	100	ns

- During the reset period, the display will be blanked, then return to default condition for IC initialization

- It is necessary to wait 2ms after releasing HWRST pin before sending commands.

7.3.4 Abnormal Timing:

ST7105S provides abnormal power drop detection function, but there has a premise that external power must drop at low ramp, or the discharge function will not work. The following diagram is show how much time that external power drop from 90% to 10% is suitable.

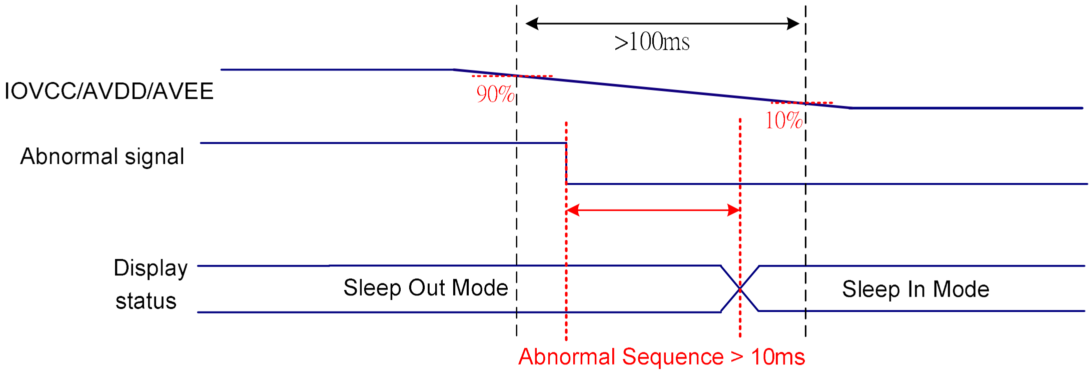


Figure 85 Reset Noise Rejected Diagram

Reset Timing Characteristics IOVCC=1.8V, AVDD=5.5V, AVEE=-5.5V Ta=25℃

External power	Power drop time from 90% to 10%			Unit
	Min.	Typ.	Max.	
IOVCC	100	-	-	ms
AVDD	100	-	-	ms
AVEE	100	-	-	ms

Note: Due to IOVCC is critical for whole chip, keep IOVCC as stable as possible.

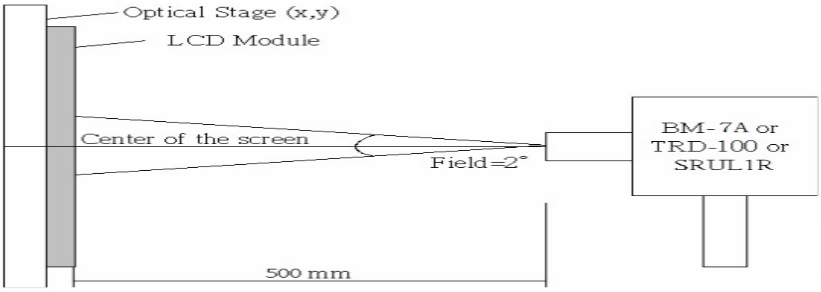
8.ELECTRO-OPTICAL CHARACTERISTICS

Item		Symbol		Condition	Min	Typ	Max	Unit	Note
Transmittance		T%		θ=0° Ta=25℃	3.6	4.2	-	%	1
Contrast ratio		Cr			600	1000	-	-	3
Response time		Ton+Toff			-	25	35	ms	4
CTP+LCM Luminance		LV			-	650	-	cd/㎡	2
Viewing angle range		H or V er	Θ_{x+}	Center CR>10	-	80	-	deg	5
			Θ_{x-}		-	80	-	deg	
			Θ_{Y+}		-	80	-	deg	
			Θ_{Y-}		-	80	-	deg	
CIE(x,y) chromaticity	Red	x		Viewing normal angle Θx=θy=0° Ta=25℃	-	-	-	-	6
		y			-	-	-	-	
	Green	x			-	-	-	-	
		y			-	-	-	-	
	Blue	x			-	-	-	-	
		y			-	-	-	-	
	White	x			-	-	-	-	
		y			-	-	-	-	

Note 1.Ambient condition：25℃±2℃，60±10%RH，under 10 Lunx in the darkroom。

Note 2.Measure device：BM-7A (TOPCON)，viewing cone=2°

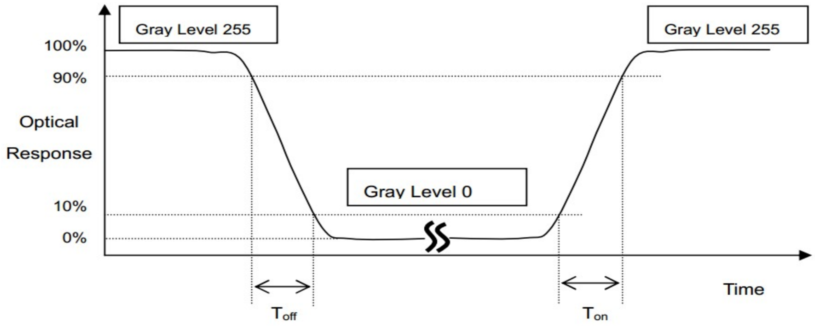
Lv = Average Surface Luminance with all white pixels (P1,P2,P3,P4,P5)



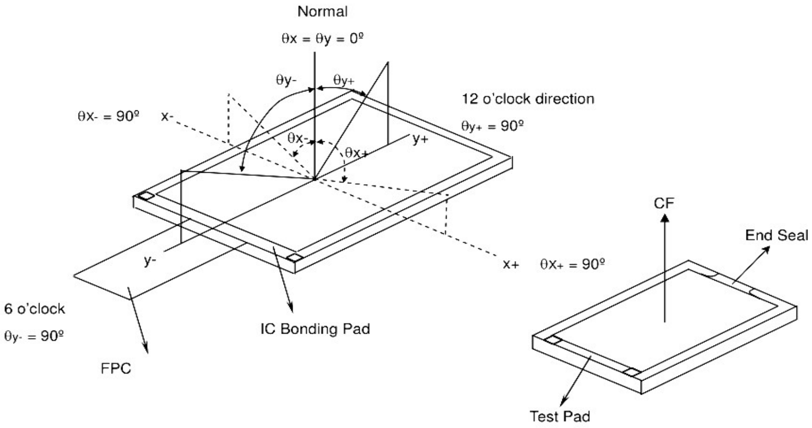
Note 3. Definition of Contrast Ratio：

$$CR = \frac{\text{Average Surface Luminance with all black pixels (P1,P2,P3,P4,P5)}}{\text{Average Surface Luminance with all white pixels (P1,P2,P3,P4,P5)}}$$

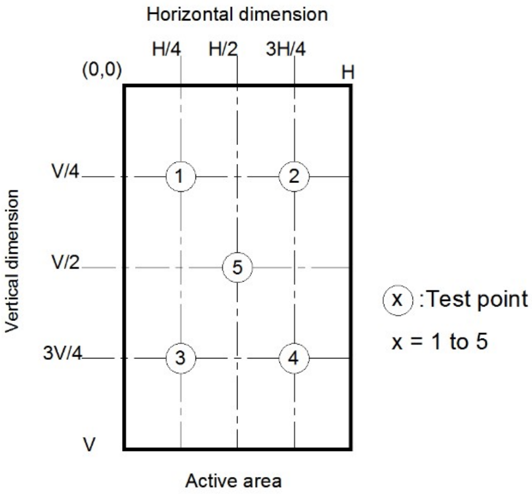
Note 4. Definition of Response Time (Ton, Toff), The response time is defined as the time interval between the 10% and 90% amplitudes.



Note 5. Definition of view angle(θ，ψ)：



Note 6. The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room. Measouring method for Contrast ratio, surface luminance, Luminance uniformity,CIE(x,y) chromaticity.



Light spot size ⌀=7mm, 500mm distance from the LCD surface to detector lens measurement instrument is TOPCON's luminance meter BM-7

9.RELIABILITY TEST

Reliability test conditions (Polarizer characteristics null)

No.	Items	Condition	Inspection after test
1	High Temperature Storage	T = 80℃±2℃ 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℃±2℃ for 48 hr	
3	High Temperature Operating	T = 70℃±2℃ for 48 hr	
4	Low Temperature Operating	T = -20℃±2℃ for 48 hr (But no condensation of dew)	
5	High Temp. and High Humidity Operating	T = 50℃±5℃ /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.

10.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 alcohol

Do 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 solvents

Wipe 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℃ ～ 40℃ 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.

11.0 Packing form-TBD

LEADTEK DISPLAY

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，

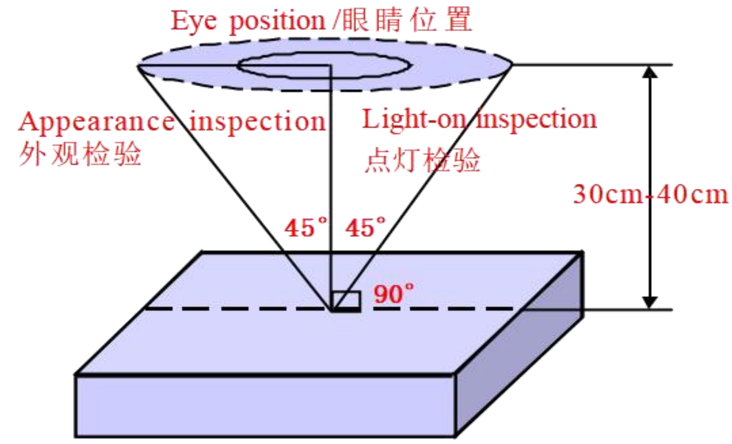
Appearance Inspection / 外观检验：8~10S.

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℃
Humidity / 湿度		55±5%RH
Brightness 亮度	Appearance Inspection / 外观检验	800~1000 Lux
	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.

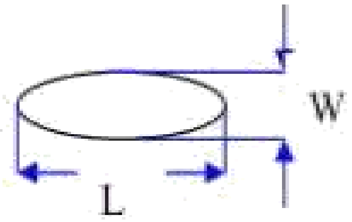
3.2、Point defects / 点状缺陷：

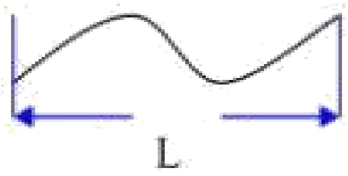
The size of a punctate defect is defined by the diameter D, and the average diameter of the defect is D=1/2(W+L) / 点状缺陷由直径 D 定义大小，缺陷的平均直径 D=1/2(W+L).

3.3、line defects / 线状缺陷：

When defect size L ≥ 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≥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:

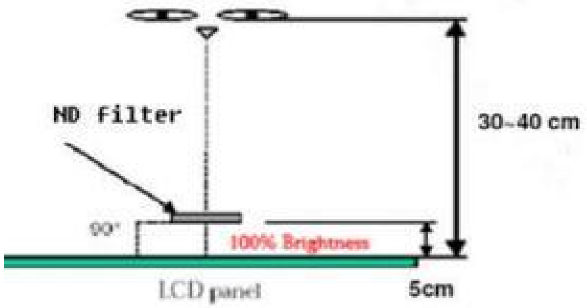
The sub-pixel defect area is greater than 50% of the LCD sub-pixel area, and is visible through ND5% masking

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 不能有开路和短路，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 / 不能溢胶和缺胶.		MI
			3、Silicone cannot cover POL and FPC/ 硅胶不能覆盖到 POL 和 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
	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	ΔE>1，Not allowable（不允许）.		MI
	Cover pinholes 针孔	Full size 全尺寸	1.D≤0.20mm , N≤2 , DS≥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	