Surenoo SLV0700B-1024600 Series LVDs Interface TFT LCD Module User Manual

Model No.: SLV0700B-1024600

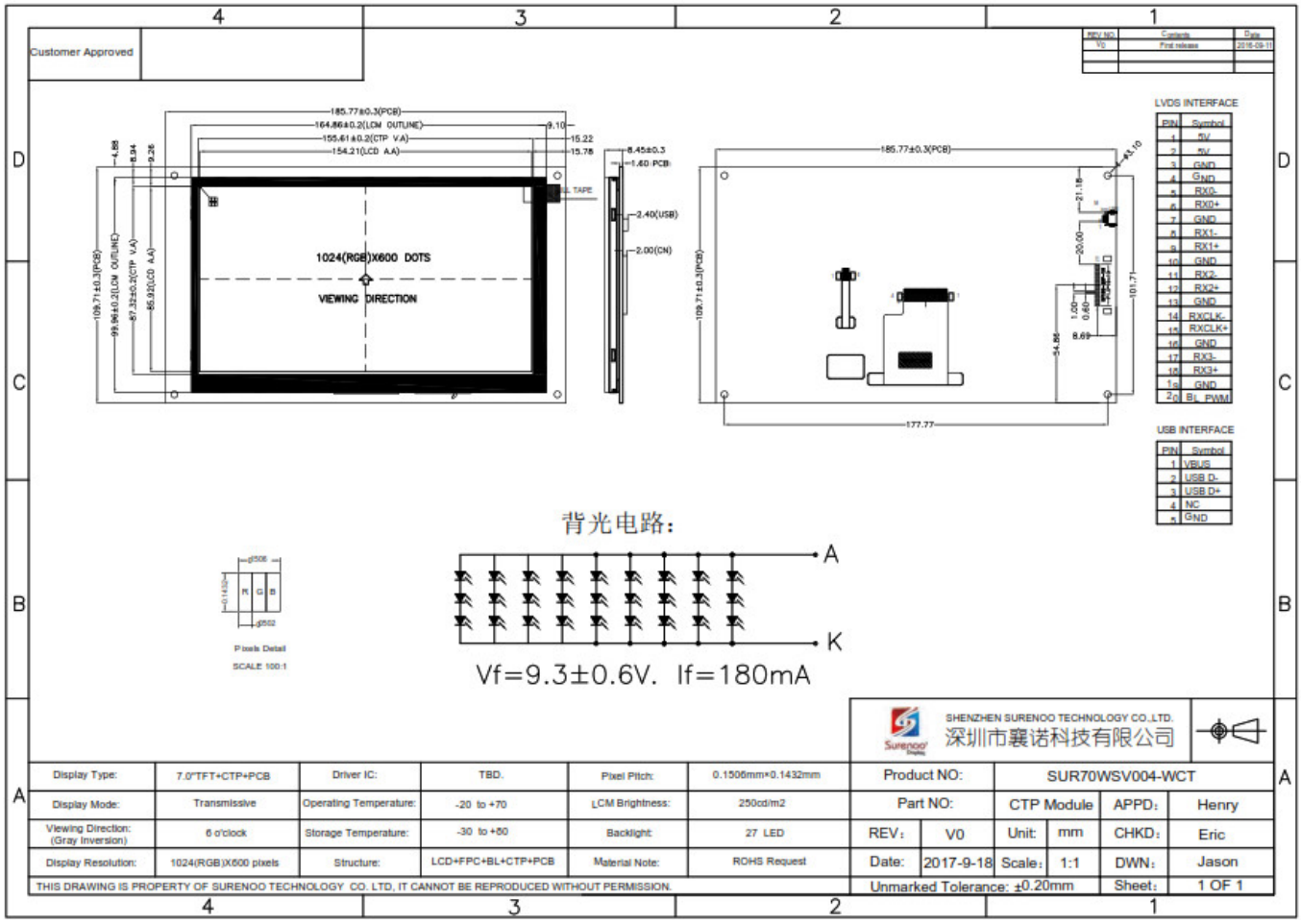
Reference Controller Datasheet
LVDS Interface LCD Module Selection Guide
FT5426

Contents

GENERAL INFORMATION

Item of general information	***Contents***		***Unit***
LCD Display Size (Diagonal)	7.0		inch
Module Structure	LCD Display + CTP Touch + PCB		–
LCD Display Type	TFT/TRANSMISSIVE		–
LCD Display Mode	Normally White		–
Recommended Viewing Direction	12		o’clock
Gray inversion Direction	6		o’clock
Module size (W×H×T)	185.77×109.71×8.45		mm
Active area (W×H)	154.21×85.92		mm
Number of pixels (Resolution)	1024RGB×600		pixel
Pixel pitch (W×H)	0.1506×0.1432		mm
Module Interface Type	LCD	LVDS interface	–
	CTP	USB interface	–
Module Input voltage	5.0V		V
Module Power consumption	–		mW
Color Numbers	16.7M		–
Backlight Type	White LED		–

EXTERNAL DIMENSIONS



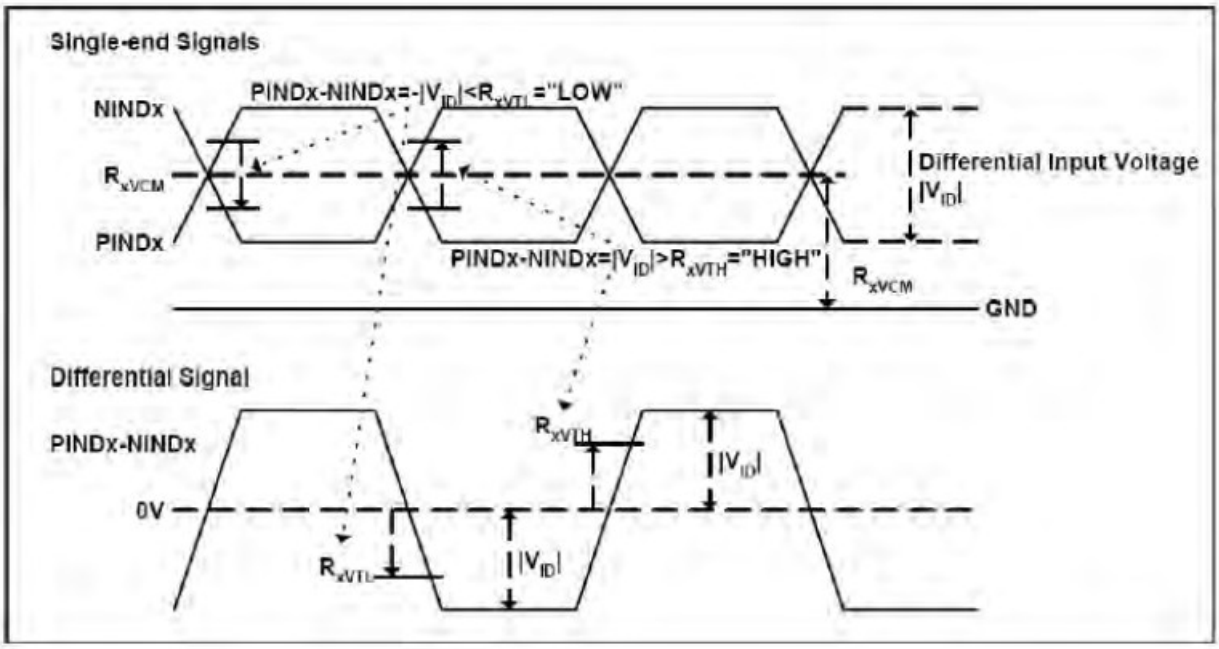
ABSOLUTE MAXIMUM RATINGS

Parameter of absolute maximum ratings	***Symbol***	***Min***	***Max***	***Unit***
Operating temperature	Top	-20	70	℃
Storage temperature	Tst	-30	80	℃
Humidity	RH	–	90%(Max 60℃)	RH

Note: Absolute maximum ratings means the product can withstand short-term, not more than 120 hours. If the product is a long time to withstand these conditions, the life time would be shorter.

ELECTRICAL CHARACTERISTICS(DC CHARACTERISTICS)

Parameter of DC characteristics	***Symbol***	***Min.***	***Typ.***	***Max.***	***Unit***
LVDS Differential input high threshold voltage	RX VTH	–	–	+0.1	V
LVDS Differential input low threshold voltage	RX VTL	-0.1	–	–	V
LVDS Differential input common mode voltage	RX VCM	VID / 2		2.4 – VID / 2	V
LVDS Differential input voltage	VID	0.2	–	0.6	V

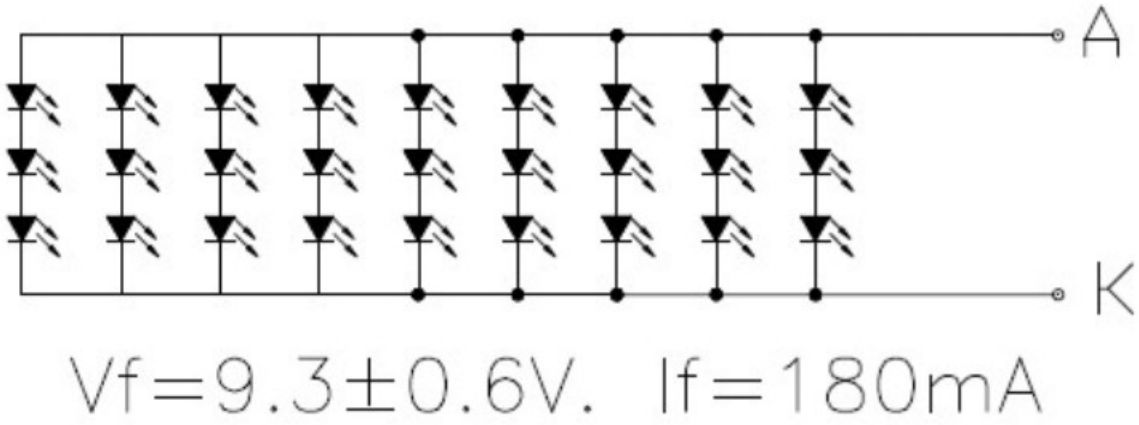


BACKLIGHT CHARACTERISTICS

Item of backlight characteristics	***Symbol***	***Min.***	***Typ.***	***Max.***	***Unit***	***Remark***
Forward Voltage	Vf	8.7	9.3	9.9	V	Note1
Forward Current	If	–	180	–	mA	–
Number of LED	–	–	3*9=27	–	Piece	–
LED Connection mode	P/S	–	Serial/Parallel	–	–	–
Lifetime of LED	–	–	10000	–	hour	Note2

Note:

- Note1: The LED Supply Voltage is defined by the number of LED at Ta=25℃ and If=180mA.
- Note2: The LED lifetime define as the estimated time to 80% degradation of initial luminous. The LED lifetime could be decreased if operating If is larger than 180mA.
- Backlight control via the BL_PWM pin.
- Backlight circuit:



CTP CHARACTERISTICS

Item of CTP characteristics	***Specification***	***Unit***	***Remark***
Panel Type	Glass Cover + Glass Sensor	–	–
Resolution	1024 × 600	pixel	–
Surface Hardness	≥6H	–	–
Transparency	82%	–	–
Driver IC	–	–	–
Interface Type	USB	–	–
Support Points	5	–	–
Sampling Rate	20~100	Hz	–
Supply voltage	3.3	V	–

ELECTRO-OPTICAL CHARACTERISTICS

Item of electro-optical characteristics		*Symbol*	*Condition*	*Min.*	*Typ.*	*Max.*	*Unit*	*Remark*	*Note*
Response time		Tr+Tf	θ=0 =0 Ta=25°C	–	25	50	ms	FIG 1.	4
Contrast Ratio		CR		–	400	–	–	FIG 2.	1
Luminance uniformity		WHITE		–	80	–	%	FIG 2.	3
Surface Luminance		Lv		–	250	–	cd/m2	FIG 2.	2
CIE (x, y) chromaticity	White	White x	θ=0 =0 Ta=25°C	–	0.31	–	–	FIG 2.	5
		White y		–	0.33	–			
Viewing angle range	=90(12 o'clock)		CR 10	–	70	–	deg	FIG 3.	6
	=270(6 o'clock)			–	75	–	deg		
	=0(3 o'clock)			–	75	–	deg		
	=180(9 o'clock)			–	75	–	deg		
NTSC ratio	–		–	–	50	–	%	–	–

Note 1. Contrast Ratio(CR) is defined mathematically by the following formula. For more information see FIG 2.:

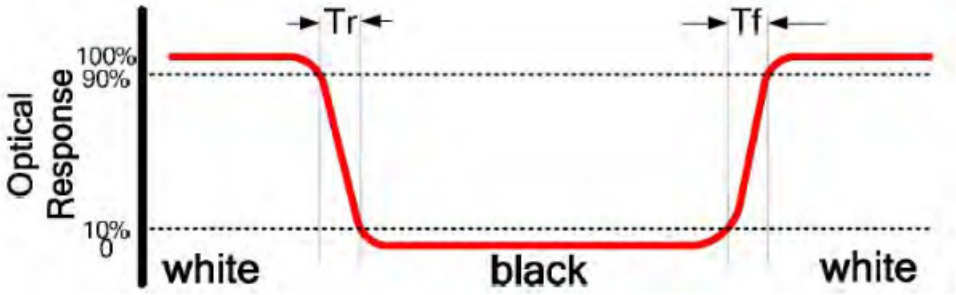
$$\text{Contrast Ratio(CR)} = \frac{\text{Average Surface Luminance with all white pixels(P1,P2,P3,P4,P5,P6,P7,P8,P9)}}{\text{Average Surface Luminance with all black pixels(P1,P2,P3,P4,P5,P6,P7,P8,P9)}}$$

Note 2. Surface luminance is the LCD surface from the surface with all pixels displaying white. For more information see FIG 2.
Lv=Average Surface Luminance with all white pixels (P1,P2,P3,P4,P5,P6,P7,P8,P9)
Note 3. The uniformity in surface luminance WHITE is determined by measuring luminance at each test position 1 through 9, and then dividing the maximum luminance of 9points luminance by minimum luminance of 9 points luminance. For more information see FIG 2.

$$\delta\text{WHITE} = \frac{Minimum\ Surface\ Luminance\ with\ all\ white\ pixels\ (P1,P2,P3,P4,P5,P6,P7,P8,P9)}{Maximum\ Surface\ Luminance\ with\ all\ white\ pixels\ (P1,P2,P3,P4,P5,P6,P7,P8,P9)}$$

Note 4. Response time is the time required for the display to transition from White to black(Rise Time, Tr) and from black to white(Decay Time, Tf). For additional information see FIG 1.
Note 5. CIE (x, y) chromaticity ,The x,y value is determined by screen active area position 5.
For more information see FIG 2.
Note 6. Viewing angle is the angle at which the contrast ratio is greater than a specific value.
For TFT module, the specific value of contrast ratio is 10.The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface. For more information see FIG 3.
Note 7. For Viewing angle and response time testing, the testing data is base on Autronic-Melchers's ConoScope.

Series Instruments. For contrast ratio, Surface Luminance, Luminance uniformity and CIE the testing data is base on BM-7 photo detector.
Note 8. For TN type TFT transmissive module, Gray scale reverse occurs in the direction of panel viewing angle.
FIG.1. The definition of Response Time



CIE (x , y) chromaticity
A : H/6 ;
B : V/6 ;
H,V : Active Area(AA) size
Measurement instrument: BM-7; Light spot size=5mm, 350mm distance from the LCD surface to detector lens.

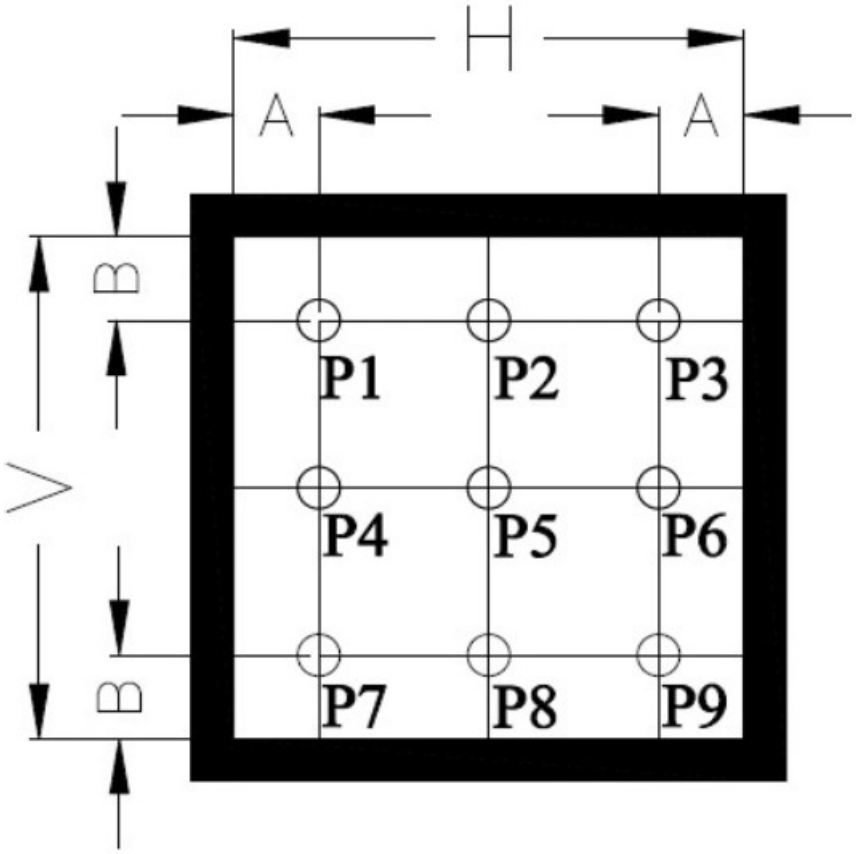
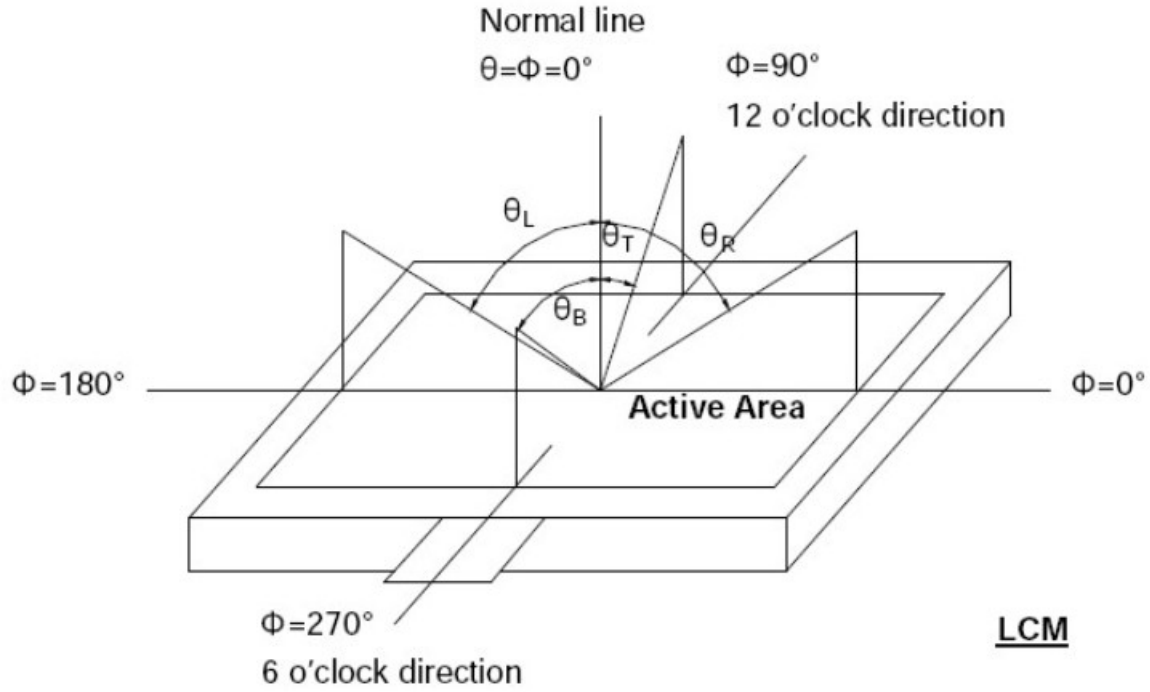


FIG.3. The definition of viewing angle



INTERFACE DESCRIPTION

Connector: DF19G-20P-1H

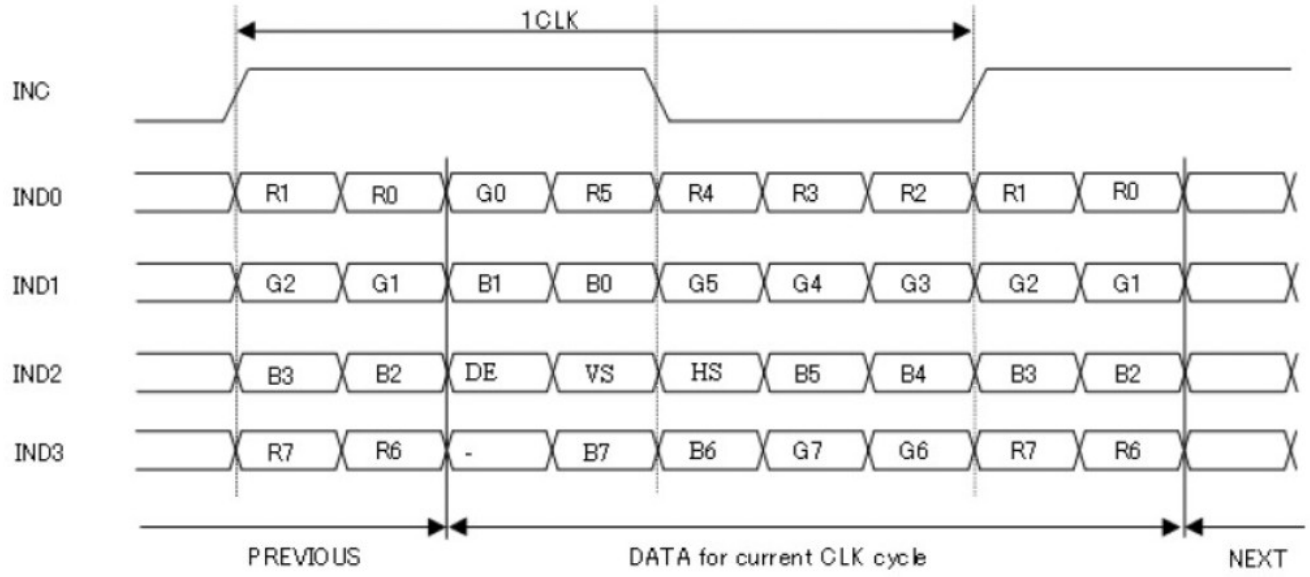
NO.	*Symbol*	*I/O*	*DESCRIPTION*	*Remark*
1~2	5V	P	Module Power supply (5V Typ.)	
3~4	GND	P	Ground	
5	RX0-	I	-LVDS Differential Data Input	R0~R5,G0
6	RX0+	I	+LVDS Differential Data Input	
7	GND	P	Ground	
8	RX1-	I	-LVDS Differential Data Input	G1~G5,B0,B1
9	RX1+	I	+LVDS Differential Data Input	
10	GND	P	Ground	
11	RX2-	I	-LVDS Differential Data Input	B2~B5,HS,VS,DE
12	RX2+	I	+LVDS Differential Data Input	
13	GND	P	Ground	
14	RXCLK-	I	-LVDS Differential Clock Input	LVDS CLK
15	RXCLK+	I	+LVDS Differential Clock Input	
16	GND	P	Ground	
17	RX3-	I	-LVDS Differential Data Input	R6,R7,G6,G7,B6,B7
18	RX3+	I	+LVDS Differential Data Input	
19	GND	P	Ground	
20	BL_PWM	I	Backlight control signal	

INPUT TIMING

HV mode input Timing table

Parameter	*Symbol*	*Value*			*Unit*
		Min.	*Typ.*	*Max.*	
DCLK frequency@ Frame rate=60Hz	DCLK	44.9	51.2	63	MHz
Horizontal display area	thd	1024			DCLK
1 Horizontal Line	th	1200	1344	1400	DCLK
HSYNC pulse width	thpw	1	–	140	DCLK
HSYNC Blanking	thb	160	160	160	DCLK
HSYNC Front Porch	thfp	16	160	216	DCLK
Vertical display area	tvd	600			H
VSYNC period time	tv	624	635	750	H
VSYNC pulse width	tvpw	1	–	20	H
VSYNC Blanking	tvb	23	23	23	H
VSYNC Front Porch	tvfp	1	12	127	H

LVDS Data Input Format



RELIABILITY TEST CONDITIONS

No.	*Test Item*	*Test Condition*
1	High Temperature Storage	80℃/120 hours
2	Low Temperature Storage	-30℃/120 hours
3	High Temperature Operating	70℃/120 hours
4	Low Temperature Operating	-20℃/120 hours
5	Temperature Cycle Storage	-20℃(30min.)~25(5min.)~70℃(30min.)×10cycles

A Inspection after test:

Inspection after 2~4 hours storage at room temperature, the sample shall be free from defects:

Ø Air bubble in the LCD;

Ø Sealleak;

Ø Non-display;

Ø Missing segments;

Ø Glass crack;

Ø Current is twice higher than initial value.

B Remark:

Ø The test samples should be applied to only one test item.

Ø Sample size for each test item is 5~10pcs.

Ø Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

INSPECTION CRITERION

This specification is made to be used as the standard of acceptance/rejection criteria for TFT-LCD/IPS TFT-LCD module product, and this specification is applicable only in the case that the size of module equal to or exceed than 3.5 inch.

11.1 Sample plan

Sampling plan according to GB/T2828.1-2003/ISO 2859-1 1999 and ANSI/ASQC Z1.4-1993,normal level 2 and based on:

Major defect: AQL 0.65

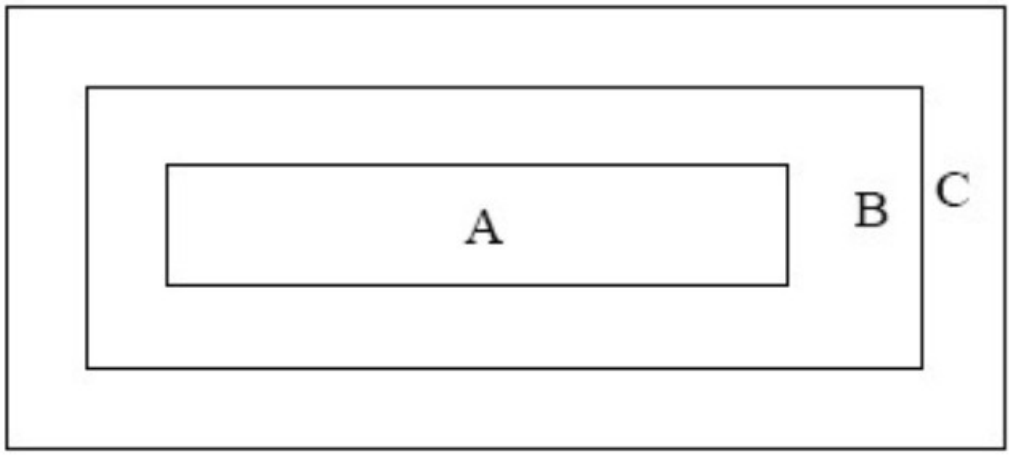
Minor defect: AQL 1.5

11.2 Inspection condition

Viewing distance for cosmetic inspection is about 30cm with bare eyes, and under an environment of 20~40W light intensity, all directions for inspecting the sample should be within 45°against perpendicular line. (Normal temperature 20~25°Cand normal humidity 60 ±15%RH)

11.3 Definition of Inspection Item.

A Definition of inspection zone in LCD.

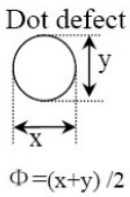


Zone A: character/Digit area
Zone B: viewing area except Zone A (Zone A + Zone B=minimum Viewing area)
Zone C: Outside viewing area (invisible area after assembly in customer's product)
Fig.1 Inspection zones in an LCD
Note: As a general rule, visual defects in Zone C are permissible, when it is no trouble for quality and assembly of customer's product.
B Definition of some visual defect

Bright dot	Because of losing all or part function, bad pixel dots appear bright and the size is more than 50% of one dot in which LCD panel is displaying under black pattern.
Dark dot	Dots appear dark and unchanged in size in which LCD panel is displaying under pure red, green, blue picture, or pure whiter picture.

Item No.	***Items to be inspected***	***Inspection standard***	***Classification of defects***
1	Functional defects	1) No display 2) Display abnormally 3) Missing vertical, horizontal segment 4) Short circuit 5) Excess power consumption 6)Backlight no lighting, flickering and abnormal lighting	major
2	Missing	Missing component	
3	Outline dimension	Overall outline dimension beyond the drawing is not allowed	

11.5 Minor Defect

<table>
<tr><th>Item No.</th><th>Items to be inspected</th><th colspan="5">Inspection standard</th><th>Classification of defects</th></tr>
<tr><td rowspan="8">1</td><td rowspan="8">Bright dot
 

/dark dot defect</td><td rowspan="2">Zone</td><td colspan="3">Acceptable Qty</td><td rowspan="2"></td><td rowspan="8">Minor</td></tr>
<tr><td colspan="3">A+B</td></tr>
<tr><td>3.5 7”</td><td>7 10.1”</td><td>10.1”</td><td>C</td></tr>
<tr><td>Bright pixel dot</td><td>1</td><td>2</td><td>3</td><td rowspan="5">Acceptable</td></tr>
<tr><td>Dark pixel dot</td><td>4</td><td>4</td><td>4</td></tr>
<tr><td>2bright dots adjacent</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>2dark dots adjacent</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>Total bright and dark dots</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td colspan="6">Note: Minimum distance between defective dots is more than 5mm; Pixel dots’ function is normal, but bright dots caused by foreign material and other reasons are judged by the dot defect of 5.2.</td></tr>
</table>

<table>
<tr><td>2</td><td></td><td>
<table>
<tr><td>Zone

Size(mm)</td><td colspan="3">Acceptable Qty</td></tr>
<tr><td></td><td colspan="2">A+B</td><td rowspan="2">C</td></tr>
<tr><td></td><td>3.5” 7”</td><td>7 10.1”</td><td>10.1”</td></tr>
<tr><td>Φ≤0.2</td><td>Acceptable</td><td>Acceptable</td><td>Acceptable</td><td rowspan="3">Acceptable</td></tr>
<tr><td>0.2 Φ≤0.5</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>Φ 0.5</td><td>0</td><td>0</td><td>0</td></tr>
</table>
Note:
1. Minimum distance between defective dots is more than 5 mm;
2. The quantity of defect is zero in operating condition.
</td><td>Minor</td></tr>
<tr><td>3</td><td>Linear defect</td><td></td><td>Minor</td></tr>
</table>

<table>
<tr>
<td>4</td>
<td>Polarizer defect</td>
<td>
5.4.1 Polarizer Position

(i) Shifting in position should not exceed the glass outline dimension.

(ii) Incomplete covering of the viewing area due to shifting is not allowed.

5.4.2 Dirt on polarizer

Dirt which can be wiped easily should be acceptable.

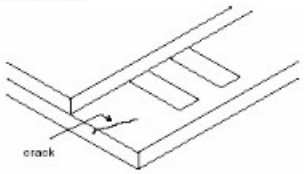
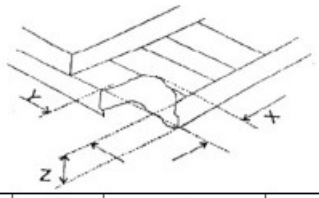
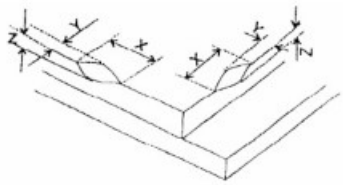
5.4.3 Polarizer Dent & Air bubble

5.4.4 Polarizer scratch

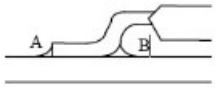
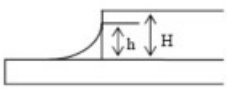
(i) If the polarizer scratch can be seen after cover assembling or in the operating condition, judge by the linear defect of 5.3. (ii)If the polarizer scratch can be seen only in non-operating condition or some special angle, judge by the following:
<table>
<tr><td>Zone

Size (mm)</td><td></td><td>Acceptable Qty</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>A+B</td><td></td><td></td><td>C</td></tr>
<tr><td>Length</td><td>Width</td><td>3.5” 7”</td><td>7 10.1”</td><td>10.1”</td><td></td></tr>
<tr><td>Ignore</td><td>W≤0.05</td><td>Acceptable</td><td>Acceptable</td><td>Acceptable</td><td rowspan="3">Acceptable</td></tr>
<tr><td>1.0 L ≤5.0</td><td>0.05 W≤0.20</td><td>4</td><td>5</td><td>6</td></tr>
<tr><td>L 5.0</td><td>W 0.2</td><td>0</td><td>0</td><td>0</td></tr>
</table>
</td>
<td>Minor</td>
</tr>
<tr>
<td></td>
<td>MURA</td>
<td>Using 3% ND filter, it’s NG if it can be seen in R,G,B picture.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</table>

5	White/Black dot MURA	Visible under ND3% D≦0.15mm, Acceptable 0.15mm<D≦0.5mm, N≦4 D>0.5mm, Not allowable.	Minor

6	Glass defect	*(i) Crack* *Cracks are not allowed.*  	*Minor*
		(ii) TFT chips on corner  X / Y / Z / Acceptable ≤3.0 / ≤3.0 / Not more than the thickness of glass / N≤3 *Chips on the corner of terminal shall not be allowed to extend into the ITO pad or expose perimeter seal.*	*Minor*
		(iii) Usual surface crack  X / Y / Z / Acceptable ≤1.5 / ≤1.5 / Not more than the thickness of glass / N≤4 *It is only applicable to the upper glass of LCD.*	*Minor*

Item No.	***Items to be inspected***	***Inspection Standard***	***Classification of defects***
1	Difference in Spec.	Not allowable	Major
2	Pattern peeling	No substrate pattern peeling and floating	Major
3	Soldering defects	No soldering missing	Major
		No soldering bridge	Major
		No cold soldering	Minor
4	Resist flaw on PCB	Visible copper foil (Φ0.5 mm or more) on substrate pattern is not allowed	Minor
5	FPC gold finger	No dirt, breaking, oxidation lead to black	Major

6	Backlight plastic fram e	No deformation, crack, breaking, backlight positioning col umn breaking, obvious nick.	Minor
7	Marking printing effect	No dark marking, incomplete, deformation lead to unable to judge	Minor
8	Accretion of metallic Foreign matter	No accretion of metallic foreign matter (Not exceed Φ0.2 mm)	Minor
9	Stain	No stain to spoil cosmetic badly	Minor
10	Plate discoloring	No plate fading, rusting and discoloring	Minor
11	1. Lead parts	a. Soldering side of PCB Solder to form a 'Filet' all around the lead. Solder should not hide the lead form perfectly.	Minor
		b. Components side(In case of 'Through Hole PCB') Sold er to reach the Components side of PCB.	Minor
	2. Flat packages	Either 'Toe'(A) or 'Seal'(B)of the lead to be covered by "Fil et". Lead form to be assume over Solder.	Minor
	3. Chips	(3/2) H ≥h ≥(1/2) H	Minor
	4. Solder ball/Solder s plash	a. The spacing between solder ball and the conductor or solder pad h ≥0.13 mm. The diameter of solder ball d≤0.1 5 mm.	Minor
		b. The quantity of solder balls or solder splashes isn't bey  ond 5 in 600 mm2.	Minor
		c. Solder balls/Solder splashes do not violate minimum el ectrical clearance.  	Major

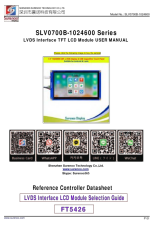
Business Card

http://www.surenoo.com

WhatsAPP	카카오톡
https://wa.me/qr/4GGOIDYZ2PXXN1	http://qr.kakao.com/talk/THom9tzJN5OMzvx1vTL1V.LvnEc-
LINE（ライン）	WeChat
https://line.me/ti/p/oas8BmVLVd	https://u.wechat.com/EAK0B_I2YfPLwx3tRqiKkf4

Shenzhen Surenoo Technology Co.,Ltd. www.surenoo.com
Skype: Surenoo365

Documents / Resources

	Surenoo SLV0700B-1024600 Series LVDs Interface TFT LCD Module [pdf] User Manual SLV0700BA3-1024600, SLV0700B-1024600 Series, SLV0700B-1024600 Series LVDs Interface TFT LCD Module, SLV0700B-1024600 Series Interface TFT LCD Module, LVDs Interface TFT LCD Module, Interface TFT LCD Module, LVDs TFT LCD Module, TFT LCD Module, TFT Module, LCD Module, Module

References

- Surenoo Tech: Professional LCD Module Supplier Since 2005