ALL SHORE INDUSTRIES

ASI-T-3009B2SRN/AW

Item	General feature	Remark
MODELE SIZE	3.0"	"
LCD Type	TFT TRANSMISSIVE	/
Viewing Direction	6	O'Clock
Outside dimensions(W*H*T)	43.44*75.31*3.75	mm^3
Active Area(W*H)	36.84*65.52	mm^2
Number of Pixels	960*240	/
Driver IC IC	ILI8961	/
Colors	262K	/
Interface Type	SPI+8-Bit RGB Interface	/
Input Voltage	3.3	V

CONTENTS

1.GENERAL INFORMATION

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2. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage for Logic	Vdd	-0.3	3.6	V
Input Voltage	Vin	-0.3	Vdd+0.3	V
Operating Temperature	Top	-10	60	C
Storage Temperature	Tst	-20	70	C
Humidity	RH	/	90%(Max60℃)	RH

3. ELECTRICAL CHARACTERISTICS

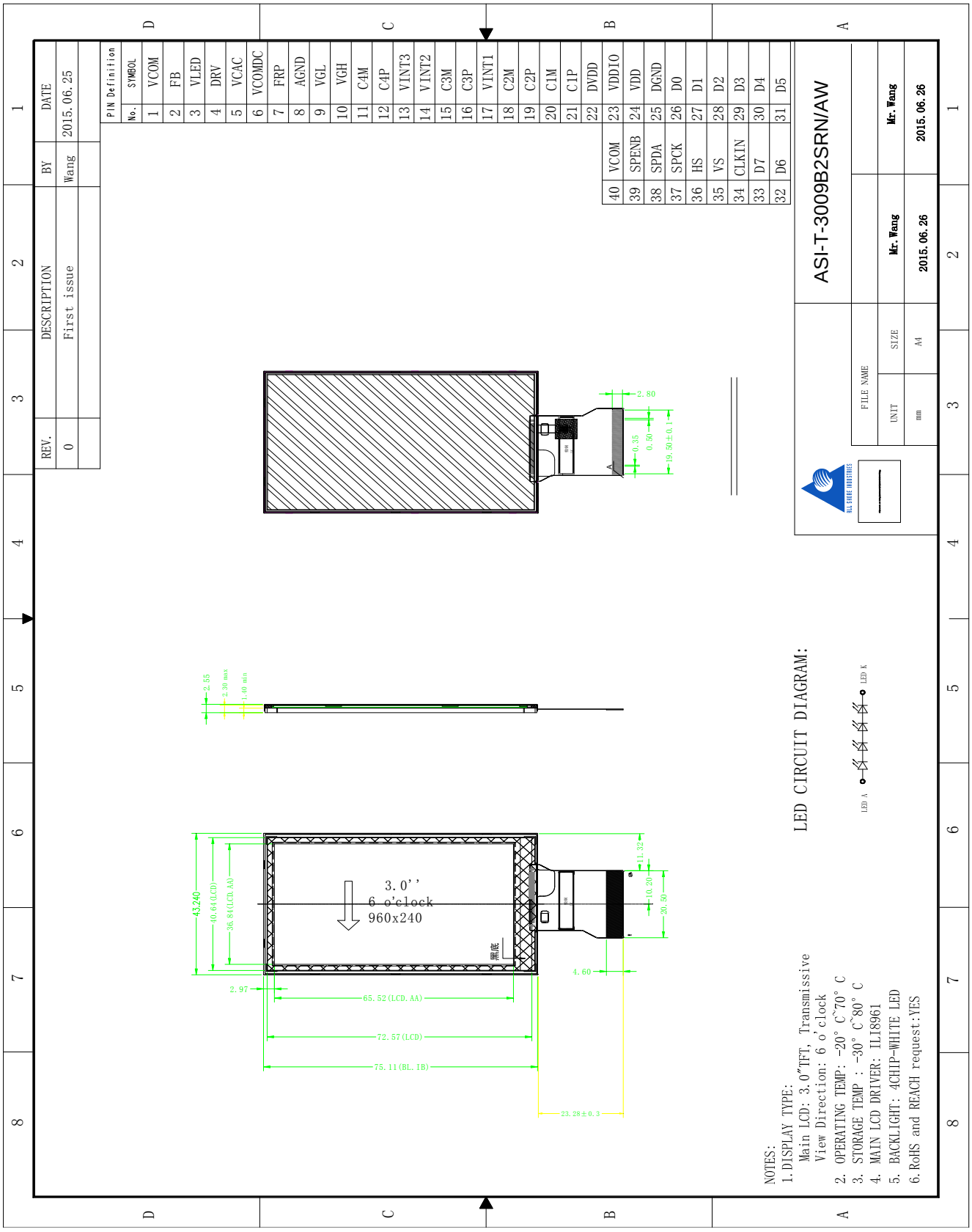
3.1 DC Characteristics

Parameter	Symbol	Min	Type	Max	Unit
Supply Voltage for Logic	Vdd-Vss	2.7	3.3	3.6	V
Input Current	Idd	/	TBD	TBD	mA
Input Voltage H Level	Vih	0.8IOVCC	-	IOVCC	V
Input Voltage L Level	Vil	-0.3	-	0.2 IOVCC	V
Output Voltage H Level	Voh	0.8 IOVCC	-	IOVCC	V
Output Voltage L Level	Vol	-	-	0.2 IOVCC	V

3.2 Backlight Characteristics

Item	Symbol	Min	Type	Max	Unit	Condition
Forward voltage	Vf	12.0	12.8	13.6	V	If= 20mA/LED
Luminance	Lv	230	/	/	cd/m^2	
Number of LED	/	4			Piece	/
Connection mode	S	Series			/	/
(Uniformity)	Avg	80	/	/	%	If= 20mA/LED

4. LCM Structure chart



REV.	DESCRIPTION	BY	DATE
0	First issue	Wang	2015.06.25

P/N Definition No.	SYMBOL
1	VCOM
2	FB
3	VLED
4	DRV
5	VCAC
6	VCOMDC
7	FRP
8	AGND
9	VGL
10	VGH
11	C4M
12	C4P
13	VINT3
14	VINT2
15	C3M
16	C3P
17	VINT1
18	C2M
19	C2P
20	C1M
21	C1P
22	DVDD
23	VDDIO
24	VDD
25	DGND
26	D0
27	D1
28	D2
29	D3
30	D4
31	D5
32	D6
33	D7
34	CLKIN
35	VS
36	HS
37	SPCK
38	SPDA
39	SPENB
40	VCOM

5.Interface Description

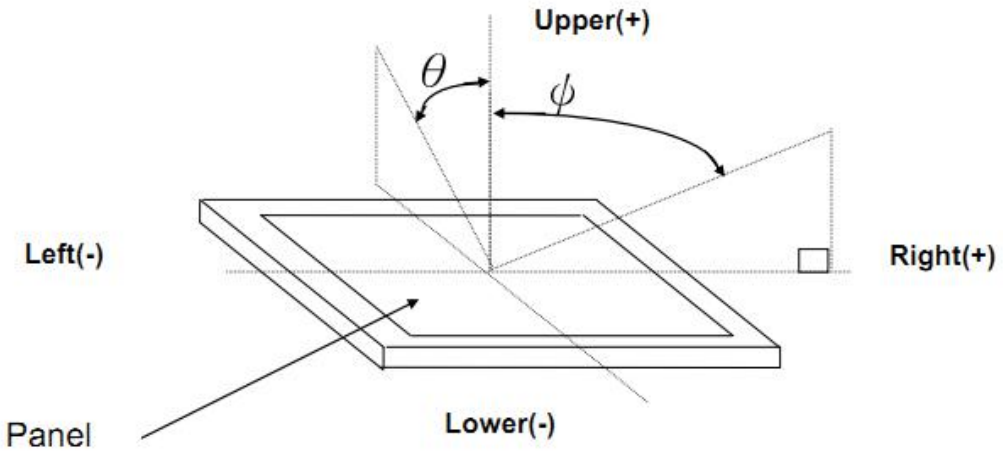
No.	SYMBOL	I/O	Description
1	VCOM		*Common electrode driving voltage*
2	FB		*LED power cathode*
3	VLED		*LED power anode*
4	DRV		*Power transistor signal for back light power boost converter.*
5	VCAC		*Power setting capacitor for VCOM AC.*
6	VCOMDC		*VCOM DC voltage output pin*
7	FRP		*Frame polarity output for panel VCOM.*
8	AGND		*Ground pin for analog circuits.*
9	VGL		*Power setting capacitor connect pin*
10	VGH		*Power setting capacitor connect pin*
11	C4M		*Capacitor connect pin for internal charge pump.*
12	C4P		*Capacitor connect pin for internal charge pump.*
13	VINT3		*Power setting capacitor connect pin.*
14	VINT2		*Power setting capacitor connect pin.*
15	C3M		*Capacitor connect pin for internal charge pump.*
16	C3P		*Capacitor connect pin for internal charge pump.*
17	VINT1		*Power setting capacitor connect pin.*
18	C2M		*Capacitor connect pin for internal charge pump.*
19	C2P		*Capacitor connect pin for internal charge pump.*
20	C1M		*Capacitor connect pin for internal charge pump.*
21	C1P		*Capacitor connect pin for internal charge pump.*
22	DVDD		*Power setting capacitor connecting pins.*
23	VDDIO		*Power supply for digital interface*
24	VDD		*Power setting*
25	DGND		*Ground for digital circuits.*
26~33	D0~D7		*Data bus*
34	*CLKIN*		*Data clock input*
35	VS		*Vertical sync input*
36	HS		*Horizontal sync input*
37	SPCK		*Serial command clock input*
38	SPDA		*Serial command data input*
39	SPENB		*Serial communication chip select*
40	VCOM		*Common electrode driving voltage*

6. Optical Specification

Items		Symbol	Condition	Specifications			nit	Note
Transmittance		T%	Viewing Angle x= y=0	4.5				
Contrast Rati		CR		800				
Response Time		Ton+Toff		30			s	
---				Min	Typ	Max		
Chromaticity	Red	XR	Viewing Angle x= y=0		0.			
		Y_R			0.322		-	
	Green	X_G			0.290		-	
		Y_R			0.588		-	
	Blue	X_B			0.134		-	
		Y_B			0.124		-	
	White	X_W			0.298		-	
		Y_W			0.328		-	

(Using CPT LC+ EWV Polarizer+Corresponding Backlight, reference only)

ITEM		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
Transmittance		T			5.6		%	
Contrast Ratio		CR		---	400	---		Note 3
Response Time		Tr+Tf	θ =ψ= 0°	---	30	---	ms	Note 4
Viewing angle		CR≧10	U	55	65		degree	Note 5
			D	40	50		degree	Note 5
			L	50	60		degree	Note 5
			R	50	60		degree	Note 5
Color Filter Chromacicity	W	x	θ =ψ= 0°	0.287	0.297	0.307		Note 6
		y		0.325	0.335	0.345		
		Y		31.1	34.1	37.1		
	R	x		0.589	0.599	0.609		
		y		0.307	0.317	0.327		
		Y		19.1	22.1	25.1		
	G	x		0.271	0.281	0.291		
		y		0.535	0.545	0.555		
		Y		56.2	60.2	64.2		
	B	x		0.134	0.144	0.154		
		y		0.150	0.160	0.170		
		Y		17.0	20.0	23.0		
	NTSC				48.7		%	



Definition of Viewing Angle

Response time is the time required for the display to transition from white to black (Rising time, Tr) and from black to white (Falling time, Tf).for additional information

(3)Contrast Ratio(CR) 对比度

Contrast Ratio(CR) is defined mathematically as: CR 公式定义

$$\text{Contrast Ratio} = \frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$$

对比度（CR）= L 亮/ L 暗

Surface luminance is the center point across the lcd surface 500mm from the surface with all pixels displaying white.

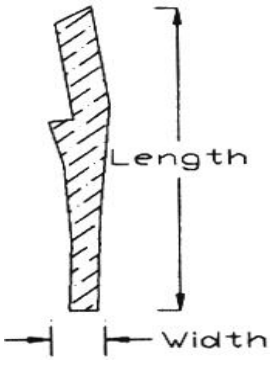
7.LCM Inspection standard

7.1 Special examination requirements:

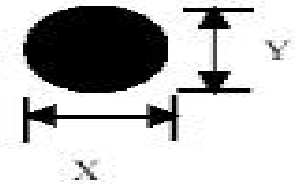
Examination Items:	Acceptable Standard:	Remarks:
Backlight	1. Backlight installed 2. Brightness, uniformity and efficiency must be in specs requested. 3. Backlight colors must be in specs requested	Visual Examination With Magnifier
Bezzel	To reject visible damages, shape changes or solder chips.	
FPC	1. Bent track angle cannot be bigger than 90°C as shown 2. To reject cracks or breaks on enforced panel, or bubbles taking more than 20% of whole section 3. To reject scratches or dirt spots or small objects on connection pins 4. To reject oxygenized or defects on connection pins 5. To reject any connection pins missing or incomplete electroplated layers	

7.2 TFT examination standard:

Examination Items:	Accesseble standard		Remarks:
1. Line Shape Defects(lines in black or white)	length (mm)	wide (mm)	Accesseble QTY
	----	W ≤ 0.05	access
	L ≤ 5	0.05 < W ≤ 0.1	1
2. Scraching	length (mm)	wide (mm)	Accesseble QTY
	----	W ≤ 0.05	access
	L ≤ 5	0.05 < W ≤ 0.1	1

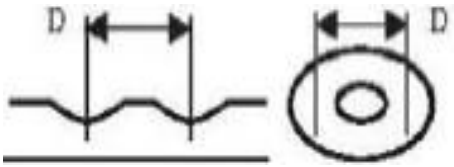


3. Dot Shape Defectives	size(mm)	Accesseble QTY
	D≤0.10	access
	0.10<D≤0.20	2
	0.2<D≤0.25	1
	D>0.25	0



D= (long length X+short length Y)/2

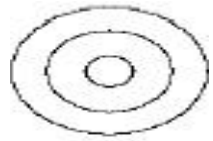
4. TP:	size(mm)	Accesseble QTY
Dimples or Bubbles	D≤0.20	access
	0.20<D≤0.30	6
	0.3<D≤0.5	2
	D>0.5	0



5. Neton's Rings Exam.

A Even & equal Newton's rings(as drawing A)

1. If the size of Newton's rings is more than 25% of T/P area, it is rejected.
2. Under fluorescent light, if the size of Newton's rings is no more than 25% and also do not change display images, it is acceptable.

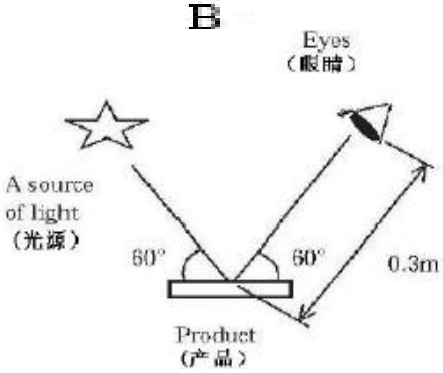


A

B Uneven & unequal Newton's rings (as drawing B)

1. Under no fluorescent light, if the size of Newton's rings is bigger than 7mm, it is rejected.
2. Under fluorescent light, as long as the display characters or images are changed, no matter how big the size of Newton's rings, it is rejected.

B



Remarks: please remove the protect film when it is tested.

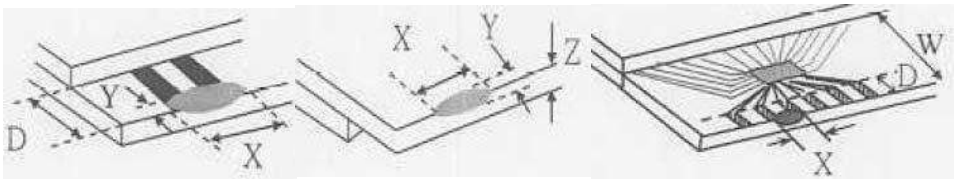
6. Surface Defect

Z	X	Y
Z≤1/2t	X≤a	
Z≤1/2t	X≤a	

7. Corner Defect

Z	X	Y
Z≤1/2t	X≤1/8a	
Z≤1/2t	X≤1/8a	

8 Contact Pads Defects



	X	Y	Z
Front Side	X≤1/5a	Y≤0.5mm	z≤t
Back Side	X≤1/5a	Y≤0.5mm	z≤1/2t

When it has defects more than one location, X is the total length of all defects. It cannot be in view area. Defect size cannot be bigger than 25% of each single contact pad.

9. Crack Defect

Minor

Polarizer, Reflection Panel or Glass Panel — Any cracks that trend to extend to longer is rejected

S<0.3mm	Acceptable
0.3mm≤S<0.5mm	Minor
S≥0.5mm	Major

In batch processing if there are two or more bias/oblique at the same time, according to the highest defect level surface can not be soft cloth light wipe or air gun blowing dirty foreign matter (including Buss, dust, solder ball, glue, shadow, etc.) according to the point line specifications to determine — Major

Strip color, stagger, flow trace, glass leaky according to color picture judgment

Viewing angle error is not acceptable;Shows that the water ripple is not acceptable;It's not acceptable to be with a shaking display.

Missing
1. Irregular Black Regiment found in the viewport, light group (extruded glass will move) cannot be accepted — Major
2. Cavitation rebound: Percussion bubbles cannot be accepted

COG
1. IC can not be damaged 、 scratch — minor
2. Sealing glue into the viewport can not be accepted
3. That my be acceptable to have the sealing falling off, if the penetrating glue depth achieves the request.
4. The surface of the coating adhesive position according to the operating document requirements, height can not exceed the polarizing film, ITO line must be with fully covered terminals.

If the above undesirable does not occur in the viewable area, the standard can be properly relaxed

8.RELIABILITY TEST

Test item	Test condition
High temperature storage	80℃，48hr
Low temperature storage	-30℃，240 hr/ -40℃，8hr
High temperature operation	70℃，48 hr
Low temperature operation	-20℃，48 hr
High temperature and high humidity operation	60℃、95%RH，48 hr
Thermal shock	-40℃（30min） 80℃ (30min) 48 cycles

After completing the reliability test, leave the samples under the room temperature and for the following inspection items:

1.No clearly visible defects or deterioration of display quality allowed.

2.No function-related abnormalities.

3.Connected parts still connecting tightly.

4.Display characteristics fulfill initial value，contrast ratio should be an least 30% of initial value.

9. Storage Precautions

9.1 When storing the LCD modules, the following precaution are necessary.

9.2 Store them in a sealed polyethylene bag. If properly sealed, there is no need for the desiccant.

9.3 Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0℃ and 35℃, and keep the relative humidity between 40%RH and 60%RH.

9.4 The polarizer surface should not come in contact with any other objects (We advise you to store them in the anti-static electricity container in which they were shipped).

9.5 Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is s ubject to a low temperature.

9.6 If the LCD modules have been operating for a long time showing the same display patterns, the display patter nsmay remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operatin g status can beregained by suspending use for some time. It should be noted that this phenomenon does not adver sely affect performance reliability.

9.7 To minimize the performance degradation of the LCD modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules.

9.7.1 - Exposed area of the printed circuit board.

9.7.2 -Terminal electrode sections.