

PRODUCT : LCD MODULE

MODEL NO. : YTS700WLAC-01-100N

SUPPLIER : ANSHAN YES

DATE : JULY,20,2013

SPECIFICATION

Approved	Checked	Department
NiuHongLi		TP&TFT LCM Department

CUSTOMER:

MODEL NO.:

DATE:

Approved	Checked	Department

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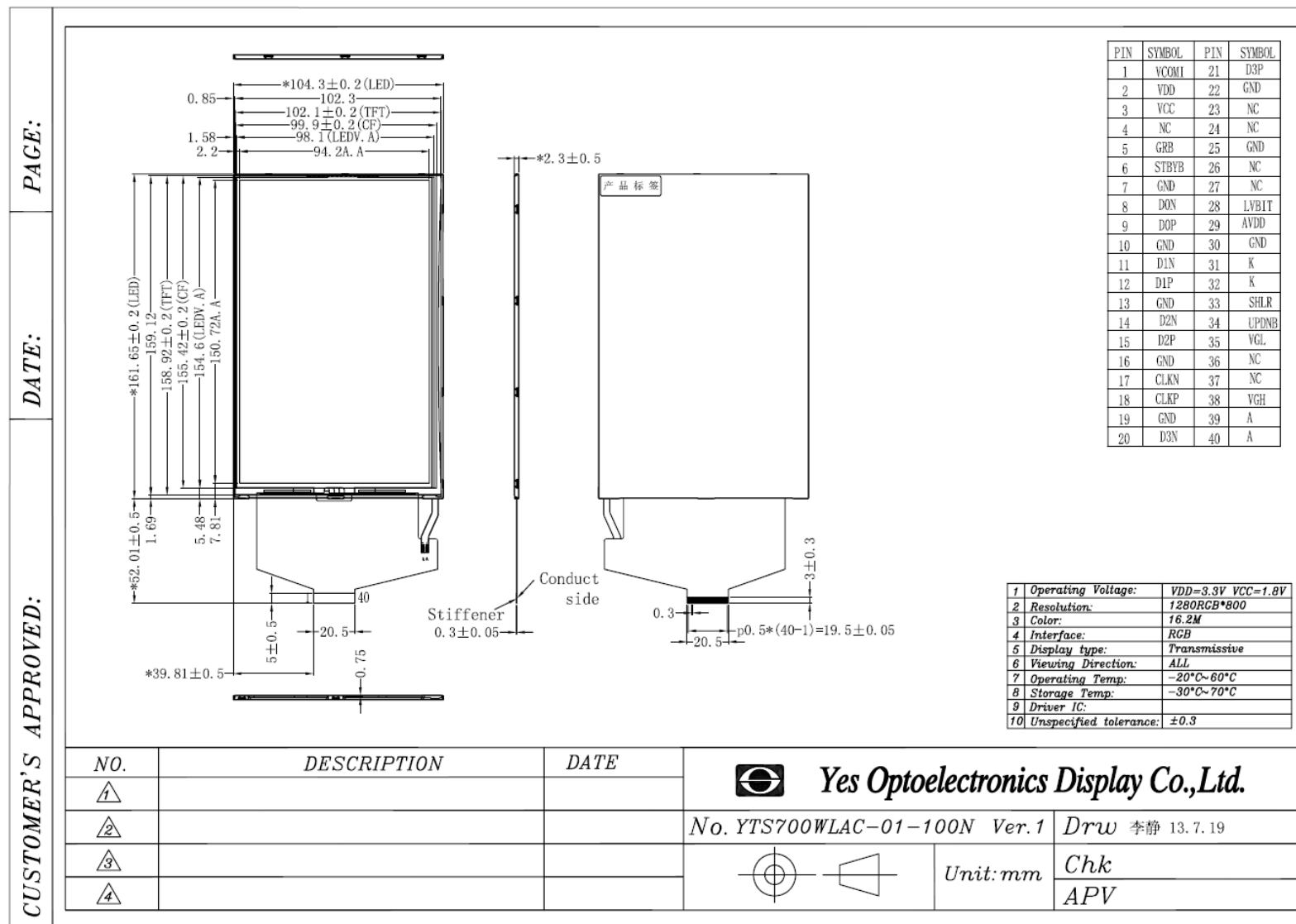
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1. GENERAL INFORMATION

Item	Cont	Unit
LCD Type	TFT TRANSMISSIVE	/
Viewing direction	All	O' Clock
Module Size (W - H)	161.65*104.3	mm
Active area (W - H)	150.72*94.2	mm
Number of Dots	1280(RGB) *800	/
Colors	16.2M	/
Interface	RGB	/
Operating voltage	3.3	V
Operation Temperature Range	-20~60	°C
Storage Temperature Range	-30~70	°C
Surface luminance	197	cd/m ²

2. EXTERNAL DIMENSIONS



3. ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Min.	Max.	Unit	Remark
Power voltage	VDD	GND=0	-0.5	5	V	
	VCC	GND=0	-0.3	2	V	
	AVDD	GND=0	-0.5	15	V	
	V1~V14	GND=0	-0.5	15	V	
	VCOMI	GND=0	-0.5	15	V	
	VGH	GND=0	-0.3	40	V	
	VGL	GND=0	-20	0.3	V	
	VBR	GND=0	VGL	VGH	V	

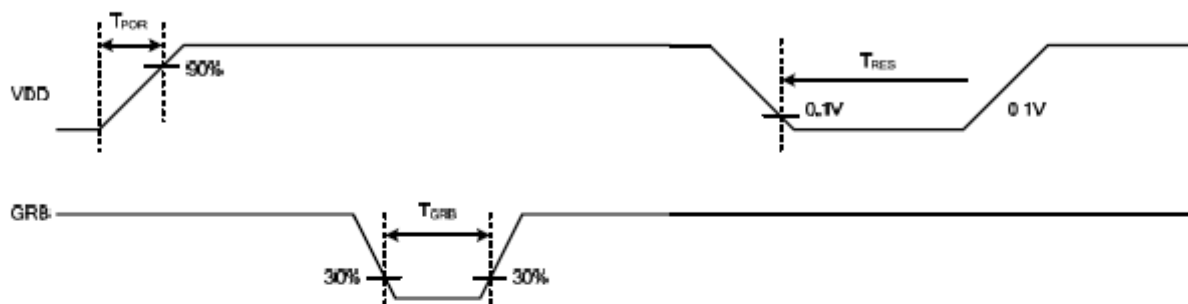
Note 1:Functional operation should be restricted under ambient temperature (25

Note 2:Maximum ratings are those values beyond which damages to the device may occur. Functional operation should be restricted to the limits in the Electrical Characteristics chapter.

4. AC Characteristics

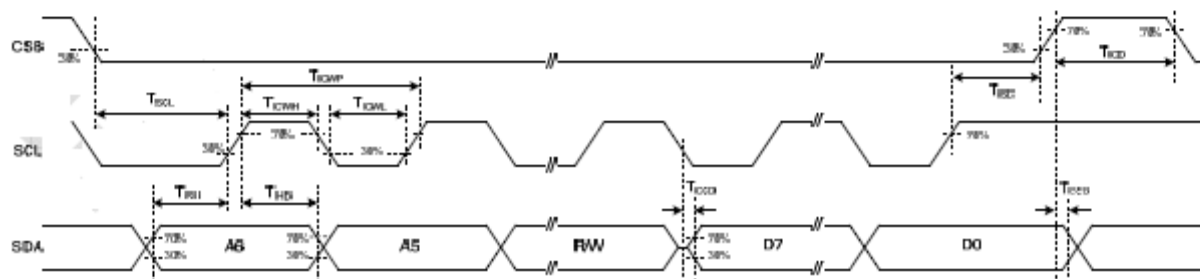
a. Input AC characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
VDD power on slew time	T_{POR}	-	-	15	ms	From 0V to 90% VDD
GRB active pulse width	T_{GRB}	1	-	-	ms	VDD=3.3V
VDD resettle time	T_{RES}	1	-	-	s	



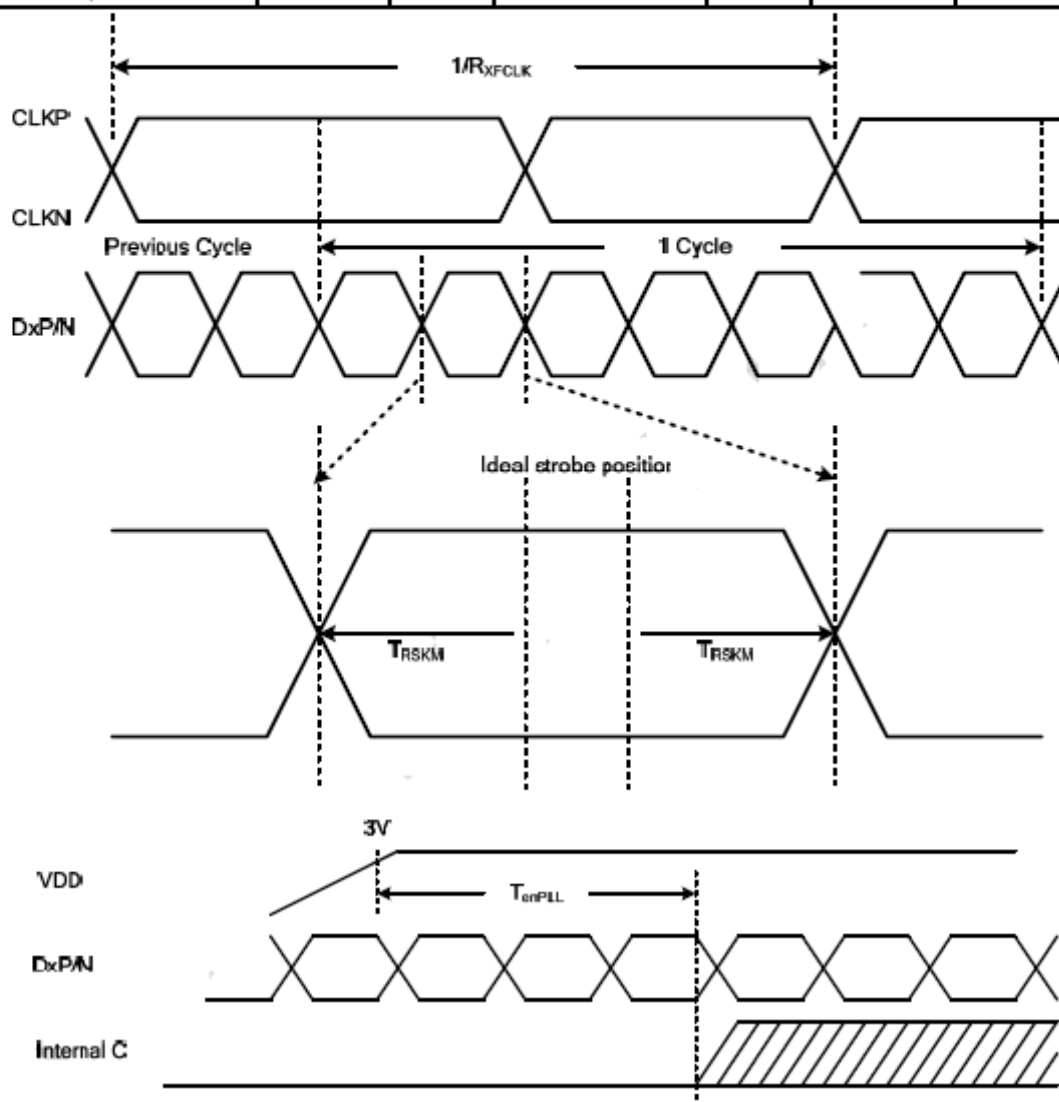
b. 3-wire interface AC characteristic

Item	Symbol	Min	Typical	Max	Unit
CSB falling to SCL rising time	T_{SCL}	300	-	-	ns
SCL pulse low width	T_{ICWL}	200	-	-	ns
SCL pulse high width	T_{ICWH}	200	-	-	ns
SCL pulse width	T_{ICWP}	350	-	-	ns
SDA data input setup time	T_{ISU}	200	-	-	ns
SDA data input hold time	T_{IHD}	200	-	-	ns
SCL rising to CSB rising time	T_{ISC}	350	-	-	ns
SCL falling to SDA output delay time	T_{CDD}	-	-	30	ns
CSB rising to falling time	T_{ICD}	1	-	-	us



c. LVDS Signal AC Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Clock frequency	R_{XFCLK}	60	-	-	MHz	
Input data skew margin	T_{RSKM}	1000	-	-	pS	
Clock high time	T_{LVCH}	-	$4/(7 \times R_{XFCLK})$	-	nS	
Clock low time	T_{LVCL}	-	$3/(7 \times R_{XFCLK})$	-	nS	
PLL wake-up time	T_{enPLL}	-	-	150	uS	



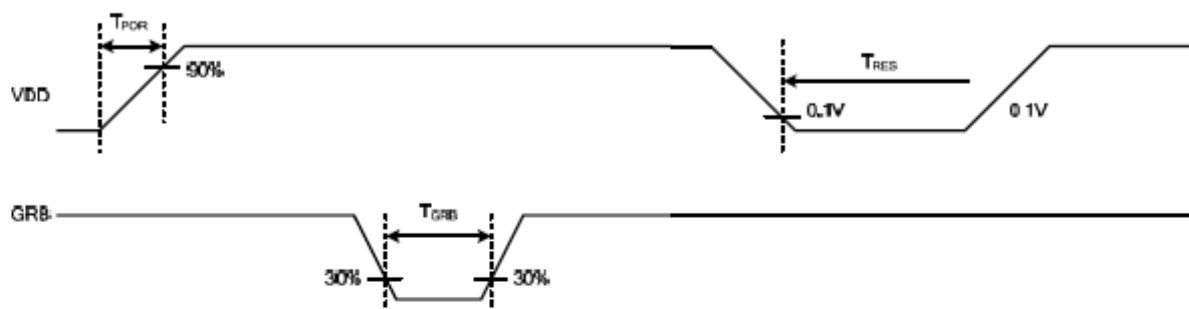
5. BACKLIGHT CHARACTERISTICS

项目 Item	符号 Symbol	最小值 Min	典型值 Typ	最大值 Max	单位 Unit	条件 Condition
正向电压 Forward Voltage	Vf	9.0	9.9	10.5	V	If=180mA
色坐标 Chromaticity (Point ⑤) Coordinates Ranks	X	0.24	----	0.32	---	If=180mA
	Y	0.25	----	0.33		
背光亮度 (9 Point AVG) BackLight Luminance	LV	5000	5800	----	cd/m ²	If=180mA
均匀性 Uniformity	△LV	75%	----	----	%	Min/Max*100

6. ELECTRO-OPTICAL CHARACTERISTICS

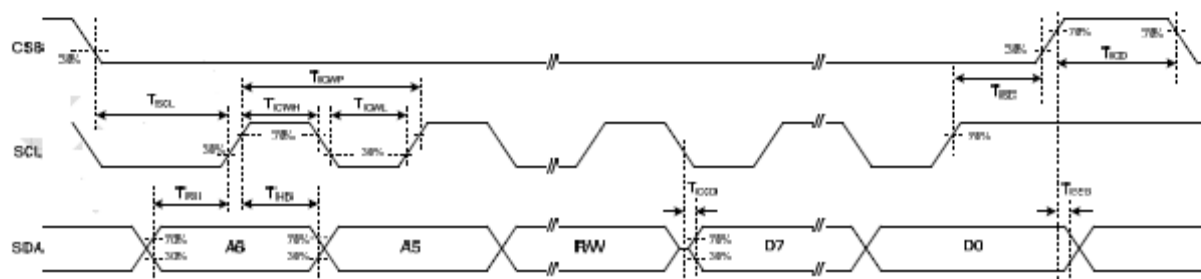
a. Input AC characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
VDD power on slew time	T_{POR}	-	-	15	ms	From 0V to 90% VDD
GRB active pulse width	T_{GRB}	1	-	-	ms	VDD=3.3V
VDD resettle time	T_{RES}	1	-	-	s	



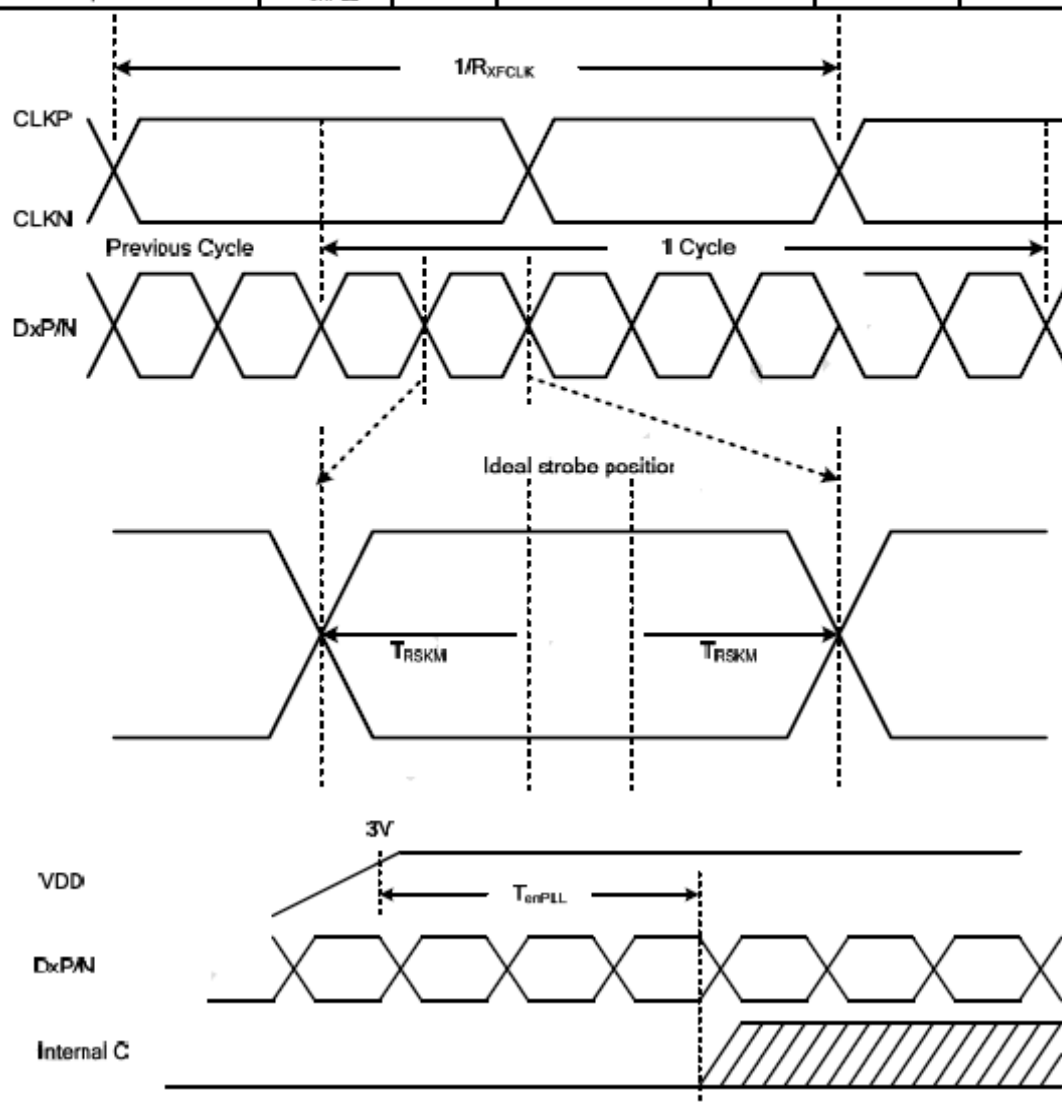
b. 3-wire interface AC characteristic

Item	Symbol	Min	Typical	Max	Unit
CSB falling to SCL rising time	T_{SCL}	300	-	-	ns
SCL pulse low width	T_{ICWL}	200	-	-	ns
SCL pulse high width	T_{ICWH}	200	-	-	ns
SCL pulse width	T_{ICWP}	350	-	-	ns
SDA data input setup time	T_{ISU}	200	-	-	ns
SDA data input hold time	T_{IHD}	200	-	-	ns
SCL rising to CSB rising time	T_{ISC}	350	-	-	ns
SCL falling to SDA output delay time	T_{CDD}	-	-	30	ns
CSB rising to falling time	T_{ICD}	1	-	-	us



c. LVDS Signal AC Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Clock frequency	R_{XFCLK}	60	-	-	MHz	
Input data skew margin	T_{RSKM}	1000	-	-	pS	
Clock high time	T_{LVCH}	-	$4/(7 \times R_{XFCLK})$	-	nS	
Clock low time	T_{LVCL}	-	$3/(7 \times R_{XFCLK})$	-	nS	
PLL wake-up time	T_{enPLL}	-	-	150	uS	



7. INTERFACE DESCRIPTION

Pin No.	Symbol	Description
1	VCOMI	VCOM to Cell.
2	VDD	Power Supply
3	VCC	VCC LDO output for internal digital circuit use
4	NC	No Connection
5	GRB	Global reset pin.
6	STBYB	STBYG mode, Normally pull Low.
7	GND	Ground
8	D0N	LVDS differential signal
9	D0P	LVDS differential signal
10	GND	Ground
11	D1N	LVDS differential signal
12	D1P	LVDS differential signal
13	GND	Ground
14	D2N	LVDS differential signal
15	D2P	LVDS differential signal
16	GND	Ground
17	CLKN	Negative LVDS differential clock input.
18	CLKP	Negative LVDS differential clock input.
19	GND	Ground
20	D3N	LVDS differential signal
21	D3P	LVDS differential signal
22	GND	Ground
23	NC	No Connection
24	NC	No Connection
25	GND	Ground
26	NC	No Connection
27	NC	No Connection
28	LVBIT	6-bit/8-bit input select LVDS mode. Normally pull high.

29	AVDD	Power supply for analog circuits
30	GND	Ground
31	K	LED Pin(-)
32	K	LED Pin(-)
33	SHLR	Source Right or Left sequence control.
34	UPDNB	Griver Up or Down sequence control. Normally pull high
35	VGL	VGL Voltage
36	NC	No Connection
37	NC	No Connection
38	VGH	VGH Voltage.
39	A	LED Pin(+)
40	A	LED Pin(+)

8. APPLICATION CIRCUIT

Please consult our technical department for detail information.

9. INITIAL CODE

Please consult our technical department for detail information

10. RELIABILITY TEST

No.	Test Item	Test Condition	Inspection after test
1	High Temperature Storage	70 \pm 2 $^{\circ}$ C/200 hours	Inspection after 2~4hours 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	-30 \pm 2 $^{\circ}$ C/200 hours	
3	High Temperature Operating	60 \pm 2 $^{\circ}$ C/120 hours	
4	Low Temperature Operating	-20 \pm 2 $^{\circ}$ C/120 hours	
5	Temperature Cycle	-20 $^{\circ}$ C ~25 $^{\circ}$ C~60 $^{\circ}$ C \times 10cycles (30min.) (5min.) (30min.)	
6	Damp Proof Test	50 $^{\circ}$ C \pm 5 $^{\circ}$ C \times 90%RH/120 hours	
7	Vibration Test	Frequency: 10Hz~55Hz~10Hz Amplitude: 1.5mm, X, Y, Z direction for total 3hours (Packing condition)	
8	Drooping test	Drop to the ground from 1m height, one time, every side of carton. (Packing condition)	
9	ESD test	Voltage: \pm 8KV R: 330 Ω C: 150pF Air discharge, 10time	

Remark:

- 1.The test samples should be applied to only one test item.
- 2.Sample size for each test item is 5~10pcs.
- 3.For Damp Proof Test, Pure water(Resistance> 10M Ω) should be used.
- 4.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.
- 5.EL evaluation should be excepted from reliability test with humidity and temperature: Some defects such as black spot/blemish can happen by natural chemical reaction with humidity and Fluorescence EL has.
- 6.Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.
- 7.Please use automatic switch menu(or roll menu) testing mode when test operating mode.

11. INSPECTION CRITERION

OUTGOING QUALITY STANDARD

PAGE 1 OF 4

TITLE:FUNCTIONAL TEST & INSPECTION CRITERIA

This specification is made to be used as the standard acceptance/rejection criteria for Color mobile phone LCM.

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

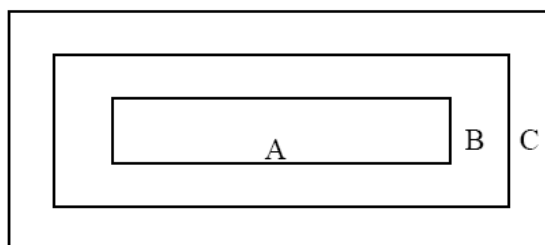
Minor defect: AQL 1.5

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.

3. Definition of inspection zone in LCD.



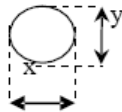
Zone A: character/Digit area

Zone B: viewing area except Zone A (ZoneA+ZoneB=minimum Viewing area)

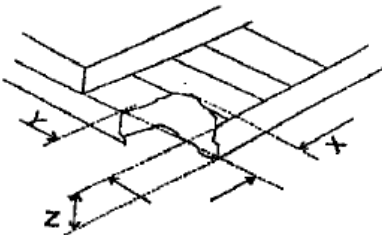
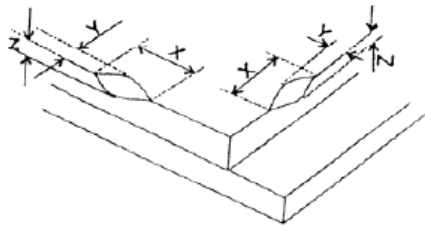
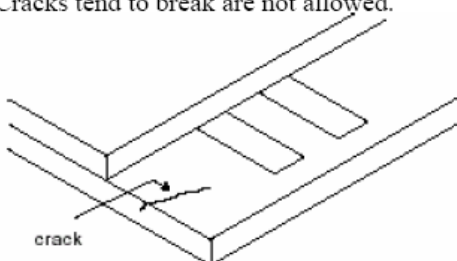
Zone C: Outside viewing area (invisible area after assembly in customer's product)

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.

OUTGOING QUALITY STANDARD			PAGE 2 OF 4			
TITLE:FUNCTIONAL TEST & INSPECTION CRITERIA						
4. Inspection standards						
4.1 Major Defect						
Item No	Items to be inspected	Inspection Standard		Classification of defects		
4.1.1	All functional defects	1) No display 2) Display abnormally 3) Missing vertical, horizontal segment 4) Short circuit 5) <u>Back-light no lighting, flickering and abnormal lighting.</u>		Major		
4.1.2	Missing	Missing component				
4.1.3	Outline dimension	Overall outline dimension beyond the drawing is not allowed.				
4.2 Cosmetic Defect						
Item No	Items to be inspected	Inspection Standard		Classification of defects		
4.2.1	Clear Spots	For dark/white spot, size Φ is defined as $\Phi = (x+y)/2$ 		Minor		
	Black and white Spot defect Pinhole, Foreign Particle, Dirt under polarizer	1.				
		Size(mm) \ Zone	Acceptable Qty			
			A		B	C
		$\Phi \leq 0.10$	Ignore		Ignore	
		$0.10 < \Phi \leq 0.15$	2			
		$0.15 < \Phi \leq 0.20$	1			
		$\Phi > 0.20$	0			
	Dim Spots	2.		Minor		
	Circle shaped and dim edged defects	2. Zone Size(mm) \	Acceptable Qty			
			A		B	C
		$\Phi \leq 0.2$	Ignore		Ignore	
		$0.20 < \Phi \leq 0.40$	3			
		$0.40 < \Phi \leq 0.60$	2			
		$0.60 < \Phi \leq 0.80$	1			
		$0.80 < \Phi$	0			

OUTGOING QUALITY STANDARD				PAGE 3 OF 4			
TITLE: FUNCTIONAL TEST & INSPECTION CRITERIA							
4.2. Cosmetic Defect							
Item No	Items to be inspected	Inspection Standard				Classification of defects	
4.2.2	Line defect Black line, White line, Foreign material under polarizer,	Size(mm)		Acceptable Qty			Minor
		L(Length)	W(Width)	Zone			
				A	B	C	
		Ignore	$W \leq 0.02$	Ignore		Ignore	
		$L \leq 3.0$	$0.02 < W \leq 0.03$	2			
		$L \leq 2.0$	$0.03 < W \leq 0.05$	1			
			$0.05 < W$	Define as spot defect			
4.2.3	Polarizer scratch	Size(mm)		Acceptable Qty			Minor
		L(Length)	W(Width)	Zone			
				A		B	
		Ignore	$W \leq 0.03$	Ignore		Ignore	
		$5.0 < L \leq 10.0$	$0.03 < W \leq 0.05$	2			
		$L \leq 5.0$	$0.05 < W \leq 0.08$	1			
			$0.08 < W$	0			
4.2.4	Polarize Air bubble	Air bubbles between glass & polarizer				Minor	
		2. Zone Size(mm)	Acceptable Qty				
			A	B	C		
		$\Phi \leq 0.2$	Ignore		Ignore		
		$0.20 < \Phi \leq 0.30$	2				
		$0.30 < \Phi \leq 0.50$	1				
		$0.50 < \Phi$	0				

OUTGOING QUALITY STANDARD		PAGE 4 OF 4							
TITLE:FUNCTIONAL TEST & INSPECTION CRITERIA									
4.3. Cosmetic Defect									
Item No	Items to be inspected	Inspection Standard	Classification of defects						
4.3.5	Glass defect	(i) Chips on corner  <table border="1"><tr><td>X</td><td>Y</td><td>Z</td></tr><tr><td>≤2.0</td><td>≤S</td><td>Disregard</td></tr></table> <p>Notes: S=contact pad length Chips on the corner of terminal shall not be allowed to extend into the ITO pad or expose perimeter seal.</p>	X	Y	Z	≤2.0	≤S	Disregard	Minor
		X	Y	Z					
		≤2.0	≤S	Disregard					
(ii)Usual surface cracks  <table border="1"><tr><td>X</td><td>Y</td><td>Z</td></tr><tr><td>≤3.0</td><td><Inner border line of the seal</td><td>Disregard</td></tr></table>	X	Y	Z	≤3.0	<Inner border line of the seal	Disregard	Minor		
X	Y	Z							
≤3.0	<Inner border line of the seal	Disregard							
(iii) Crack Cracks tend to break are not allowed. 	Major								
4.3.6	Parts alignment	1) Not allow IC and FPC/heat-seal lead width is more than 50% beyond lead pattern. 2) Not allow chip or solder component is off center more than 50% of the pad outline.	Minor						
4.3.7	SMT	According to the <Acceptability of electronic assemblies> IPC-A-610C class 2 standard. Component missing or function defect are Major defect, the others are Minor defect.							

12. Packaging

CUSTOMER'S APPROVED:

DATE: 2013.07.20

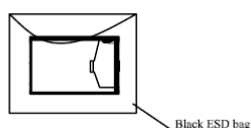
PAGE: 1/1

PRODUCT PART NO.:YTS700WLAC-01-100N

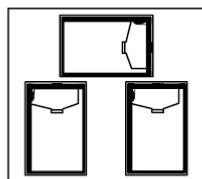
PACKING TYPE: BY EPE TRAY(T320240A)

PACKLING ORDER:

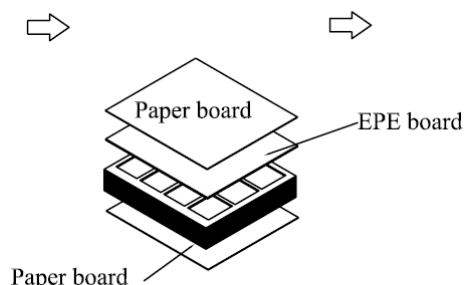
1) Putting Modules into each black ESD bag.



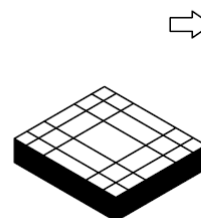
2) Putting 3 pcs Modules with black ESD bags on each EPE tray.



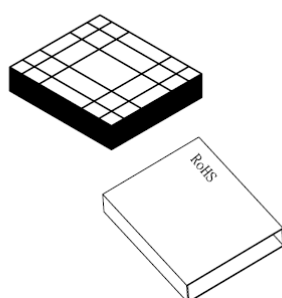
3) Putting 4 pcs EPE trays together with EPE paper on the top of EPE tray.



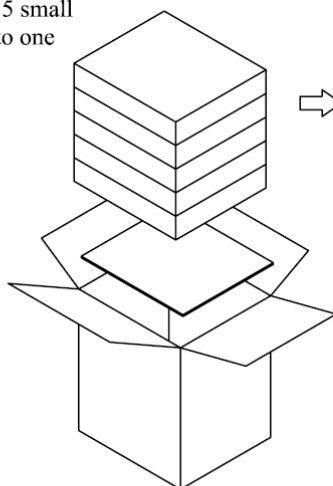
4) Assembling the boards and the trays together with adhesive tape.



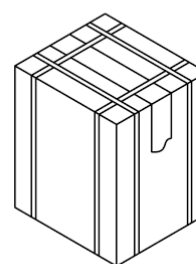
5) Putting in the inner small carton .(TYPE:抽屉式包装盒)



6) Putting 5 small cartons into one outcarton.



7) Packing finished.



Note: 3 pcs in a tray, 4 trays in a inner carton, 5 inner cartons in a out carton, so 3x4x5=60pcs/Outcarton

Dimension (Small carton): 385*325*87mm

Dimension (Out carton): 394*344*470mm

NO. YTS700WLAC-01-100N

Drw:

Chk:

Apv:

ANSHAN YES OPTOELECTRONICS DISPLAY CO., LTD

13. PRECAUTIONS FOR USING LCD MODULES

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.

Storage Precautions

When storing the LCD modules, the following precaution is necessary.

- (1) Store them in a sealed polyethylene bag. If properly sealed, there is no need for the dessicant.
- (2) Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0°C and 35°C.
- (3) The polarizer surface should not come in contact with any other objects. (We advise you to store them in the container in which they were shipped).

Others

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 subject to a low temperature.

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

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.

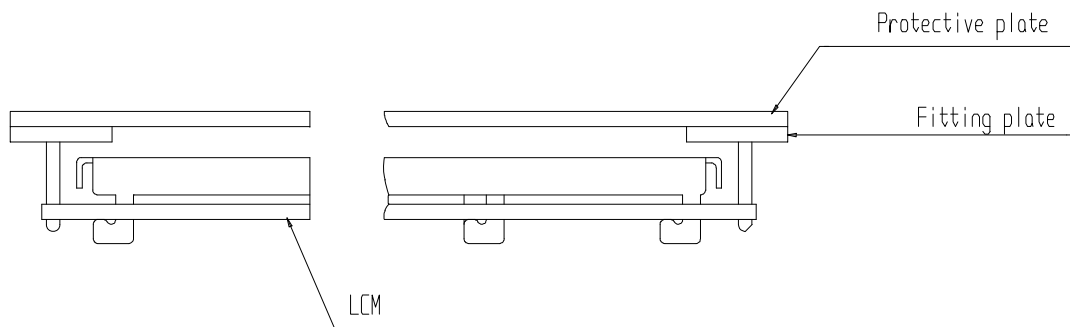
- Exposed area of the printed circuit board.
- Terminal electrode sections.

USING LCD MODULES

Installing LCD Modules

The hole in the printed circuit board is used to fix LCM as shown in the picture below. Attend to the following items when installing the LCM.

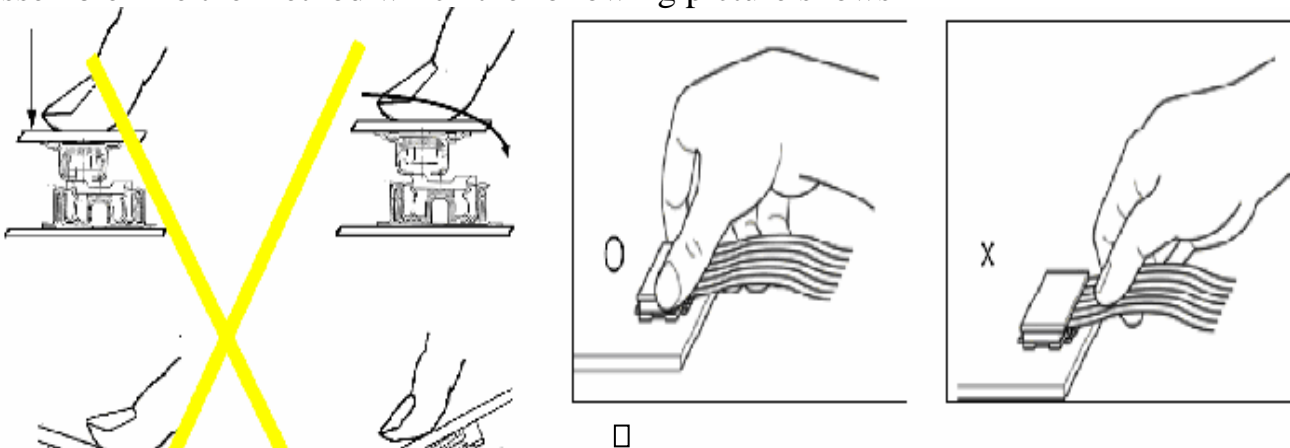
- (1) Cover the surface with a transparent protective plate to protect the polarizer and LC cell.



- (2) When assembling the LCM into other equipment, the spacer to the bit between the LCM and the fitting plate should have enough height to avoid causing stress to the module surface, refer to the individual specifications for measurements. The measurement tolerance should be $\pm 0.1\text{mm}$.

Precaution for assemble the module with BTB connector:

Please note the position of the male and female connector position, don't assemble or assemble like the method which the following picture shows



Precaution for soldering to the LCM

	Hand soldering	Machine drag	Machine press soldering
No ROHS	290°C ~350°C. Time : 3-5S.	330°C ~350°C. Speed : 4-8 mm/s.	300°C ~330°C. Time : 3-6S.
ROHS product	340°C ~370°C. Time : 3-5S.	350°C ~370°C. Time : 4-8 mm/s.	330°C ~360°C. Time : 3-6S.

(1)If soldering flux is used, be sure to remove any remaining flux after finishing to soldering operation. (This does not apply in the case of a non-halogen type of flux.) It is recommended that you protect the LCD surface with a cover during soldering to prevent any damage due to flux spatters.

(2) When soldering the electroluminescent panel and PC board, the panel and board should not be detached more than three times. This maximum number is determined by the temperature and time conditions mentioned above, though there may be some variance depending on the temperature of the soldering iron.

(3) When remove the electroluminescent panel from the PC board, be sure the solder has completely melted, the soldered pad on the PC board could be damaged.

Precautions for Operation

(1) Viewing angle varies with the change of liquid crystal driving voltage (VLCD).

Adjust VLCD to

show the best contrast.

(2) It is an indispensable condition to drive LCD's within the specified voltage limit since the higher voltage then the limit cause the shorter LCD life. An electrochemical reaction due to direct current causes LCD's undesirable deterioration, so that the use of direct current drive should be avoided.

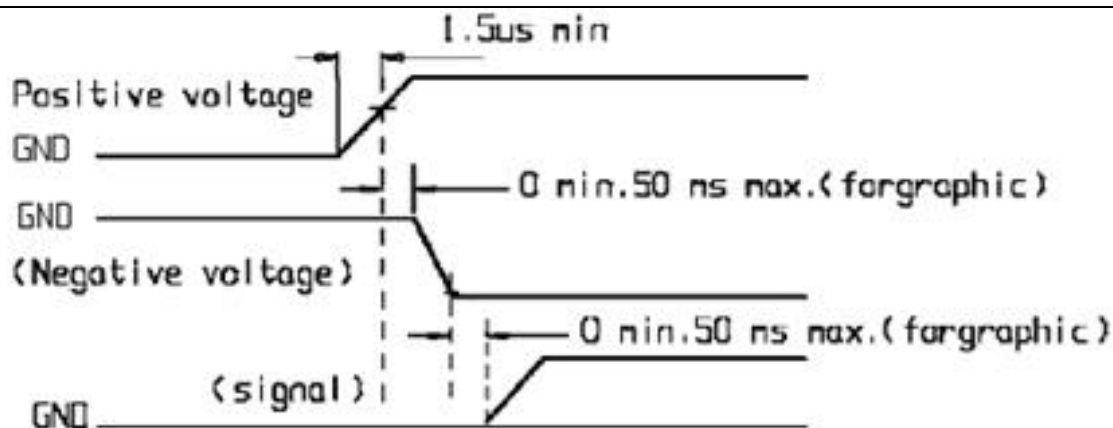
(3) Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD's show dark color in them. However those phenomena do not mean malfunction or out of order with LCD's, Which will come back in the specified operating temperature.

(4) If the display area is pushed hard during operation, the display will become abnormal. However, it will return to normal if it is turned off and then back on.

(5) A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit. Usage under the maximum operating temperature, 50% RH or less is required.

(6) Input each signal after the positive/negative voltage becomes stable.

(7) Please keep the temperature within specified range for use and storage. Polarization degradation, bubble generation or polarizer peel-off may occur with high temperature and high humidity.



Safety

(1) It is recommended to crush damaged or unnecessary LCDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned.

(2) If any liquid leaks out of a damaged glass cell and comes in contact with the hands, wash off thoroughly with soap and water.

14. PRIOR CONSULT MATTER

1.①For YES standard products, we keep the right to change material, process ... for improving the product property without notice on our customer.

②For OEM products, if any change needed which may affect the product property, we will

consult with our customer in advance.

2.If you have special requirement about reliability condition, please let us know before you start

the test on our samples.

15. FACTORY

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