



SPECIFICATION

Model: LX101A4011A400N

ACCEPTED BY CUSTOMER	
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Product: 10.1" TFT 1024(RGB) *600 Pixels

Version: V00

Date: 2016/06/22

APPROVED	CHECKED	PREPARED



Catalog:

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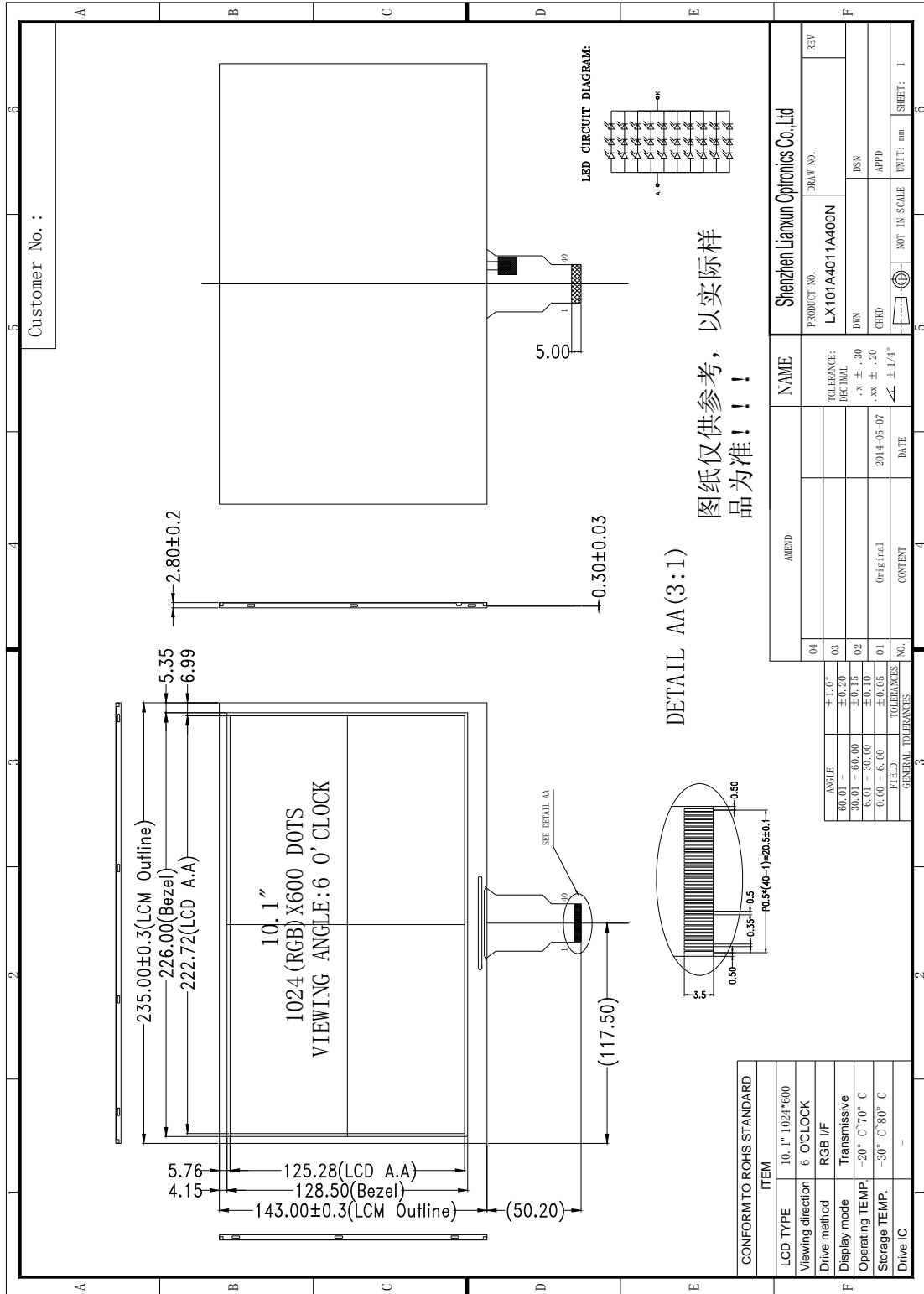
1. History Version

Sample version	Doc. version	Date	Description	Modify
V00	V00	2016-06-22	First issue	MXJ

2. Mechanical Description

Name	Content	Unit
Outline Size	235.0(W) * 143.0 (H) * 2.80(T)	mm
Module size	10.1 (V.A)	inch
Resolution	1024(RGB)* 600Pixels	-
Viewing size	222.72(W) * 125.28(H)	mm
Pixel size	0.2175 * 0.2088	mm
LCD Type	TFT (16.7M)/ Transmissive / Positive	-
Viewing Angle	6 0' clock	-
Driver IC	-	-
Backlight Type	30 LEDs	-
Interface Type	4 LANE LVDS	-

3. Mechanical Drawing



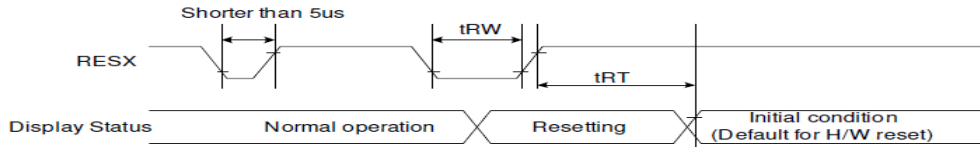
Shenzhen Lianxun Optronics Co.,Ltd

4. Interface Definition

Pin NO.	Symbol	description	Note
1	VCOM	Regulator output for common voltage of panel.	
2-3	VDD	Digital Power supply	
4	NC		
5	GRB	Global reset. Keep VDD during operation. Normally pull high.	
6	STBYB	Standby mode control. Normally pull High.	
7	GND	System ground	
8	R0N	Negative D0 differential data signals input.	
9	R0P	Positive D0 differential data signals input.	
10	GND	System ground	
11	R1N	Negative D1 differential data signals input.	
12	R1P	Positive D1 differential data signals input.	
13	GND	System ground	
14	R2N	Negative D2 differential data signals input.	
15	R2P	Positive D2 differential data signals input.	
16	GND	System ground	
17	RXCLKN	Negative LVDS differential clock input.	
18	RXCLKP	Positive LVDS differential clock input.	
19	GND	System ground	
20	R3N	Negative D3 differential data signals input.	
21	R3P	Positive D3 differential data signals input.	
22	GND	System ground	
23-34	NC		
25	GND	System ground	
26	NC		
27	DIMO	Backlight dimmer signal for external controller.	
28	HSD	6-bit/8-bit input select. H:6bit;L:8BIT;	
29	AVDD	Analog Power supply	
30	GND	System ground	
31-32	LEDK	Power for LED backlight (Catgode)	
33	L/R	Source Right or Left sequence control. Normally pull high.	
34	U/P	Gate Driver Up/down scan setting. Normally pull low. When UPDN=H, reverse scan.	
35	VGL	Low voltage level for gate circuit of panel.	
36-37	CABCEN1-0	CABC H/W enable pin. Normally pull low. When CABC_EN=" 00" CABC off; " 01" user interface Image;" 10" still Picture;" 11" moving Image.	
38	VGH	High voltage level for gate control signals and gate circuit of panel.	
39-40	LEDA	Power for LED backlight (Anode)	

5. Interface Timing:

5.1 Reset Timing



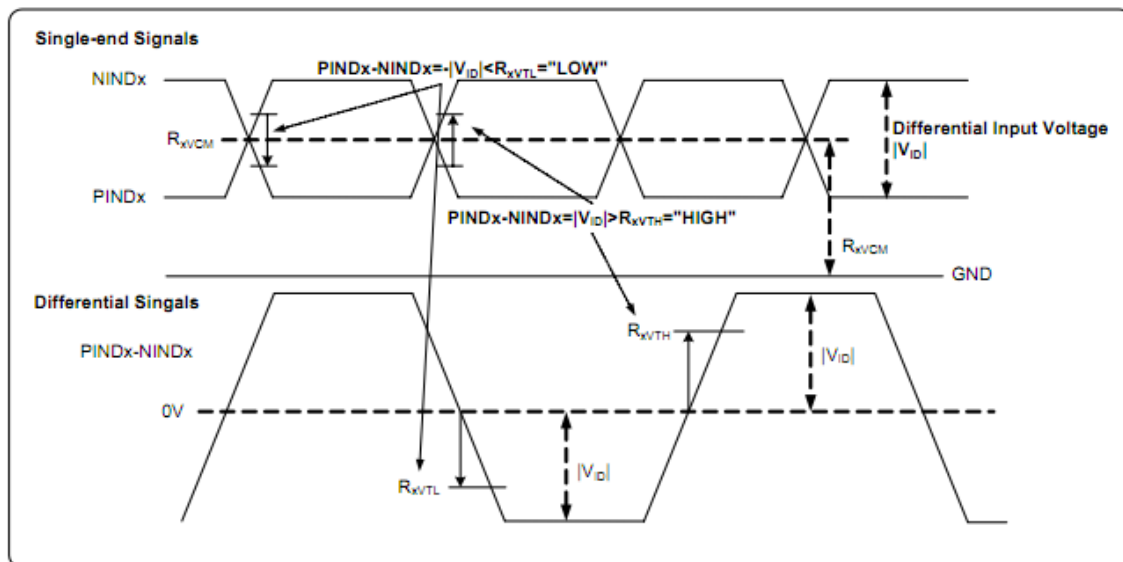
Signal	Symbol	Parameter	Min	Max	Unit
RESX	tRW	Reset pulse duration	10	5 (note 1,5)	μS
	tRT	Reset cancel		120 (note 1,6,7)	mS

5.2 LVDS Interface Timing

LVDS mode DC electrical characteristics

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Differential input high Threshold voltage	R_{XVTH}	-	-	+0.1	V	$R_{XVCM}=1.2V$
Differential input low threshold voltage	R_{XVTL}	-0.1	-	-	V	
Input voltage range (singled-end)	R_{XVIN}	0	-	$VDD-1.2+$ $ V_{ID} /2$	V	-
Differential input common Mode voltage	R_{XVCM}	$ V_{ID} /2$	-	$VDD-1.2$	V	-
Differential input voltage	$ V_{ID} $	0.2	-	0.6	V	-
Differential input leakage Current	$R_{V_{XIZ}}$	-10	-	+10	μA	-
LVDS Digital Operating Current	I _{ddlvs}	-	15	30	mA	Fclk=65MHz, VDD=3.3V
LVDS Digital Stand-by Current	I _{stlvs}	-	10	50	μA	Clock & all Functions are stopped

LVDS mode DC electrical characteristics

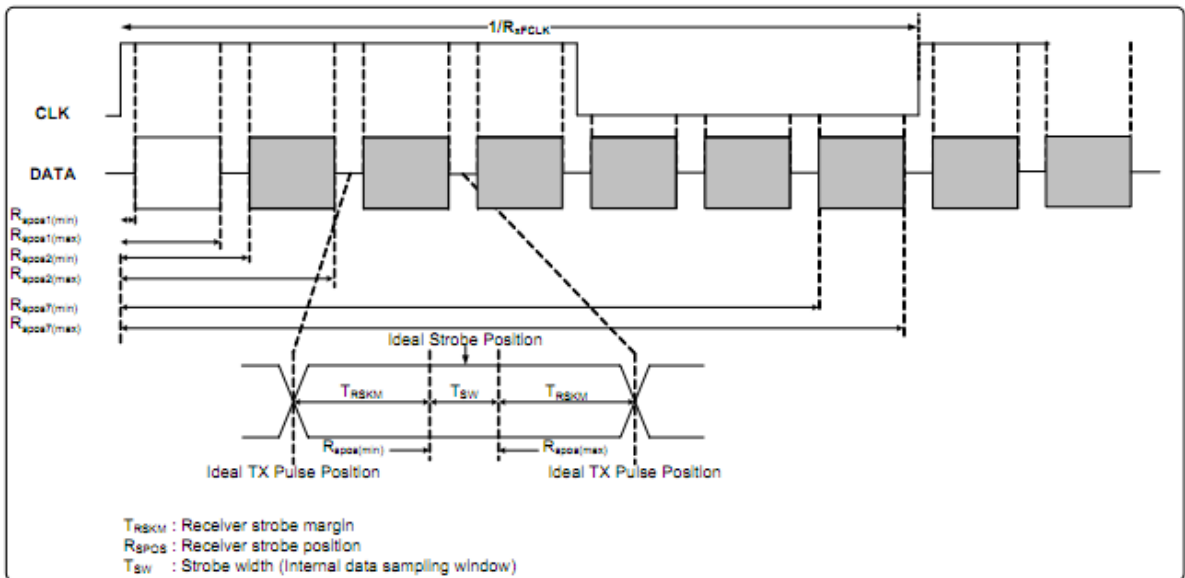
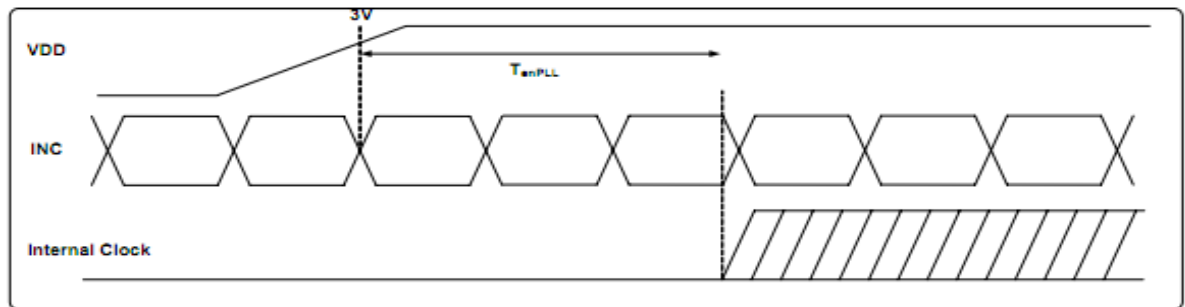
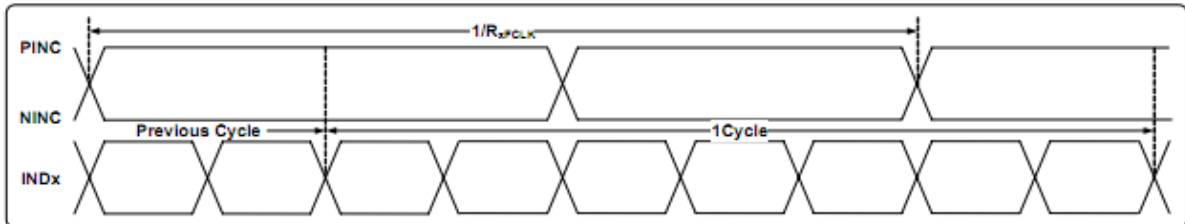


Single-end signals

5.3 AC Timing Diagram LVDS mode AC electrical characteristics

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Clock frequency	R_{XFCLK}	20	-	71	MHz	-
Input data skew margin	T_{RSKM}	500	-	-	pS	$ V_{ID} =400mV$ $R_{XVCM}=1.2V$ $R_{XFCLK}=71MHz$
Clock high time	T_{LVCH}	-	$4/(7 * R_{XFCLK})$	-	ns	-
Clock low time	T_{LVCL}	-	$3/(7 * R_{XFCLK})$	-	ns	-
PLL wake-up time	T_{emPLL}	-	-	150	μS	-

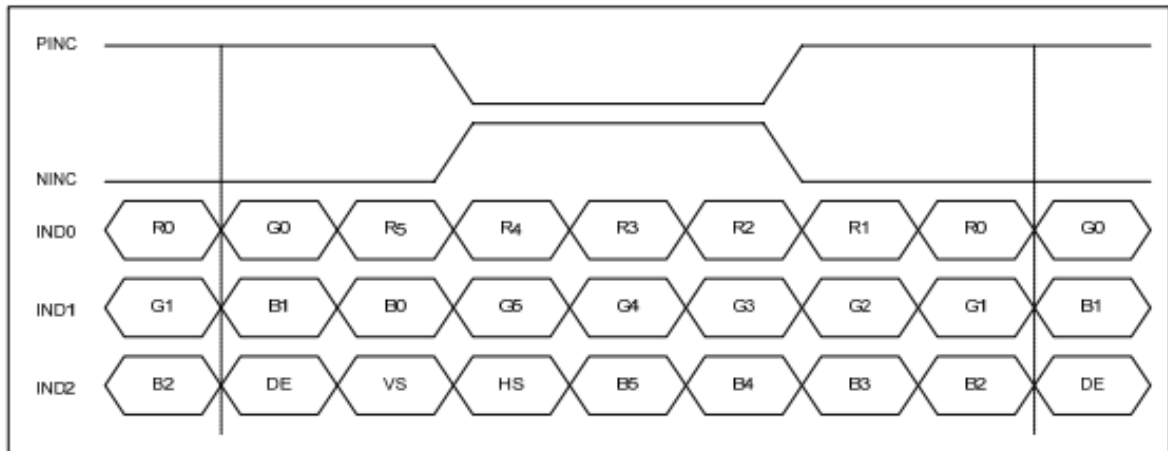
LVDS mode AC electrical characteristics



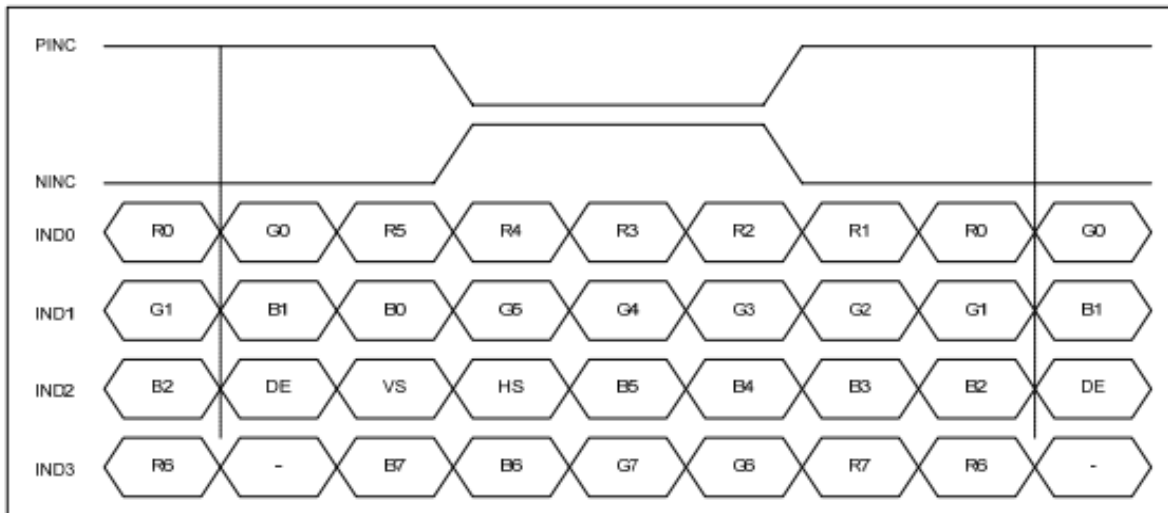
LVDS figure

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Modulation Frequency	SSC_{MF}	23	-	93	KHz	-
Modulation Rate	SSC_{MR}	-	-	± 3	%	LVDS clock =71MHz center spread

5.4 LVDS mode data input format



6-bit LVDS input



8-bit LVDS Input

6. Absolute Maximum Ratings:

Name	symbol	Min	Type	Max	Unit
Operation Temperature	Top	-20	-	70	°C
Storage Temperature	Tst	-30	-	80	°C

7. DC Characteristics

Name	Symbol	Min	Type	Max	Unit
Logical supply Voltage	DVDD	3.0	3.3	3.6	V
TFT Gate on Voltage	VGH	18	19	20	V
TFT Gate off Voltage	VGL	-8.7	-8	-7.3	V
TFT common electrode voltage	VCOM	-	3.2	-	V
Analog power supply Voltage	AVDD	8.075	8.375	8.675	V
Current Consumption	IDD	-	TBD	-	mA

Note1: Please adjust VCOM to make the flicker level be minimum

8. Backlight :

Name	Min	Type	Max	Unit
Current	150	200	250	mA
Voltage	8.4	9.3	10.2	V
Power Consumption	-	1860	-	mW
luminance	350	400	-	CD/M ² (Note1)
Luminance uniformity	75%	80%	-	(Note2)
X Color Coordinates	-	TBD	-	
Y Color Coordinates	-	TBD	-	

Note1: This luminance is tested with assembling the LCD.

Note2: Definition of Luminance Uniformity.

Active area is divided into 9 measuring areas (Refer to Fig. 4-4).Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (Yu)} = \frac{B_{\min}}{B_{\max}}$$

L-----Active area length W----- Active area width

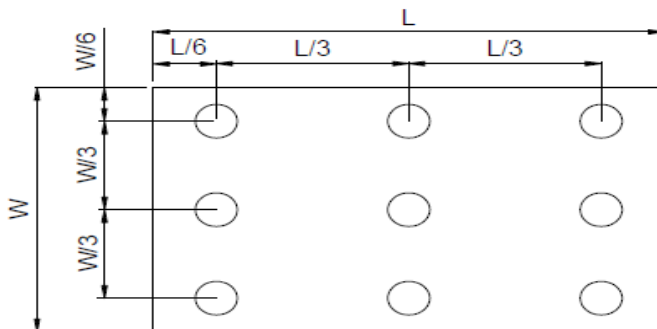


Fig. 4-4 Definition of measuring points

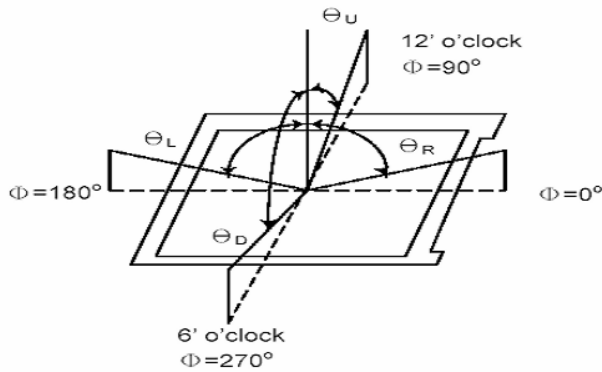
B_{max}: The measured maximum luminance of all measurement position.

B_{min}: The measured minimum luminance of all measurement position.

9. Optical Specification

Name	Symbol	Min	Type	Max	Unit
Transmittance rate	T (%)	-	4.6	-	%
Contrast ratio	C/R	400	500	-	-
Response time	Tr+Tf	-	32	-	ms
Viewing Angle	θ_U	40	50	-	degree (C/R>10)
	θ_D	60	70	-	
	θ_L	60	70	-	
	θ_R	60	70	-	

*Viewing angle description:

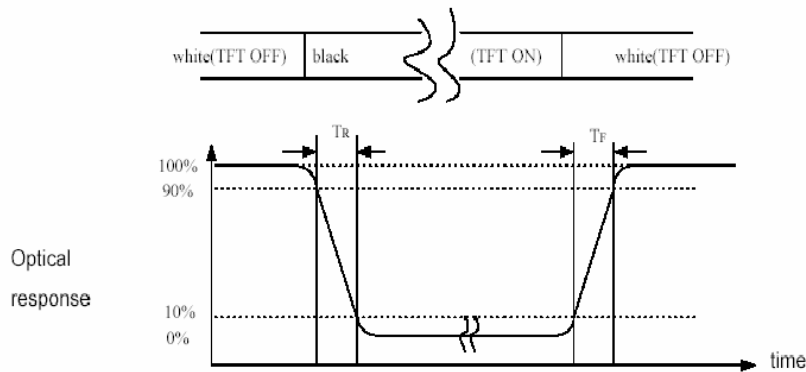


*Contrast rate description(CR) :

Tested in the center of the LCM panel

$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

*Response time description : Sum of TR and TF



10. Reliability testing:

Item No	Name	Condition	Remark
1	High temperature Operating	70° C , 168Hours	Finish product (With polarizer)
2	Low temperature Operating	-20° C , 168 Hours	Finish product (With polarizer)
3	High temperature Storage	80° C , 168 Hours	Finish product (With polarizer)
4	Low temperature Storage	-30° C , 168 Hours	Finish product (With polarizer)
5	High temperature & humidity Storage	60° C , 90%RH, 168 Hours	Finish product (With polarizer)
6	Thermal Shock Storage (No operation)	-20° C , 30min. <=> 70° C , 30min. 10 Cycles	Finish product (With polarizer)
7	ESD test	Voltage:+8KV R:330 ohm,C:150pF Air discharge, 10 times	Finish product (With polarizer)
8	Vibration test	10 => 55 =>10 => 55 => 10 Hz, within 1 minute;Amplitude:1.5mm. 15 minutes for each Direction (X, Y, Z)	Finish product (With polarizer)
9	Drop test	Packed, 100CM free fall 6 sides, 1 corner, 3edges	Finish product (With polarizer)

*One single product test for only one item.

* Judgment after test: keep in room temperature for more than 2 hours.

- Current consumption < 2 times of initial value
- Contrast > 1/2 initial value
- Function: work normally

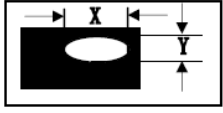
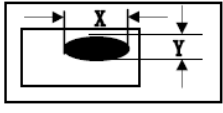
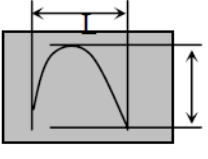
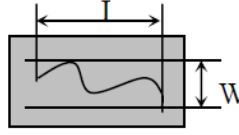
11. Inspection Standard

11.1 Defect Definition

No.	Defect Class	Definition	Content
1	重缺陷 (MA)	影响显示的功能缺陷	短路、断路、缺划、大电流、视角错、漏液、显示不清等
		严重外观缺陷	产品尺寸不符、漏部品等
2	轻缺陷 (MI)	不影响产品功能, 但对产品外观有影响	反黑 / 反白点、偏光片缺陷、针孔、污点

11.2 Standard

No.	Item	Inspection Standard	Classification of defects
1	显示状态	不显、显示乱码、多划、少划、少画面、视角错、闪烁等均不允许	重缺陷
		无法用文字描述的现象, 必要时制定限度样板进行参考。如: 显示不均、显示浓淡、斜纹等	
		显示的颜色效果参照开发、工程样品或按限度样板判定	
		画面切换过程中可见(但非画异)之不良现象(暂停画面时不良现象不可见)不作管控, 客户有特殊要求时依客户要求;	轻缺陷
		仅点背光不显示画面下可见不良现象(但显示画面时不良现象不可见)不作管控, 客户有特殊要求时依客户要求;	轻缺陷
2	背光	LED 灯不亮或闪烁不稳定不允许	重缺陷
		背光电流: 超出规格范围不允许	
		亮眼、漏光: 进入 LCD 的 A、B 区不允许, 必要时按限度样板做判定	轻缺陷
		背光颜色: 根据样品、规格书判定	轻缺陷
		亮度与发光均匀度参照开发、工程或限度样板判定	轻缺陷

No.	Item	Inspection Standard		Classification of defects
3	显示黑点 白点 针孔	直径 ($\Phi = (X+Y) / 2$)	允收数	图示
		$\Phi \leq 0.1$ (密集不可)	不计	
		$0.1 < \Phi \leq 0.15$ [注2]	2	
		$0.15 < \Phi \leq 0.2$	1	
		$\Phi > 0.2$	0	
		注1. 包括: 黑点、白点、针孔、异物。 注2. 整个产品不允许超过2个点, 且间距必须在10mm以上。		
4	显示黑线 白线	尺寸 (L: 线长; W: 线宽)	允收数	图示
		L 不计 W < 0.03 (密集不可)	不计	
		$L \leq 2$ $0.03 \leq W \leq 0.05$ [注 2]	2	
		L 不计 W > 0.05	以点判断	
		注1. 包括: 显示黑线、白线、线状异物。 注2. 单个产品不允许超过2个线状缺陷, 且缺陷距离必须大于10mm以上。		
5	触摸屏	点击触摸屏测试点画面无转换不允许		重缺陷

12. Precaution

12.1 Handling

- (1) Protect the panel from static, it may cause damage to the CMOS Gate Array IC.
- (2) Use fingerstalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
- (3) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.
- (4) The desirable cleaners are water, IPA (Isopropyl Alcohol) or Hexane. Don't use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.

(5) Pins of I/F connector shall not be touched directly with bare hands.

(6) Refrain from strong mechanical shock and / or any force to the panel. In addition to damage, this may cause improper operation or damage to the panel.

(7) Note that polarizers are very fragile and could be easily damaged. Do not press or scratch the surface harder than a B pencil lead.

(8) Wipe off water droplets or oil immediately. If you leave the droplets for a long time, staining and discoloration may occur.

(9) If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.

12.2 Storage

(1) Do not leave the panel in high temperature, and high humidity for a long time. It is highly recommended to store the panel with temperature from 0 to 35°C and relative humidity of less than 70%.

(2) The panel shall be stored in a dark place. It is prohibited to apply sunlight or fluorescent light during the store.

12.3 Operation

(1) The LCD shall be operated within the limits specified. Operation at values outside of these limits may shorten life, and/or harm display images.

(2) Do not exceed the absolute maximum rating value. (the supply voltage variation, Input voltage variation in part contents and environmental temperature and so on).Otherwise the panel may be damaged.

(3) If the panel displays the same pattern continuously for a long period of time, it can be the situation when the image" Sticks" to the screen.