SPECIFICATION

NO.:PJ7003I04-35H50P350

ACCEPTED BY CUSTOMER	

Product: 7.0” TFT 800(RGB)*480 Pixels

Version: V00

Date: 2016-06-27

APPROVED	CHECKED	PREPARED

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Catalog:

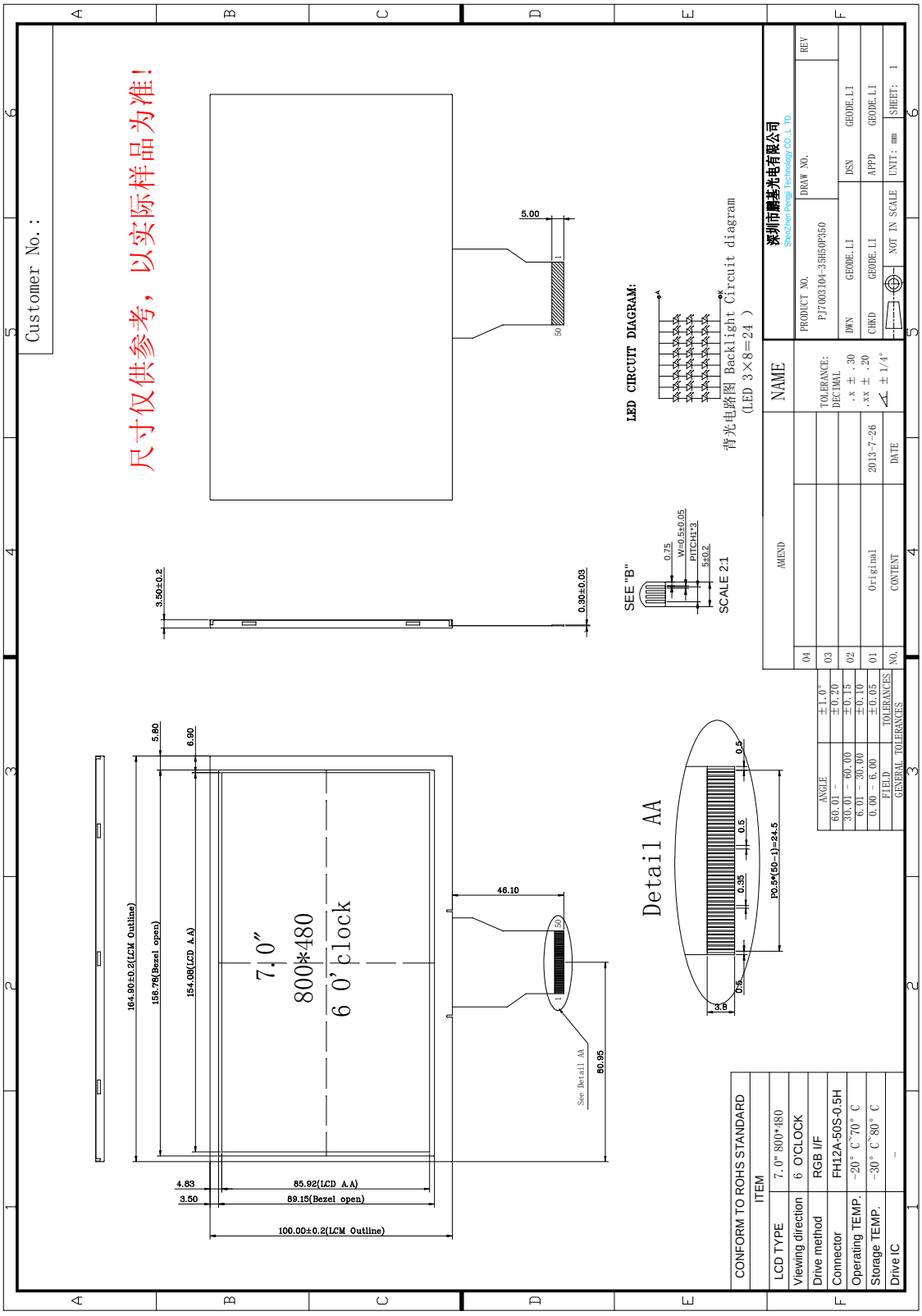
1. History Verson

Sample version	Doc. version	Date	Description	Modify
V00	V00	2016-06-27	First issue	LW

2. Mechanical Description

Name	Content	Unit
Outline Size	164.90 (W) * 100.00 (H) * 3.5(T)	mm
Module size	7.0 (A.A)	inch
Resolution	800(RGB)* 480 Pixels	-
Viewing size	154.08(W) * 85.92(H)	mm
Pixel size	0.179 * 0.179	mm
LCD Type	TFT (16.7M)/ Transmissive	-
Viewing Angle	6 O’ clock	-
Driver IC	-	-
Backlight Type	3 Serial 8 Parallel LEDs	-
Interface Type	24 Bit RGB	-

3. Mechanical Drawing



4. Interface Definition

PIN NO.	PIN Name	Function Description
1	VLED+	Power for LED backlight (Anode)
2	VLED+	Power for LED backlight (Anode)
3	VLED-	Power for LED backlight (Cathode)
4	VLED-	Power for LED backlight (Cathode)
5	GND	Ground
6	VCOM	Common voltage
7	DVDD	Power for Digital Circuit
8	MODE	DE/SYNC mode select
9	DE	Data Input Enable
10	VS	Vertical Sync Input
11	HS	Horizontal Sync Input
12-19	B7-B0	Blue data
20-27	G7-G0	Green data
28-35	R7-R0	Red data
36	GND	Power Ground
37	DCLK	Sample clock
38	GND	Ground
39	L/R	Left/right selection
40	U/D	Up/down selection
41	VGH	Gate ON Voltage
42	VGL	Gate OFF Voltage
43	AVDD	Power for Analog Circuit
44	RESET	Global reset pin.
45	NC	No connection
46	VCOM	Common Voltage
47	DITHB	Dithering function
48	GND	Power Ground
49	NC	No connection
50	NC	No connection

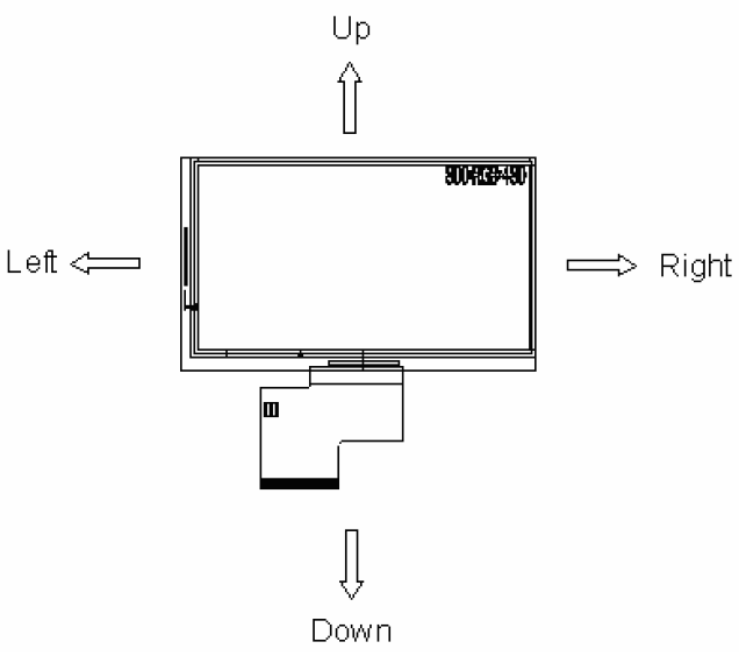
Note 1: DE/SYNC mode select. Normally pull high.
When select DE mode, MODE="1", VS and HS must pull high.
When select SYNC mode, MODE= "0", DE must be grounded.
Note 2: When input 18 bits RGB data, the two low bits of R,G and B data must be grounded.

Note 3: Data shall be latched at the falling edge of DCLK.

Note 4: Selection of scanning mode

Setting of scan control input		Scanning direction
U/D	L/R	
GND	DVDD	Up to down, left to right
DVDD	GND	Down to up, right to left
GND	GND	Up to down, right to left
DVDD	DVDD	Down to up, left to right

Note 5: Definition of scanning direction.
Refer to the figure as below:

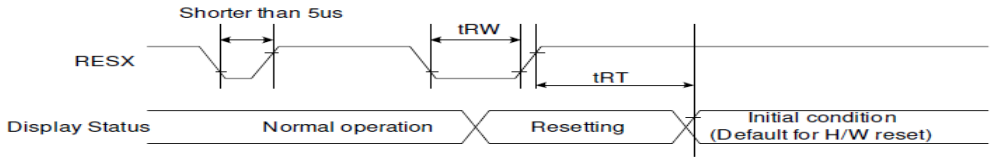


Note 6: Global reset pin. Active low to enter reset state. Suggest to connect with an RC reset circuit for stability. Normally pull high.

Note 7: Dithering function enable control, normally pull high.
When DITHB=”1”,Disable internal dithering function,
When DITHB=”0”,Enable internal dithering function,

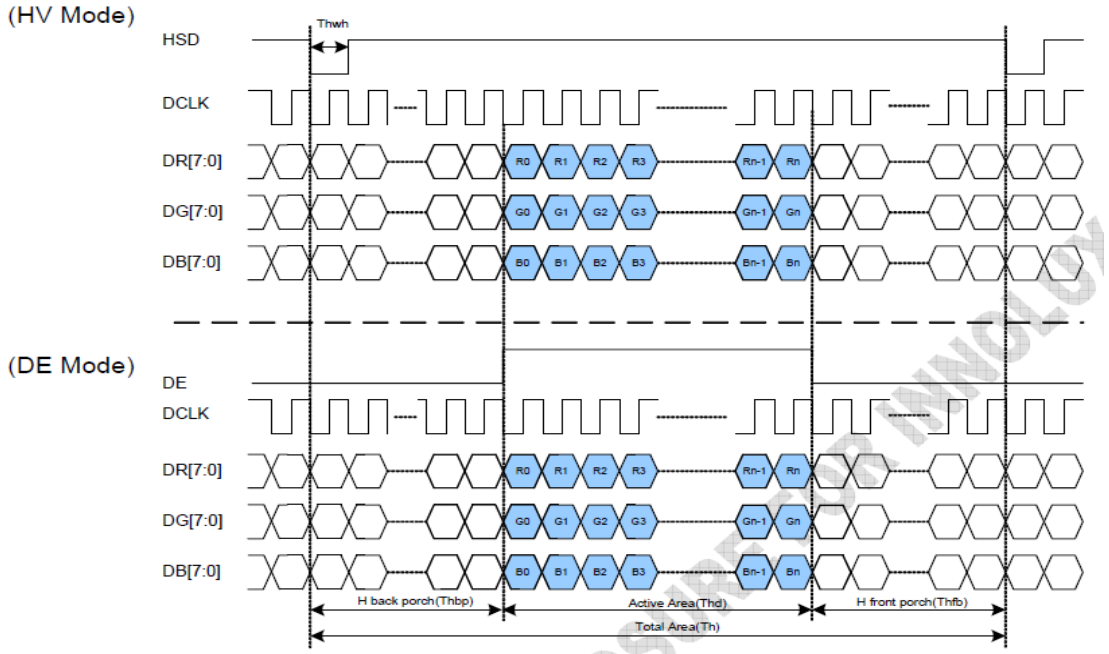
5. Interface Timing：

5.1 Reset Timing



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

5.2 RGB Interface Timing



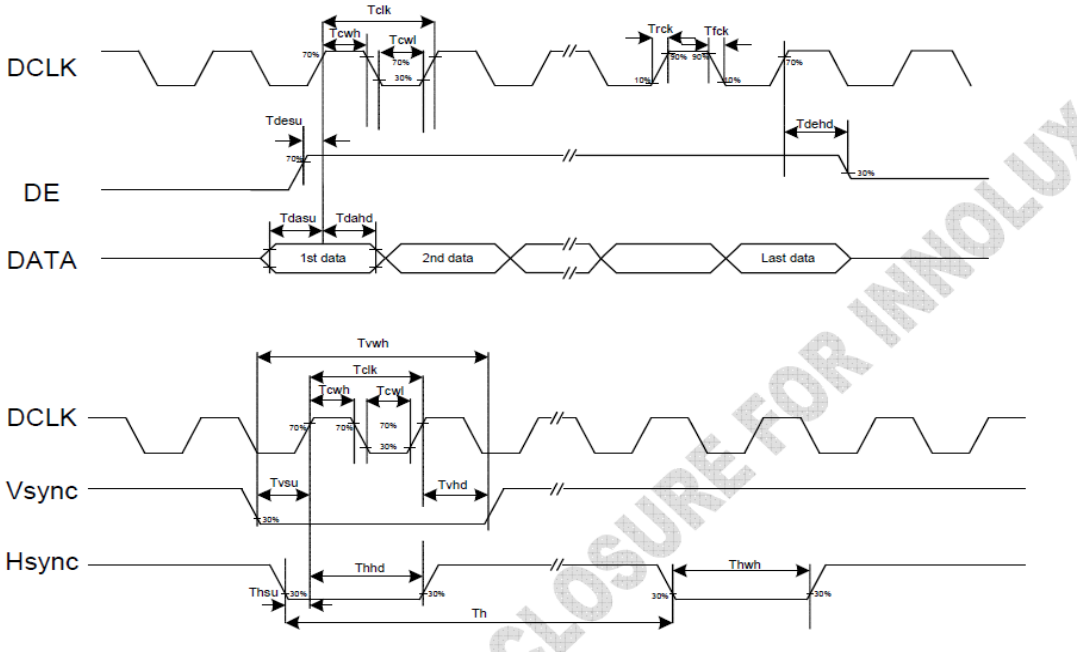
Horizontal timing

Parameter	Symbol	Min.	Typ.	Max	Unit	Note
Horizontal Display Area	thd	-	800	-	DCLK	
DCLK frequency	fclk	-	30	50	MHz	
One Horizontal Line	th	889	928	1143	DCLK	
HS pulse width	thpw	1	48	255	DCLK	
HS Back Porch(Blanking)	thbp		88		DCLK	
HS Front Porch	thfp	1	40	255	DCLK	
DE Mode Blanking	th-thd	85	128	512	DCLK	

Vertical timing

Parameter	Symbol	Min.	Typ.	Max	Unit	Note
Vertical Display Area	tvd	-	480	-	th	
VS period time	tv	513	525	767	th	
VS pulse width	tvpw	3	3	255	th	
VS Back Porch(Blanking)	tvbp		32		th	
VS Front Porch	tvfp	1	13	255	th	
DE Mode Blanking	tv-tvd	4	45	255	th	

5.3 AC Timing Diagram



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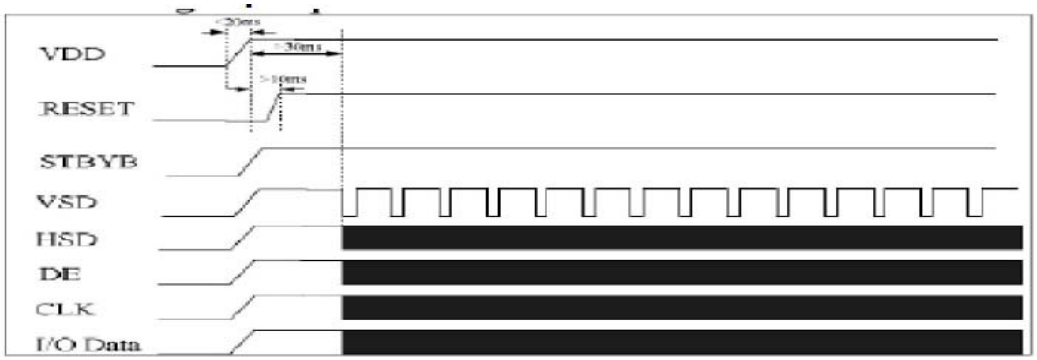
Parameter	Symbol	Spec.			Unit
		Min.	typ.	Max.	
HS setup time	T_{hst}	8	-	-	ns
HS hold time	T_{hhd}	8	-	-	ns
VS setup time	T_{vst}	8	-	-	ns
VS hold time	T_{vhd}	8	-	-	ns
Data setup time	T_{dsu}	8	-	-	ns
Data hold time	T_{dhd}	8	-	-	ns
DE setup time	T_{esu}	8	-	-	ns
DE hold time	T_{ehd}	8	-	-	ns
VDD Power On Slew rate	T_{POR}	-	-	20	ms
RSTB pulse width	T_{Rst}	10	-	-	us
CLKIN cycle time	T_{cph}	20	-	-	ns
CLKIN pulse duty	T_{cwh}	40	50	60	%
Output stable time	T_{sst}	-	-	6	us

5.4 Power sequence



6. Absolute Maximum Ratings：

Name	symbol	Min	Type	Max	Unit
Operation Temperature	TOP	-20	-	70	℃
Storage Temperature	TST	-30	-	80	℃

7. DC Characteristics

Name	Symbol	Min	Type	Max	Unit
Logical Voltage	VDD	3.0	3.3	3.6	V
Input High Voltage	VIH	0.8IOVCC	-	IOVCC	V
Input Low Voltage	VIL	-0.3	-	0.2IOVCC	V
Output High Voltage	VOH	0.8IOVCC	-	-	V
Output Low Voltage	VOL	-	-	0.2IOVCC	V
Current Consumption	IDD	-	-	25	mA

8. Blacklight：

Name	Min	Type	Max	Unit
Current	120	160	200	mA
Voltage	8.4	9.3	10.2	V
Power Consumption	-	1488	-	mW
luminance	300	350	-	CD/M^2 (Note1) (ST-86LA)
Luminance uniformity	75%	80%	-	(Note2)
X Color Coordinates	-	-	-	-
Y Color Coordinates	-	-	-	-

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.

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

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

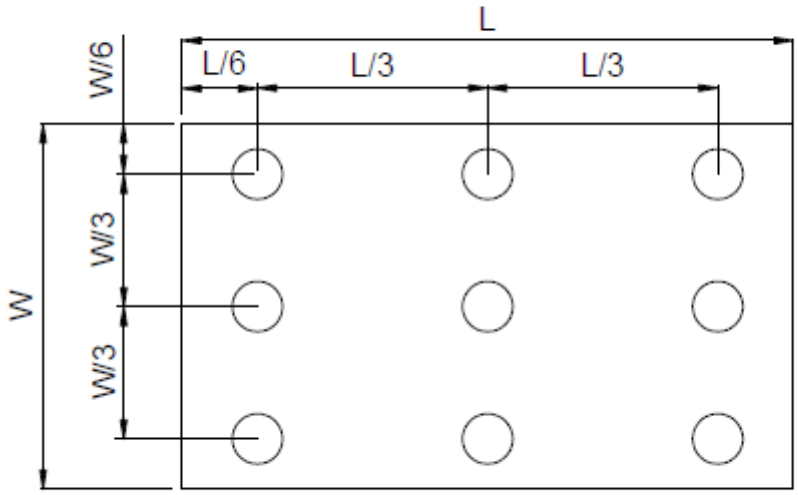


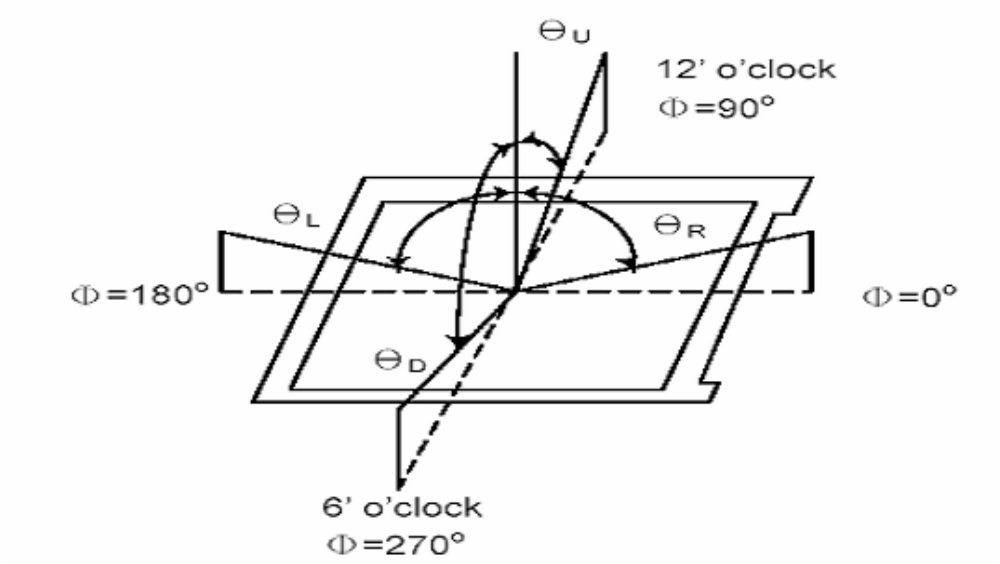
Fig. 4-4 Definition of measuring points

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	-	45	-	ms
Viewing Angle	θ U	40	50	-	degree (C/R>10)
	θ D	60	70	-	
	θ L	60	70	-	
	θ R	60	70	-	

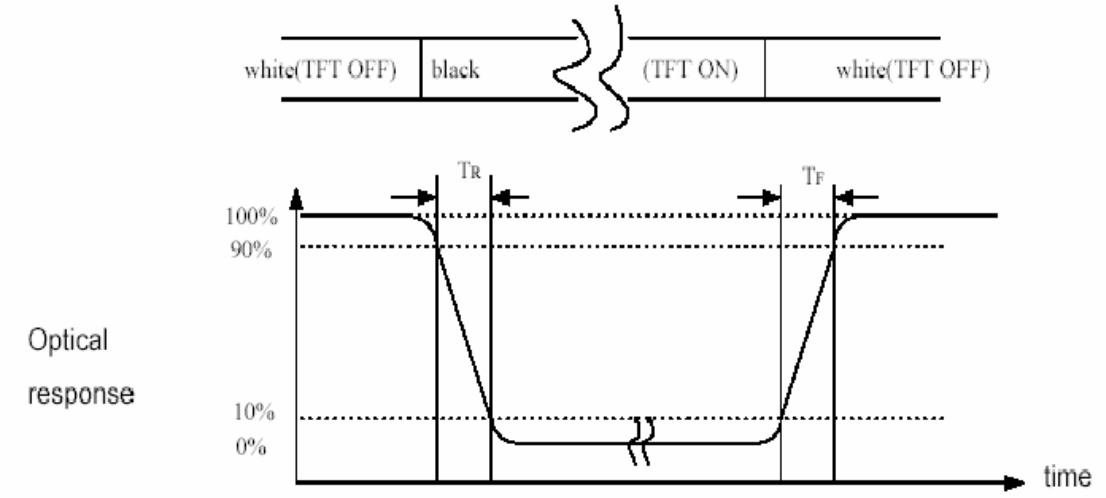
*Viewing angle descriptin:



*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

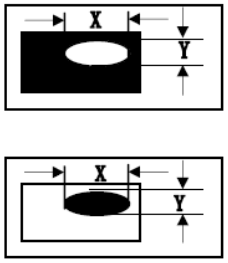
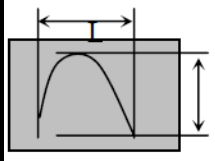
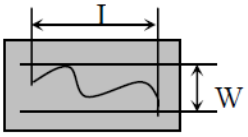
11. Inspection Standard

11.1 Defect Defination

No.	Defect Class	Defination	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

<table>
<tr><th>No.</th><th>Item</th><th colspan="3">Inspection Standard</th><th>Classification of defects</th></tr>
<tr><td rowspan="6">3</td><td rowspan="6">显示黑点
白点
针孔</td><td>直径（Φ=（X+Y）/2）</td><td>允收数</td><td>图示</td><td rowspan="6">轻缺陷</td></tr>
<tr><td>Φ≤0.1 （密集不可）</td><td>不计</td><td rowspan="5"> 
</td></tr>
<tr><td>0.1<Φ≤0.15［注2］</td><td>2</td></tr>
<tr><td>0.15<Φ≤0.2</td><td>1</td></tr>
<tr><td>Φ>0.2</td><td>0</td></tr>
<tr><td colspan="3">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。</td></tr>
<tr><td rowspan="5">4</td><td rowspan="5">显示黑线
白线</td><td>尺 寸（L：线长；W：线宽）</td><td>允收数</td><td>图示</td><td rowspan="5">轻缺陷</td></tr>
<tr><td>L 不计 W<0.03（密集不可）</td><td>不计</td><td rowspan="3"> 
  </td></tr>
<tr><td>L≤2 0.03≤W≤0.05［注 2］</td><td>2</td></tr>
<tr><td>L 不计 W>0.05</td><td>以点判断</td></tr>
<tr><td colspan="3">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。</td></tr>
<tr><td>5</td><td>触摸屏</td><td colspan="2">点击触摸屏测试点画面无转换不允许</td><td></td><td>重缺陷</td></tr>
</table>

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℃ 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.