

## SPECIFICATION FOR LCD SAMPLE

### LCD 样品确认书

Model No.

型 号

GD-042AP

Sample No.

样品编号

A-01

Customer

客 户

XMO

DATE DELIVERED

呈交日期

2017-1-5

APPROVAL SIGNATURE&CHOP	
供应商核准签章	
Prepared By 拟 制	
Checked By 审 核	
Approved By 批 准	

CUSTOMER APPROVAL SIGNATURE&CHOP	
客户核准签章	
Prepared By 拟 制	
Checked By 审 核	
Approved By 批 准	

# XIAMEN OCULAR OPTICS CO.,LTD

## SPECIFICATION FOR LCD

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### 2. BASIC FEATURES      基本特性

2.1 Driving Mode:    Static            Dynamic  
                                                        
                                  驱动方式:        静态                动态

2.2 Display Type        TN            HTN            STN            FSTN  
                                                                                                
                                  显示类型:        TN                HTN                STN                FSTN

2.3 Display Mode: Positive    Negative    Yellow-Green    Grey    Blue    White/Black  
 Other  
                                                                                                                                                            
                                  显示方式:        白底黑字    黑底白字    黄绿模    灰模    蓝模    黑白模    其他

2.4 Polarizer Mode: Reflective    Transflective    Transmissive    Hight Transflective  
                                                                                                
                                  偏光片类型:        反射片            半透片            全透片            高半透片

2.5 Viewing direction: 3H            6H            9H            12H            OTHETR  
                                                                                                                    
                                  视向:                3点钟            6点钟            9点钟            12点钟            其他

2.6 LCD Type :        COB            COG            TAB            OTHER  
                                                                                                
                                  LCD 类型:        COB                COG                TAB                其他

2.7 Connector:        Rubber        Heat Seal        Pin            OTHER  
                                                                                                
                                  连接方式:        斑马条            热压纸            针脚            其他

2.8 Other:            Drilling        Cutting Corner        Edge-grinding        Ink  
                                                                                                
                                  其他:                钻孔                磨角                磨边                油墨

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### Drive Conditions and Display Characteristics 驱动条件和显示特性

Parameter 参数	Vop 操作电压	Duty 占空比	Bias 偏压	Display model 显示类型	Illumination model 偏光类型	Image model 显示方式	Viewing direction 视角	Remark 注释
Ratings 范围	3.0V	STATIC	1/2	TN	<b>Reflective</b>	<b>Positive</b>	6:00	

### Absolute Maximum Ratings 绝对最大范围

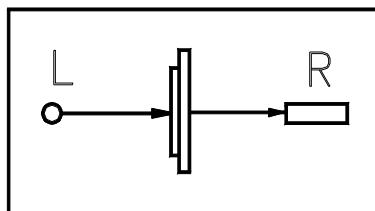
Parameter 参数	Ratings 范围		Unit 单位	Remarks 注释
	Min 最小值	Max 最大值		
AC applied voltage 最大交流电压	—	7	V	
DC applied voltage 最大直流电压	—	7	V	
Operating temp. Range 工作温度范围	-20	70	°C	
Storage temp. Range 存储温度范围	-30	80	°C	

### 3. NOTE 注释

#### 3.1 Reference of Electro-optical measuring 相关测量

##### 3.1.1 Optical measuring system 光测量系统

#### Transmissive type 反射类



(The front polarizer is “transmissive”, The back polarizer is “**Reflective**” )

(正面偏光片是全透，背面是反射)

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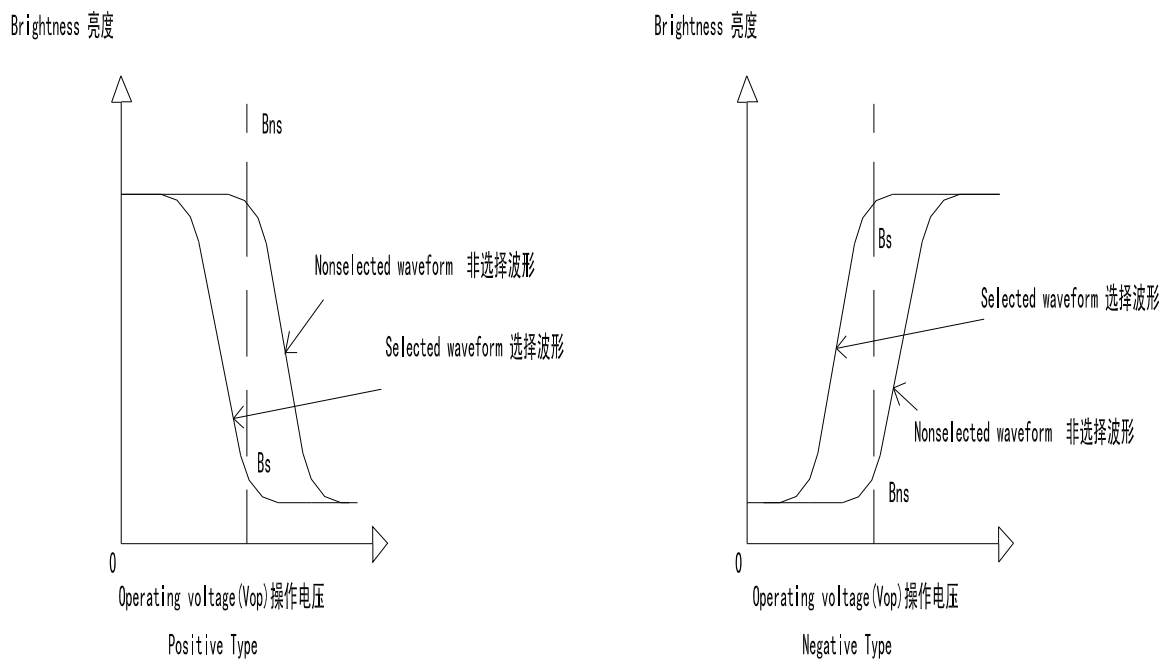
L: Light source R: Luminance receiver

L: 光源 R: 光接收器

Note: For transfective product, if customer no special request, we measure it using "B" system.

注释: 对于半透型产品, 如客户无专门要求, 一般我们都采用 B 系统测试

### 3.1.2 Definition of Operation Voltage (Vop) 操作电压的定义



Operation Voltage 操作电压(Vop): Voltage which maximum Contrast ratio can be given on the

Above condition.

在上面条件下获得最大对比度的电压为操作电压。

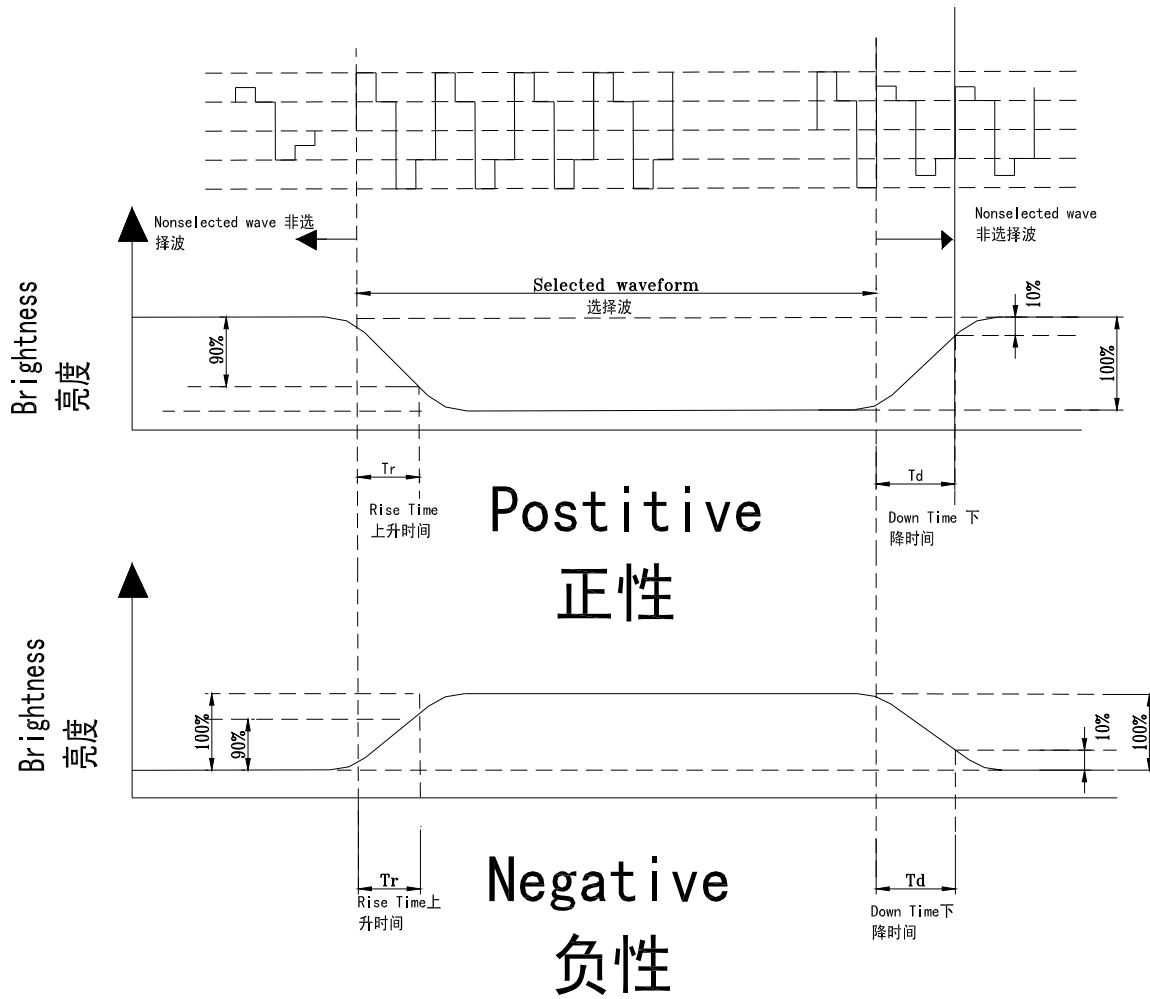
Conditions 条件:

Temperature 温度: See Individual Specification. 见规格书

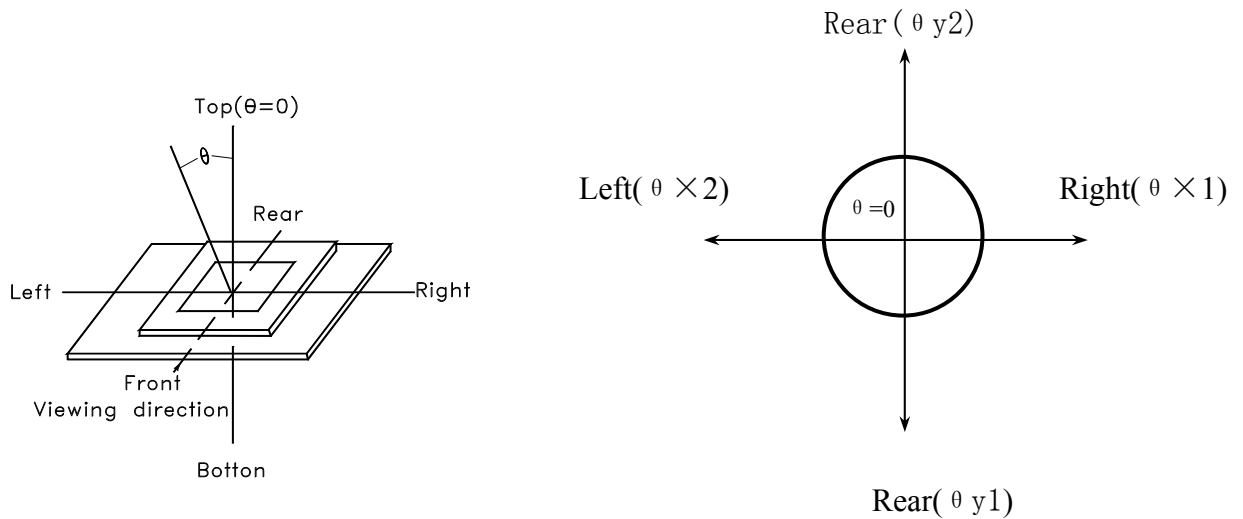
Measureing Angle 测试角度: See Individual Specification. 见规格书

Driving Frequency Typical Value in Individual Specification. 见规格书

3.1.3 Definition of response time 响应时间的定义 (Tr,Td)

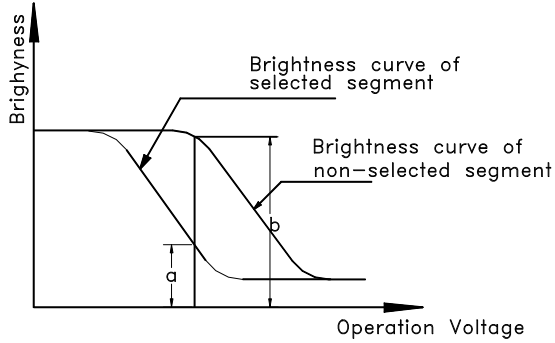


3.1.4 Definition of viewing angle 视角的定义



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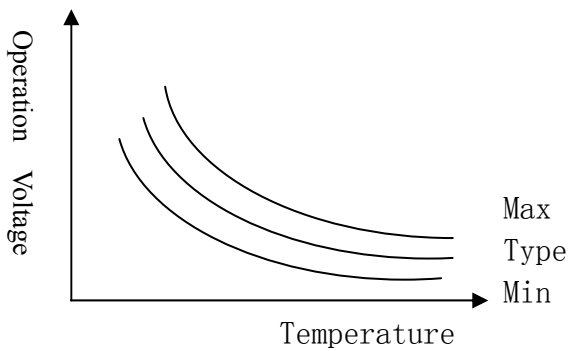
## 3.1.5 Definition of contrast 对比度的定义



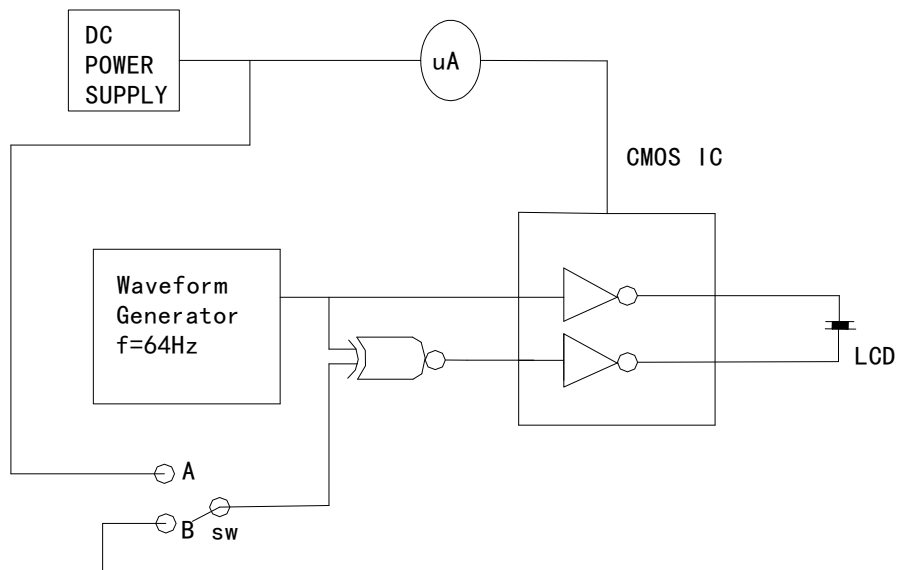
$$Cr = \frac{\text{Brightness of non - selected state}}{\text{Brightness of selected state}} = b / a$$

Front(θ y1)

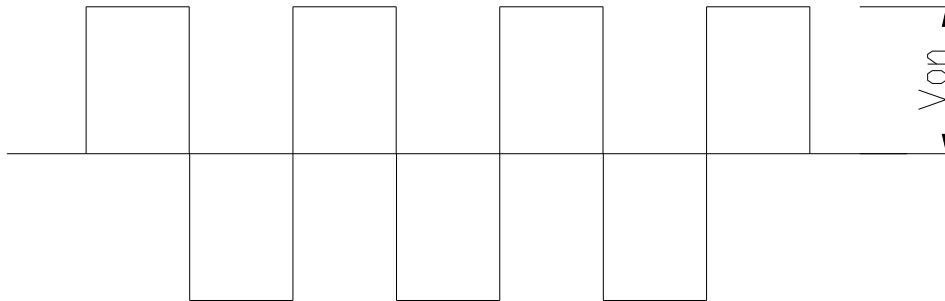
## 3.1.6 Vop & temperature curves 操作电压与温度的相关曲线



## 3.1.7 Current Consumption Measuring 电流的测量 Instruments 设备



Driving Waveform 驱动波形



Conditions 条件:

Operation Frequency 操作频率: 64HZ

Von:Selected Voltage 选择电压

3.1.8 Capacitance 电容 (c) :

Measuring Method of  
Capacitance  
电容的测量方法



Conditions 条件:

Temperature 温度: 25℃

Driving waveform 驱动波形: 1KHz,sine wave,1.0Vrms.1KHz 正弦波, 1.0Vrms

Voltage applied to all segments 所有 Seg 电极加电压。



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### 4. Electro-optical quality characteristics      光电特性

Item 项目	Symbol 符号	Temp°C 温度	Condition 条件	Min 最小值	Type 平均值	Max 最大值	Unit 单位	Reference 注明
Operating Voltage 操作电压	Vop	0	$\theta = 0$ Cr:max	3.0	3.1	3.2	V	3.1.2
		25		2.9	3.0	3.1		
		50		2.8	2.9	3.0		
Frame frequency 帧频	f	25	----	60		200	Hz	3.1.2
Response Time 响应时间	Tr 上升	0	$\theta = 0$ Vop=3.0v	--	600		msec	3.1.3
	Td 下降			--	450			
	Tr 上升	25	$\theta = 0$ Vop=3.0v	--	100			
	Td 下降			--	80			
Viewing Angle 视向	$\theta_{x1}$	25	Vop=3.0v	35	--	--	deg	3.1.4
	$\theta_{x2}$			35	--	--		
	$\theta_{y1}$			45	--	--		
	$\theta_{y2}$			15	--	--		
Contrast 对比度	Cr	25	$\theta_{Y1}=45$ Vop=3.0v	$\cong 2$	--	--		3.1.5
			$\theta_{Y2}=15$ Vop=3.0v	$\cong 2$	--	--		
Current Consumption 消耗电流	Ic	25	All segment	--	3	8	$\mu A$	f=64Hz
Capacitance 电容	C	25			9.0		nF	

### 5. Reliability test 可靠性测试

Equipment 仪器: TERCHY 恒温恒湿实验箱      BAKEWARE 烘烤箱  
REFRIGERATOR 冰箱

All of these reliability tests were carried out with polarizers.

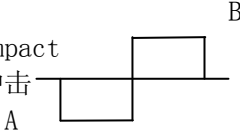
所有的可靠性测试都需要带偏光片。

After the reliability tests, there should be no obvious change about display function, and the test specimen's current should be lower than 200% of prior rating.

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在可靠性测试后，显示功能必须无明显变化，测试样品电流必须比先前的低 200%。

Item 项目	Condition 条件
Expected operation life time 预期工作寿命	50000 Hour
High temperature storage 高温储存	80°C×240Hour
Low temperature storage 低温储存	-30°C×240Hour
High temperature high humidity(storage) 高温高湿度（储存）	40°C×95%RH×500Hour
Cold-Hot rotation impact One cycle 冷热轮流冲击 	A: -20°C×30min B:70°C×30min  Total: 10 cycles

### 6. Application notes: 使用说明

#### 6.1 Safety Instructions 安全说明

The liquid in the LCD should not be swallowed or touched. if it accidentally gets

on your hands, wash them with water.

LCD 中的液晶勿吞食、触摸。如意外碰到手，请即刻用水冲洗。

#### 6.2 Handling Instructions 操作说明

The LCD panel is a glass product developed through precision processing and special orientation treatment. If pressure is applied to the panel, orientation may be disturbed, making it difficult to return to it's original condition, it is apt to be crack or be broken if it is dropped or hit to an external shock.

LCD 面板是通过精密的显影和特殊定向处理的玻璃产品。如果对面板施加压力，液晶的排列将被破坏，很难使其恢复原来的状态。如果 LCD 摔掉或受外力的冲撞，很容易破裂或破损。

#### 6.3 Mounting Instructions 装配说明

a. When connecting a LCD panel to circuit board, it is recommended to use a rubber connector or flexible connector. Direct soldering or mechanical connection is not possible; the pin connected type LCD permits soldering of pins.

当 LCD 面板与电路板连接时，建议使用斑马条或斑马纸连接。不允许直接焊接；装管

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脚的 LCD 产品可以直接焊接。

b. Voltage of driving voltage more higher than the specified voltage will reduce the lifetime of the liquid crystal display panel.

外加驱动电压如果比规定的电压要高很多的话会减少液晶面板的寿命。

C. LCD panels should be handled carefully during shipment. if the terminals are contaminated, wipe off with alcohol.

LCD 面板在装运过程中要小心，如果电极被弄脏，请用酒精清洗。

d. The polarizer must be handled carefully, because it is soft and apt to suffer damage. if a protective panel is attached to the polarizer to avoid damage and contamination, it should be removed just before use as possible.

偏光片必须小心护理，因为它比较柔软，比较易坏。如果有用保护膜保护可以避免损坏和污物，使用时请撕掉保护膜。

e. Use a dry, soft cloth to clean the polarizer, if contamination persists, wipe it off with a small amount of petroleum benzene. Avoid using an organic solvent .

如果偏光片脏了，可以使用干的、柔软的布沾少许石油苯清洁（乙丙醇），勿用有机溶剂。

f. When attaching with the heat seal, wipe off with alcohol before use.

当与斑马纸热压接时，请先使用酒精清洗。

g. The color tone of background on LCD has the possibility to be changed in different temperature range.

LCD 的底背光颜色可能会随温度变化。

### 6.4 Storage Instructions 储存说明

a. Avoid storage in high temperature and high humidity when long-term storage is required keep the panels at a temperature from 10 to 30°C and at a relative humidity of 60% or less.

长期储存时应避免高温、高湿度储存，温度尽量在 0°C 到 30°C 之间，湿度不大于 60%。

b. The LCD unit should be stored in dark place, do not expose it to direct sunlight or fluorescent lamps.

LCD 必须储存在阴暗处，避免阳光直照或荧光灯照射。

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c. Note that the presence of water drops or dew in the LCD panel may deteriorate the polarizer or corrode the electrode.

避免有水滴或水珠在 LCD 面板上，以免损坏偏光片或电极。

### 7. Guarantee 保证

1) The Company warrants the quality of our products for one year (from the date of delivery). If

there are functional defects found during the period of warranty, the defective products would be replaced on a one-to-one basis.

Ocular would not be responsible for any direct/indirect liabilities consequential to an parties.

本产品之保质期为一年（由发货日起计），在保质期内如果发现产品有功能缺陷时，本公司会以一粒换一粒形式补回给顾客。而我司将不会承担任何直接或间接之责任及损失。

2) The company guarantee AQL:Function AQL=0.65, Appearance AQL=1.5.

我司对外承诺的 AQL 值为：功能 AQL=0.65，外观 AQL =1.5。

3) The reject of appearance and function is less than or equal to 2% for the productions of COG.

COG 产品外观及功能不良率  $\leq 2\%$ 。

4) Our products could meet requirements of the environment.

本产品符合环保要求。

### 8. CAUTION 注意事项

1) Fragile glass. Be carefully handle.

易碎，轻拿轻放。

2) Sharp. Be carefully handle.

锐利物，轻拿轻放。

3) Don' t wipe the fragile polarize with hard stuff or any cleansers in case of hurting the polarizer.

不要用硬物或清洁剂擦拭偏光片使她受损。

4) Sensitive to ultraviolet. Avoid used or exposed under sunlight unless it' s applicable to ultraviolet.

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防紫外光损坏。避免在阳光下使用或暴露，除非 LCD 防紫外光。

### 9. LCD INSPECTION CRITERION (LCD 检验规范)

#### 9.1 INSPECTION CONDITION AND METHODS 检验条件及方法

9.1.1 TEMPERATURE: THE TEMPERATURE IN ROOM 温度：室温

9.1.2 LUMINANCE 亮度：

(1) 反射型：用 1×40W 日光灯在 LCD 上方约 60CM 距离；

Reflective: The 1X40W daylight lamp be done above about 60CM away from the LCD

(2) 透过型：用 1×10W 以下的荧光灯置于 LCD 下方 20CM 之内的距离。

Transmiss: Less than 1X10W fluorescent lamp be done below in 20CM away from the LCD

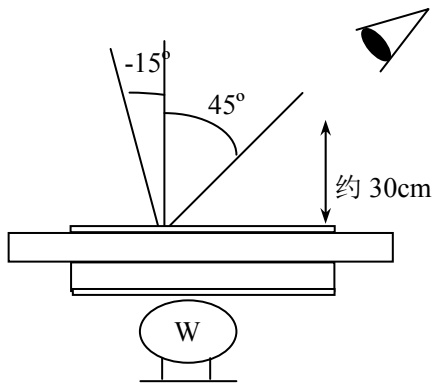
9.1.3 距离：用裸眼距离 LCD30CM 检查；

DISTANCE: THE LCD BE INSPECTED AWAY 30CM FROM EYEBALLS

9.1.4 视角：在 LCD 视察象限角检查视角

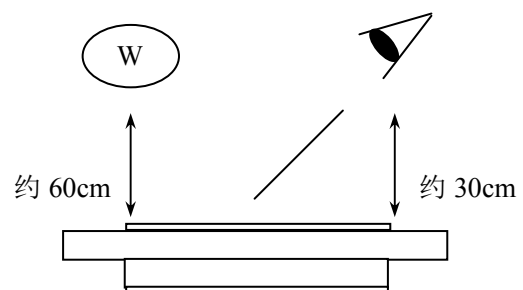
VIEWING ANGLE: BE INSPECTED IN THE VIEWING ANGLE OF THE LCD

9.1.5 检验方法图例：INSPECTION METHOD SUCH AS THE FIGURES AS FOLLOWING:



图一(FIGURE 1)

透射型产品 TRANSMISS PRODUCTS



图二(FIGURE 2)

反射型产品 REFLECTIVE

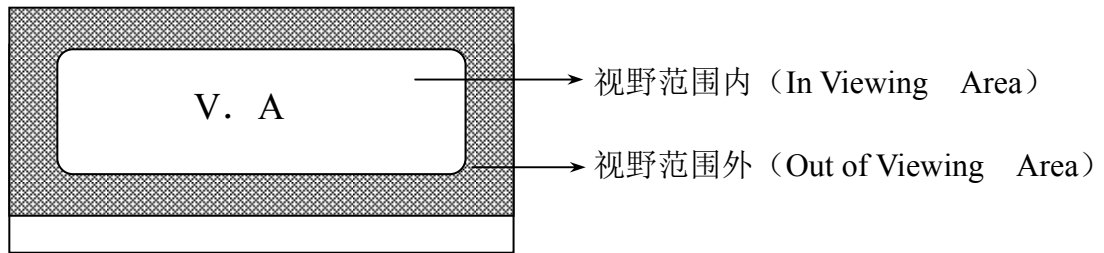
PRODUCTS

9.1.6 VIEWING AREA 视野范围(视区 V.A)

(1) 定义：LCD 装机后可以目视到的区域：

DEFINITION: COULD BE SEEN BY EYEBALLS ATTER THE LCD BE INSTALLED

(2) 图例(SUCH AS THIS FIGURE AS FOLLOWING):



图三 (FIGURE 3)

9.2 INSPECTION SPECIFICATION 检验规格:

9.2.1 尺寸检验规格: 超出工程图尺寸公差拒收;

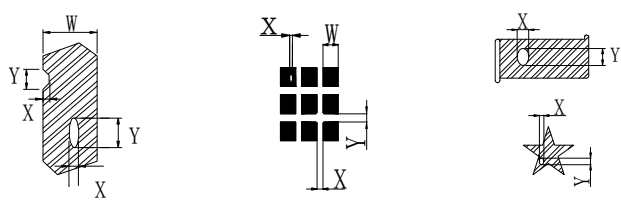
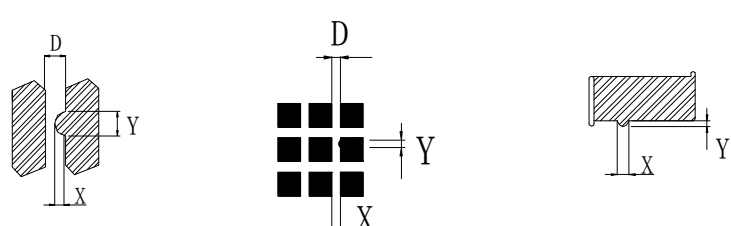
INSPECTION SPECIFICATION OF THE DIMENSION: OVER THE TOLERANCE OF THE ENGINEERING DRAWING IS REJECT

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9.2.2 THE SPECIFICATION OF THE FUNCTION INSPECTION 功能检测规格(单位 UNIT: mm)

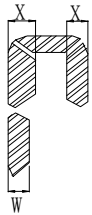
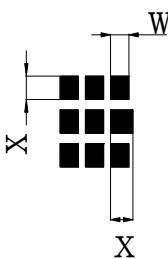
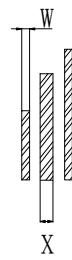
NO.	项 目 Item	规 格 Criteria	缺陷 定 义 Defect Definition
1	多划，少 (缺)划 Excrescent Row, Lack Row	拒收 Reject	主缺 Major Defect
2	显示暗划 Display the hidden row	拒收或依限度样品 Reject or according to the end samples	主缺 Major Defect
3	短路 Short	上下(TB)短路和线间(同面)短路拒收 Top or bellow short and the lines in one side short is reject	主缺 Major Defect
4	导通不良 Conductance defect	拒收 Reject	主缺 Major Defect
5	视角错误 View angle defect	拒收 Reject	主缺 Major Defect
6	显示深浅不 一 Inconsistent viewing area	拒收或依限度样品 Reject or according to the end samples	主缺 Major Defect

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7	<p>针孔, 变形 Pin Hole, Distortion</p>	<p><b>7.1 针孔及凹变形(含外观不良形成的类似针孔缺陷):</b>  <b>Pin Hole and Concave Distortion (including the appearance defect form the similar pin hole)</b></p> <p>笔段型 Character    点阵型 Dot Matrix    图案型 Graphic</p>  <p align="center"><math>\Phi = (X+Y) / 2</math></p> <table border="1" data-bbox="470 728 1273 1019"> <thead> <tr> <th>宽度 (W) Width</th> <th>尺寸 <math>\Phi</math> Dimension</th> <th>允许个数 Acceptable number</th> </tr> </thead> <tbody> <tr> <td>不限 No limit</td> <td><math>\Phi &lt; 0.10</math></td> <td>无视(密集不可) Ignore (Concentrate is not acceptable)</td> </tr> <tr> <td><math>W \leq 0.4</math></td> <td><math>\Phi \leq 0.20</math> 且 <math>X \leq 1/2W</math></td> <td>3</td> </tr> <tr> <td><math>W &gt; 0.4</math></td> <td><math>\Phi \leq 0.25</math> 且 <math>X \leq 1/3W</math></td> <td>3</td> </tr> </tbody> </table> <p>注 Note: (1)密集定义: 直径 5mm 的圆内, 缺点个数超过 5 个;          Concentrate definition: If the diameter of the round is 5mm, the defect number over 5 Entries          (2)总允许针孔个数为 3 个, 两点间距必须大于 10mm。          Total pin hole 3 is acceptable, and distance between two dots must <math>\geq 10\text{mm}</math></p>	宽度 (W) Width	尺寸 $\Phi$ Dimension	允许个数 Acceptable number	不限 No limit	$\Phi < 0.10$	无视(密集不可) Ignore (Concentrate is not acceptable)	$W \leq 0.4$	$\Phi \leq 0.20$ 且 $X \leq 1/2W$	3	$W > 0.4$	$\Phi \leq 0.25$ 且 $X \leq 1/3W$	3	<p>次缺 Minor Defect</p>
宽度 (W) Width	尺寸 $\Phi$ Dimension	允许个数 Acceptable number													
不限 No limit	$\Phi < 0.10$	无视(密集不可) Ignore (Concentrate is not acceptable)													
$W \leq 0.4$	$\Phi \leq 0.20$ 且 $X \leq 1/2W$	3													
$W > 0.4$	$\Phi \leq 0.25$ 且 $X \leq 1/3W$	3													
		<p><b>7.2 凸变形 Protruding Distortion</b></p> <p>笔段型 Character    点阵型 Dot Matrix    图案型 Graphic</p>  <p><b>D: 间距 Distance</b>                      <math>\Phi = (X+Y) / 2</math></p>	<p>次缺 Minor Defect</p>												



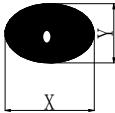
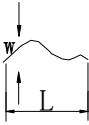
**XIAMEN OCULAR OPTICS CO.,LTD**  
**SPECIFICATION FOR LCD**

NO.	项 目 Item	规 格 Criteria	次缺 Minor Defect																						
7	针孔、变形 Pin Hole, Distortion	<table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <th style="width: 50%;">尺寸 <math>\Phi</math></th> <th style="width: 50%;">允许个数 Acceptable number</th> </tr> <tr> <td style="text-align: center;"><math>\Phi &lt; 0.15</math></td> <td style="text-align: center;">无视 Ignore</td> </tr> <tr> <td style="text-align: center;"><math>\Phi \leq 0.20</math> 且 <math>X \leq 1/2D</math></td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;"><math>\Phi &gt; 0.25</math> 或 <math>X &gt; 1/2D</math></td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">当 <math>Y &gt; 0.50</math> 按整体变形 When Y is larger than 0.50, it's the whole distortion.</td> <td style="text-align: center;">-</td> </tr> </table> <p>注 Note: 总允许凸变形个数为 3 个 Protruding distortion of the number of 3 in total is acceptable.</p> <p>7.3 整体变形 Whole Distortion(变粗或变细 become thick or thin)</p> <p style="text-align: center;">笔段型 Character    点阵型 Dot Matrix    图案型 Graphic</p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 33%;">宽度 Width (W)</th> <th style="width: 33%;">变形宽度 X Distortion width</th> <th style="width: 33%;">允许个数 Acceptable number</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">不限 No limit</td> <td style="text-align: center;"><math> X-W  \leq 0.15</math></td> <td style="text-align: center;">无视 Ignore</td> </tr> <tr> <td style="text-align: center;"><math>W \leq 4\text{mm}</math></td> <td style="text-align: center;"><math> X-W  \leq 0.25</math> 且 <math>X \geq 1/2W</math></td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;"><math>W &gt; 4\text{mm}</math></td> <td style="text-align: center;"><math> X-W  \leq 0.40</math></td> <td style="text-align: center;">3</td> </tr> </tbody> </table> <p>注 Note: (1) 总允许整体变形数为 3 处 Whole distortion of the number of 3 in total is acceptable; (2) 变粗不能超过正常情况该图形与相邻图形间距的 1/2 Become thick couldn't over 1/2 of the distance between figure and the near figure in natural case</p>	尺寸 $\Phi$	允许个数 Acceptable number	$\Phi < 0.15$	无视 Ignore	$\Phi \leq 0.20$ 且 $X \leq 1/2D$	3	$\Phi > 0.25$ 或 $X > 1/2D$	0	当 $Y > 0.50$ 按整体变形 When Y is larger than 0.50, it's the whole distortion.	-	宽度 Width (W)	变形宽度 X Distortion width	允许个数 Acceptable number	不限 No limit	$ X-W  \leq 0.15$	无视 Ignore	$W \leq 4\text{mm}$	$ X-W  \leq 0.25$ 且 $X \geq 1/2W$	3	$W > 4\text{mm}$	$ X-W  \leq 0.40$	3	次缺 Minor Defect
尺寸 $\Phi$	允许个数 Acceptable number																								
$\Phi < 0.15$	无视 Ignore																								
$\Phi \leq 0.20$ 且 $X \leq 1/2D$	3																								
$\Phi > 0.25$ 或 $X > 1/2D$	0																								
当 $Y > 0.50$ 按整体变形 When Y is larger than 0.50, it's the whole distortion.	-																								
宽度 Width (W)	变形宽度 X Distortion width	允许个数 Acceptable number																							
不限 No limit	$ X-W  \leq 0.15$	无视 Ignore																							
$W \leq 4\text{mm}$	$ X-W  \leq 0.25$ 且 $X \geq 1/2W$	3																							
$W > 4\text{mm}$	$ X-W  \leq 0.40$	3																							
8	其 它 Other	其它功能检验时明显可见的外观不良参照外观检验规格。 If there is evident appearance defect when they are other function inspection, please refer to The Appearance Inspection Criteria!																							

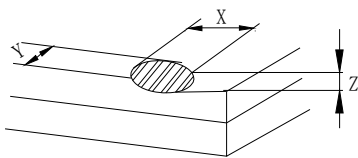
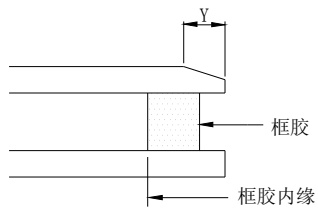
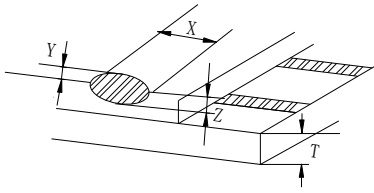
# XIAMEN OCULAR OPTICS CO.,LTD

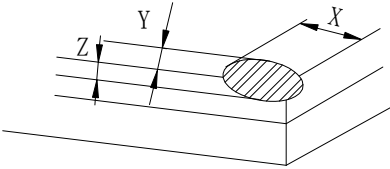
## SPECIFICATION FOR LCD

### 9.2.3 外观检测规格 The Appearance Inspection Criteria (单位 Unit: mm)

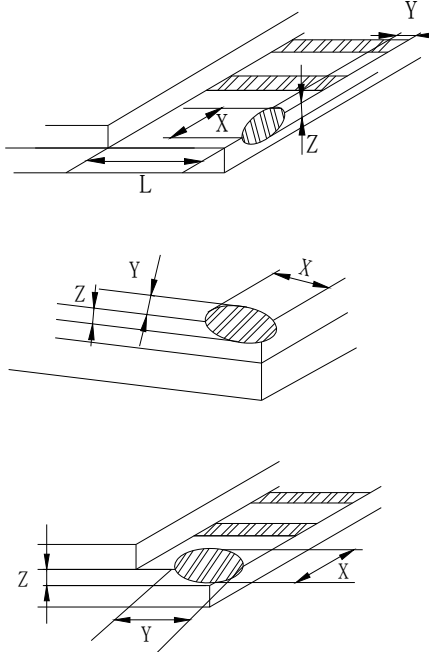
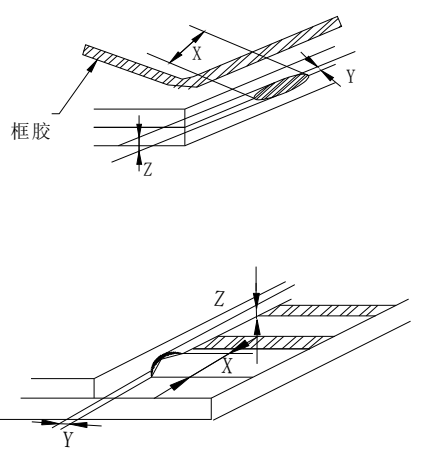
O	项 目 Item	规 格 Criteria	缺陷 定义 Defect Definition														
1	<p>1.1 点状缺陷(圆形状污物,黑点,漏光点,偏反光片等)</p> <p>Dot Defect (Round Dirty spot, Black spot, Leak light spot, Polarize upside down) (V.A 外不计 Outside V.A will be Ignored)</p>	<div style="display: flex; align-items: center;">  <table border="1" style="border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">尺寸Φ Dimension</th> <th style="padding: 5px;">允许个数 Acceptable Number 普通方式 General Mode</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"><math>\Phi \leq 0.10</math></td> <td style="padding: 5px;">无视 Ignore</td> </tr> <tr> <td style="padding: 5px;"><math>0.10 &lt; \Phi \leq 0.20</math></td> <td style="padding: 5px;">2</td> </tr> <tr> <td style="padding: 5px;"><math>0.20 &lt; \Phi \leq 0.25</math></td> <td style="padding: 5px;">1</td> </tr> </tbody> </table> </div> <p style="margin-top: 10px;"><math>\Phi = (X+Y) / 2</math></p> <p>(1) <math>\Phi \leq 0.10</math> 无视, 但密集不可(密集定义: 直径 5mm 的圆内, 黑点个数超过 5 个)两个点状物间距必须大于 10mm。 If <math>\Phi \leq 0.10</math>, it will be ignored, But, concentrate is not acceptable, (Concentrate definition: If the diameter of the round is 5mm, the defect number over 5 Entries) and distance between two dots must <math>\geq 10\text{mm}</math></p>	尺寸Φ Dimension	允许个数 Acceptable Number 普通方式 General Mode	$\Phi \leq 0.10$	无视 Ignore	$0.10 < \Phi \leq 0.20$	2	$0.20 < \Phi \leq 0.25$	1	<p>次缺 Minor Defect</p>						
尺寸Φ Dimension	允许个数 Acceptable Number 普通方式 General Mode																
$\Phi \leq 0.10$	无视 Ignore																
$0.10 < \Phi \leq 0.20$	2																
$0.20 < \Phi \leq 0.25$	1																
	<p>1.2 线状缺陷(纤维、玻璃和偏光片刮伤, 黑线, 花痕等)</p> <p>Line Defect (Fiber, Glass and Polarizer scratch, Black line, Crack (V.A 外不计 Outside V.A will be Ignored)</p>	<div style="display: flex; align-items: center;">  <table border="1" style="border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">长(L) Length</th> <th style="padding: 5px;">宽(W) Width</th> <th style="padding: 5px;">允许个数 Acceptable Number</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">不限 No limit</td> <td style="padding: 5px;"><math>W \leq 0.02</math></td> <td style="padding: 5px;">无视 Ignore</td> </tr> <tr> <td style="padding: 5px;"><math>L \leq 3.0</math></td> <td style="padding: 5px;"><math>0.02 \leq W \leq 0.03</math></td> <td rowspan="2" style="padding: 5px;">2</td> </tr> <tr> <td style="padding: 5px;"><math>L \leq 2.0</math></td> <td style="padding: 5px;"><math>0.03 \leq W \leq 0.05</math></td> </tr> <tr> <td style="padding: 5px;">-</td> <td style="padding: 5px;"><math>0.05 &lt; W</math></td> <td style="padding: 5px;">依点状规定 According to the Dot Criteria</td> </tr> </tbody> </table> </div> <p style="margin-top: 10px;">(1) L 是指线状缺陷最长处; L is meaning that the longest of the line defect.</p> <p>(2) 若线状有弯曲来回重复, 则 W 计算所有来回线宽总和; If there is line bending repetition, please use W to calculate the total width of the repetition lines!</p> <p>(3) 两个线状物间距必须大于 10mm。 The distance between two lines must <math>\geq 10\text{mm}</math></p>	长(L) Length	宽(W) Width	允许个数 Acceptable Number	不限 No limit	$W \leq 0.02$	无视 Ignore	$L \leq 3.0$	$0.02 \leq W \leq 0.03$	2	$L \leq 2.0$	$0.03 \leq W \leq 0.05$	-	$0.05 < W$	依点状规定 According to the Dot Criteria	
长(L) Length	宽(W) Width	允许个数 Acceptable Number															
不限 No limit	$W \leq 0.02$	无视 Ignore															
$L \leq 3.0$	$0.02 \leq W \leq 0.03$	2															
$L \leq 2.0$	$0.03 \leq W \leq 0.05$																
-	$0.05 < W$	依点状规定 According to the Dot Criteria															

# XIAMEN OCULAR OPTICS CO.,LTD SPECIFICATION FOR LCD

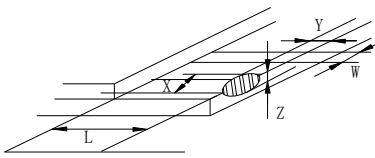
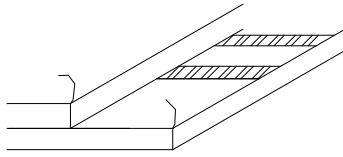
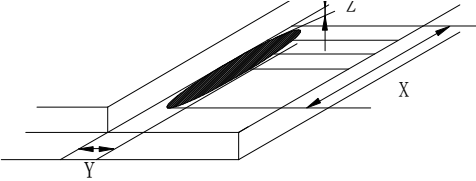
2	2.1 崩缺 Chip out	<p>说明 Explain: (1) 所有崩缺都不可入视野范围; All of the Chip out couldn't in the Viewing Area</p> <p>(2) 崩缺不能触及内部电极线路。 Chip out couldn't in the internal electrode line</p> <p>代号 Code Name: (X: 崩裂长度 Crack Length; Y: 崩裂宽度 Crack Width; Z: 崩裂厚度 Crack thickness; A: LCD 边长 LCD border length W: 电极线宽度 The width electrode line; L: 端子长度 End length; T: 单层玻璃厚度 The thickness of monolayer glass)</p>	
		<p>2.1.1A 表面崩缺(崩同端面)Chip out in the surface(Crack in one side):</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: center; align-items: center; margin-top: 20px;">  </div>	次缺 Minor Defect

NO	项目 Item	规 格 Criteria	缺陷 定义 Defect Definition											
2	2.1 崩缺 Chip out	<div style="display: flex; align-items: center;">  <table border="1" style="margin-left: 20px;"> <thead> <tr> <th style="width: 20%;">X</th> <th style="width: 40%;">Y</th> <th style="width: 40%;">Z</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><math>&gt;1/8A</math></td> <td style="text-align: center;"><math>\leq 0.3\text{mm}</math></td> <td style="text-align: center;"><math>\leq 1/2T</math></td> </tr> <tr> <td rowspan="2" style="text-align: center;"><math>\leq 1/8A</math></td> <td style="text-align: center;">未进入框胶 Not in seal glue</td> <td style="text-align: center;"><math>\leq T</math></td> </tr> <tr> <td style="text-align: center;">未进入框胶内缘 Not inside of seal glue</td> <td style="text-align: center;"><math>\leq 1/2T</math></td> </tr> </tbody> </table> </div>	X	Y	Z	$>1/8A$	$\leq 0.3\text{mm}$	$\leq 1/2T$	$\leq 1/8A$	未进入框胶 Not in seal glue	$\leq T$	未进入框胶内缘 Not inside of seal glue	$\leq 1/2T$	
X	Y	Z												
$>1/8A$	$\leq 0.3\text{mm}$	$\leq 1/2T$												
$\leq 1/8A$	未进入框胶 Not in seal glue	$\leq T$												
	未进入框胶内缘 Not inside of seal glue	$\leq 1/2T$												

# XIAMEN OCULAR OPTICS CO.,LTD SPECIFICATION FOR LCD

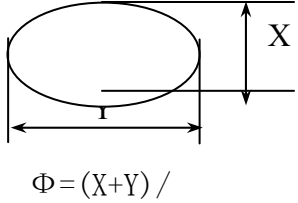
	<p><b>2.1.1 B 表面崩缺(崩电极) Chip out in the surface(Crack in the electrode foot)</b></p>  <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="padding: 5px;">X</th> <th style="padding: 5px;">Y</th> <th style="padding: 5px;">Z</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"><math>&gt;1/8A</math></td> <td style="padding: 5px;"><math>\leq 0.3\text{mm}</math></td> <td style="padding: 5px;"><math>\leq 1/2T</math></td> </tr> <tr> <td style="padding: 5px;"><math>\leq 1/8A</math></td> <td style="padding: 5px;"><math>\leq 1/2L</math></td> <td style="padding: 5px;"><math>\leq T</math></td> </tr> <tr> <td style="padding: 5px;"><math>\leq 1/8A</math> 且 <math>\leq 2\text{mm}</math></td> <td style="padding: 5px;"><math>\leq L</math></td> <td style="padding: 5px;"><math>\leq 1/2T</math></td> </tr> </tbody> </table> <p style="margin-left: 200px;">注：崩缺与电极距离必须大于1个电极 Note: The distance of chip out and electrode should be larger than one electrode.</p>	X	Y	Z	$>1/8A$	$\leq 0.3\text{mm}$	$\leq 1/2T$	$\leq 1/8A$	$\leq 1/2L$	$\leq T$	$\leq 1/8A$ 且 $\leq 2\text{mm}$	$\leq L$	$\leq 1/2T$	<p>次缺 Minor Defect</p>
X	Y	Z												
$>1/8A$	$\leq 0.3\text{mm}$	$\leq 1/2T$												
$\leq 1/8A$	$\leq 1/2L$	$\leq T$												
$\leq 1/8A$ 且 $\leq 2\text{mm}$	$\leq L$	$\leq 1/2T$												
	<p><b>2.1.2 中间崩缺 Chip out in the middle</b></p>  <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="padding: 5px;">X</th> <th style="padding: 5px;">Y</th> <th style="padding: 5px;">Z</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"><math>\leq 1/8A</math></td> <td style="padding: 5px;">未进入框胶 Not in seal glue</td> <td style="padding: 5px;"><math>Z \leq 2T</math></td> </tr> <tr> <td style="padding: 5px;"></td> <td style="padding: 5px;">未进入 1/2 框胶宽度 Not in 1/2 width of seal glue</td> <td style="padding: 5px;"><math>Z \leq 1/2T</math></td> </tr> </tbody> </table>	X	Y	Z	$\leq 1/8A$	未进入框胶 Not in seal glue	$Z \leq 2T$		未进入 1/2 框胶宽度 Not in 1/2 width of seal glue	$Z \leq 1/2T$	<p>次缺 Minor Defect</p>			
X	Y	Z												
$\leq 1/8A$	未进入框胶 Not in seal glue	$Z \leq 2T$												
	未进入 1/2 框胶宽度 Not in 1/2 width of seal glue	$Z \leq 1/2T$												

**XIAMEN OCULAR OPTICS CO.,LTD**  
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NO	项 目 Item	规 格 Criteria	缺陷 定义 Defect Definition												
2	2.1 崩 缺 Chip out	<p>2.1.4 崩电极(含崩角、崩边) Crack the electrode (including the electrode corner or side)</p>  <table border="1" data-bbox="869 481 1321 683"> <tr> <td>X</td> <td>Y</td> <td>Z</td> </tr> <tr> <td>&gt;1/8A</td> <td>≤ 1/5L</td> <td>≤ 1/2T</td> </tr> <tr> <td>≤ 1/8A</td> <td>≤ 1/3L</td> <td></td> </tr> <tr> <td>≤ 1/4W</td> <td>≤ 2/3L</td> <td></td> </tr> </table>	X	Y	Z	>1/8A	≤ 1/5L	≤ 1/2T	≤ 1/8A	≤ 1/3L		≤ 1/4W	≤ 2/3L		次缺 Minor Defect
X	Y	Z													
>1/8A	≤ 1/5L	≤ 1/2T													
≤ 1/8A	≤ 1/3L														
≤ 1/4W	≤ 2/3L														
	2.2 崩 裂 Crack	 <p>(1) 框胶周围裂痕拒收; Around the seal glue is reject (2) 电极处裂痕长度大于 0.5mm 拒收。 The length of crack in the electrode longer than 0.5mm is reject.</p>	次缺 Minor Defect												
	2.3 切 裂不良 Cutting/ Breaking defect	<p>2.3.1 多余边 Superabundance side</p>  <table border="1" data-bbox="901 1142 1321 1377"> <tr> <td>X</td> <td>Y</td> <td>Z</td> </tr> <tr> <td>&gt;1/8A</td> <td rowspan="2">≤ 1/5L</td> <td>≤ 1/2T</td> </tr> <tr> <td>≤ 1/8A</td> <td>1/2T ≤ Z ≤ T</td> </tr> </table>	X	Y	Z	>1/8A	≤ 1/5L	≤ 1/2T	≤ 1/8A	1/2T ≤ Z ≤ T	次缺 Minor Defect				
X	Y	Z													
>1/8A	≤ 1/5L	≤ 1/2T													
≤ 1/8A		1/2T ≤ Z ≤ T													
		<p>2.3.2 端面不平 The side is not even 超出工程图尺寸公差拒收 Over the tolerance of engineering drawing is reject;</p>	次缺 Minor Defect												
3	3.1 偏 / 反光片 Polarizer upside down	<p>偏光片多贴、少贴、错贴拒收; Polarizer more, less or wrong stick is reject</p>	主缺 Major Defect												

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<p>3.2 偏光片气泡 Void in Polarizer (V.A 外不主计 Outside V.A will be Ignored)</p>	 <p style="text-align: center;"><math>\Phi = (X+Y) / 2</math></p> <p>注 Note: 气泡必须无色差影响, 否则按 1.1 点状缺陷计, 且两点间距必须大于 10mm。Air bubble should be in the same color, or will as 1.1mm dot defect, and the distance between the two dots should be larger than 10mm.</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: center;">尺寸Φ Dimension</th> <th style="text-align: center;">允许个数 Acceptable number</th> </tr> <tr> <td style="text-align: center;"><math>\Phi \leq 0.20</math></td> <td style="text-align: center;">无视 Ignore</td> </tr> <tr> <td style="text-align: center;"><math>0.20 \leq \Phi \leq 0.40</math></td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;"><math>0.40 \leq \Phi</math></td> <td style="text-align: center;">0</td> </tr> </table>	尺寸Φ Dimension	允许个数 Acceptable number	$\Phi \leq 0.20$	无视 Ignore	$0.20 \leq \Phi \leq 0.40$	2	$0.40 \leq \Phi$	0	<p>次缺 Minor Defect</p>
尺寸Φ Dimension	允许个数 Acceptable number										
$\Phi \leq 0.20$	无视 Ignore										
$0.20 \leq \Phi \leq 0.40$	2										
$0.40 \leq \Phi$	0										
<p>3.3 偏光片偏位 Polarizer shift from its position</p>	<p>贴片位置超出玻璃边及进入视区拒收。 Polarizer extrudes glass edge and in the viewing area is reject.</p>		<p>次缺 Minor Defect</p>								

NO	项 目 Item	规 格 Criteria	缺陷 定义 Defect Definition
	3.5 保护膜翘起 Protective layer separated from polarizer	<p>(1) 能贴覆的保护膜翘起可接收; 无法贴覆的保护膜翘起, 长边须小于 1/3 边长, 短边须小于 1/2 边长; If the protective layer could be stick once again, it will be acceptable; but if it isn't, and the long side should less than 1/3 of polarizer length, short side should less than 1/2 of polarizer length.</p> <p>(2) 保护膜翘起导致偏光片有明显划伤、镜脏拒收。 Protective layer separated from polarizer lead to the polarizer is evident crack or dirty is reject.</p>	
4	彩虹 Rainbow of backlight color	<p>有明显有异色拒收或依限度样板。 If it is evident has different color is reject or according to limited sample</p>	次缺 Minor Defect
5	底色 Different background color	<p>同批货品底色有明显差异拒收或依限度样板。 One batch products have the different background color is reject or according to limited sample</p>	次缺 Minor Defect
6	导电点 Contact Dot	<p>导电胶外露拒收。 Contact glue besides is reject</p>	次缺 Minor Defect
7	边框胶 End sealing	<p>(1) 密封不良拒收; Pressurize defect is reject (2) 进入视区拒收; End sealing in the viewing area is reject (3) 宽度小于 0.35mm 拒收; Width less than 0.35mm is reject (4) 边框胶夹缝处(电极线区域和其它有 ITO 位置)有液晶残</p>	主缺 Major Defect 次缺 Minor Defect 次缺 Minor Defect 次缺

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		<p>留和脏物拒收； There is liquid crystal and dirt in electrode line area and other ITO position is reject.</p> <p>(5) 边框胶内气泡：需保留 1/2 框胶宽度； There is air bubble in end sealing: need to keep 1/2 end sealing width</p> <p>(6) 边框胶内缘毛边入视区拒收，边框凸起<math>\leq 1/3</math> 边框宽度，边框变细<math>\leq 1/2</math> 边框宽度。 End sealing in the viewing area is reject, frame heave no more than 1/3 frame width, frame thin no more than 1/2 frame width</p>	<p>Minor Defect</p> <p>次缺 Minor Defect</p>
8	8.1 密封性 Pressurize quality	<p>密封不良拒收。 Pressurize defect is reject.</p>	主缺 Major Defect
	8.2 封口胶方向 End sealing bearing	<p>封口胶方向需与工程图一致，否则拒收。 End sealing bearing should be the same as engineering drawing, or reject.</p>	次缺 Minor Defect
	8.3 胶污 Glue dirty	<p>拒收； Reject</p>	次缺 Minor Defect
	8.4 胶长、厚、偏 End sealing dimension	<p>超出工程图规格拒收；胶偏未盖住开口拒收。 Over engineering drawing is reject, end sealing deflect and don't cover the hatch is reject</p>	次缺 Minor Defect
	8.5 透胶 End sealing over permeate	<p>封口胶透胶进入视区拒收。 Into viewing area is reject X: 封口深度 The deepness of the seal</p>  <p>The diagram shows a cross-section of the end sealing. A vertical dimension line labeled 'X' indicates the depth of the seal. A horizontal dimension line labeled '1/3 X' indicates the width of the seal at the bottom edge.</p>	次缺 Minor Defect 次缺 Minor Defect
9	PIN 不良 PIN defect	<p>(1) PIN 组装位置偏移需符合工程图规格；若未注明则 PIN 中心与电极中心偏差必须在 0.25mm 内； The position of install pin should be according to engineering drawing; If it isn't note, the warp of middle of pin and middle of electrode should in 0.25mm</p> <p>(2) PIN 胶水厚度不可高出偏光片，且涂布范围不得覆盖到偏光片； The thickness pin glue couldn't exceeds polarizer, and cover area couldn't cover polarizer</p> <p>(3) PIN 胶水不得流至 PIN 脚； Pin glue couldn't flow to PIN</p> <p>(4) PIN 胶水涂布不足：导电端子正背面均需有胶，胶量最少需覆盖背面 PIN 最低点处； Pin glue not enough: conduct electric pins should have glue in just and back sides, the less should cover the lowest of pin in back side.</p> <p>(5) PIN 脚歪斜角度公差须于<math>\pm 5^\circ</math> 范围内(若工程图另有规定则依工程图为依据)；</p>	次缺 Minor Defect

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NO	项 目	规 格	缺陷 定义						
9	PIN 不良 PIN defect	<p>The tolerance of PIN deflection should less than <math>\pm 5^\circ</math> (Unless there's other prescribe, according to engineering drawing)</p> <p>(6) PIN 本体刮伤不可造成铜裸露; Pin crack couldn't lead to copper bareness</p> <p>(7) PIN 表面不得脏污及生锈; The surface of PIN couldn't be dirty or rusty</p> <p>(8) 夹 PIN 胶内有汽泡但未造成破洞可允收; There's air bubble in PIN glue, but won't lead to break is acceptable</p> <p>(9) PIN 型式、PIN 数、PIN 长、PIN 弯角、尺寸需与工程图不一致拒收; If the mode, number, length, bend angle, dimension of PIN won't according to engineering drawing is reject.</p> <p>(10) PIN 不能有皱痕及污损。 There couldn't have crimple or defile at PIN</p>	次缺 Minor Defect						
10	油墨印刷 Printing ink print	<p>(1) 图形印刷需与工程图一致, 不可错误、漏印、颜色错误或未烘干; Print figure should according to engineering drawing, couldn't be wrong, lack, color wrong or not drying;</p> <p>(2) 油墨色泽有明显偏差拒收或依限度版; Color of printing ink have evident warp is reject or according to limited sample.</p> <p>(3) 印刷框线不连续(断线处按线状缺陷计)或粗细不一拒收; The line of printing frame discontinuity or thickness different is reject</p> <p>(4) 印刷框线倾斜必须小于 <math>\pm 1^\circ</math> ; The incline of line of printing frame should less than <math>\pm 1^\circ</math></p> <p>(5) 印刷位置偏移: 依工程图规格判定; 若工程图未标识公差时偏位不可超过 <math>\pm 0.20\text{mm}</math> 且不可碰到显示字体; Printing position excursion: according to engineering drawing to estimate; If the it isn't sign tolerance, it couldn't exceed <math>\pm 0.20\text{mm}</math>, and couldn't affect the display font.</p> <p>(6) 印刷线宽判定 Printing line width estimation:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">W: 设计宽度 Design width</th> <th style="text-align: center;">P: 实际印刷线宽 Actual printing width</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><math>W \leq 0.40</math></td> <td style="text-align: center;"><math> W-P  \leq 1/2W</math></td> </tr> <tr> <td style="text-align: center;"><math>W &gt; 0.40</math></td> <td style="text-align: center;"><math> W-P  \leq 0.20</math></td> </tr> </tbody> </table> <p style="text-align: center;">注: 如工程图上有规定, 则依工程图所示。 Note: If the engineering drawing has regulation, please according to it.</p> <p>(7) 印刷图案凹点、凸点、针孔判定: Printing pattern concave dot, protruding dot, pin hole estimation:</p>	W: 设计宽度 Design width	P: 实际印刷线宽 Actual printing width	$W \leq 0.40$	$ W-P  \leq 1/2W$	$W > 0.40$	$ W-P  \leq 0.20$	主缺 Major Defect  次缺 Minor Defect 次缺 Minor Defect 次缺 Minor Defect 次缺 Minor Defect 次缺 Minor Defect  次缺 Minor Defect
W: 设计宽度 Design width	P: 实际印刷线宽 Actual printing width								
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			次缺 Minor Defect						



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		<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">尺 寸 Dimension</td> <td style="padding: 5px;">允许个数 Acceptable number</td> </tr> <tr> <td style="padding: 5px;"><math>\Phi &lt; 0.10</math></td> <td style="padding: 5px;">无 视 Ignore</td> </tr> <tr> <td style="padding: 5px;"><math>0.10 &lt; \Phi \leq 0.25</math></td> <td style="padding: 5px;">2</td> </tr> <tr> <td style="padding: 5px;"><math>0.25 &lt; \Phi</math></td> <td style="padding: 5px;">0</td> </tr> </table>	尺 寸 Dimension	允许个数 Acceptable number	$\Phi < 0.10$	无 视 Ignore	$0.10 < \Phi \leq 0.25$	2	$0.25 < \Phi$	0	Minor Defect
尺 寸 Dimension	允许个数 Acceptable number										
$\Phi < 0.10$	无 视 Ignore										
$0.10 < \Phi \leq 0.25$	2										
$0.25 < \Phi$	0										
		注：两点间距必须大于 5mm。 Note: The distance between the two dots should larger than 5mm. (8) 印刷图案黑点，刮花参见点状线状缺陷规格； Printing pattern have black dot, crack, please according to Dot and Line Defect Criteria (8) 毛边：起伏幅度须 $\leq 0.20\text{mm}$ 。 Burred: Wave range should no more than 0.20mm	次缺 Minor Defect								

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### 10. Outline dimension

