

# PRODUCT SPECIFICATION

**MODEL:** 101BI4001D3H9II-A

< ◇ > PRELIMINARY SPECIFICATION

< ◆ > APPROVAL SPECIFICATION

CUSTOMER
APPROVED BY
DATE:

DESIGNED	CHECKED	APPROVED

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## **REVISION RECORD**

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## 1.0 GENERAL SPECIFICATIONS

**101BI4001D3H9II-A** is a color active matrix LCD module incorporating amorphous silicon **TFT** (Thin Film Transistor). It is composed of a color TFT-LCD panel, driver IC, FPC and a backlight unit. The module display area contains **800x 1280**pixels. This product accords with RoHS environmental criterion.

Item	Contents	Unit
Screen Diagonal	<b>10.1"</b>	Inch
Viewing direction	<b>Full View</b>	
Shape size	<b>143*228.6*2.6</b>	mm
Display Area	<b>135.36*216.58</b>	mm
Number of Dots	<b>800(RGB) x1280</b>	/
Display Mode	<b>Normally Black</b>	/
Number of color	<b>16.7M</b>	/
Interface	<b>MIPI</b>	
LCM Luminance	<b>250(typ)</b>	cd/m <sup>2</sup>
Response Time (Tr+Tf)	<b>25ms (typ)</b>	/
Contrast Ratio	<b>800</b>	/

## ABSOLUTE MAXIMUM RATINGS

The following are maximum values which if exceeded may cause faulty operation or damage to the unit.

Item	Symbol	Min	Max	Unit	Note
Digital Supply Voltage	VDD	-0.5	5.0	V	

## 3.0 ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Digital Power Supply Voltage For LCD	VDD	3.0	3.3	3.6	V	-
Current for Driver	IVDDIN	-	160	-	MA	

### 3.1 BACKLIGHT CHARACTERISTICS

Item	Symbol	Min	Typ	Max	Unit	Condition
Forward voltage	Vf	8.4	9.0	10.2	V	If=180mA
Luminance	Lv	220	250	-	cd/m²	If=180mA
Number of LED	--	27			Piece	--
Connection mode	P	3chips serial *9			--	--

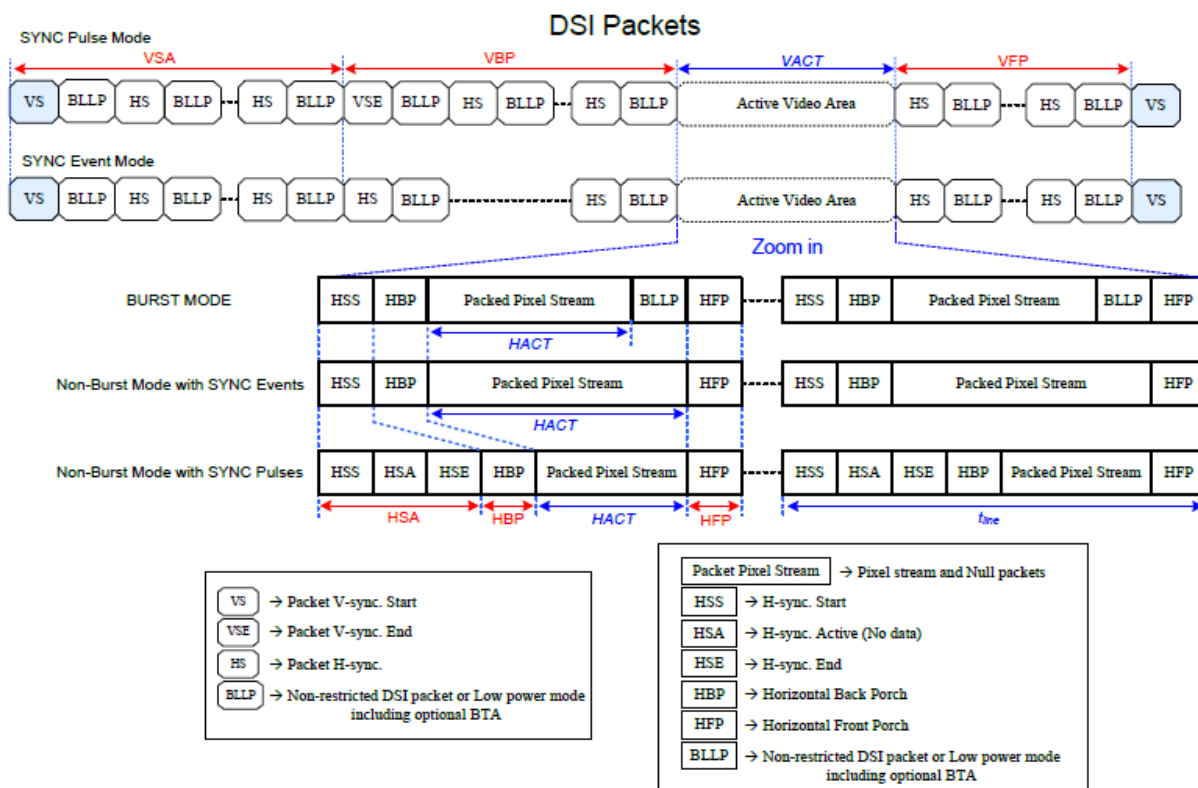
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## 5.0 PINTERFACE PIN CONNECTIONS

Pin No.	Symbol	Description	Remarks
1	NC	Not connection	
2, 3	VDDIN	Power Supply (3.3V)	
4	GND	Ground	
5	RST	Device reset signal (3.3V)	
6	NC	Not connection	
7	GND	Ground	
8	MIPI_ON	MIPI DSI Data Pair 0-Input	
9	MIPI_OP	MIPI DSI Data Pair 0+Input	
10	GND	Ground	
11	MIPI_1N	MIPI DSI Data Pair 1-Input	
12	MIPI_1P	MIPI DSI Data Pair 1+Input	
13	GND	Ground	
14	MIPI_CKN	MIPI DSI Clock- Input	
15	MIPI_CKP	MIPI DSI Clock+ Input	
16	GND	Ground	
17	MIPI_2N	MIPI DSI Data Pair 2-Input	
18	MIPI_2P	MIPI DSI Data Pair 2+Input	
19	GND	Ground	
20	MIPI_3N	MIPI DSI Data Pair 3-Input	
21	MIPI_3P	MIPI DSI Data Pair 3+Input	
22	GND	Ground	
23, 24	NC	Not connection	
25	GND	Ground	
26	NC	Not connection	
27	PWM0	PWM Control signal for LED driver	
28	NC	Not connection	
29	NC	Not connection	
30	GND	Ground	
31, 32	LED-	LED Cathode	
33-38	NC	Not connection	
39, 40	LED+	LED Anode	

## 6.0 TIMING CHARACTERISTICS OF INPUT SIGNAL

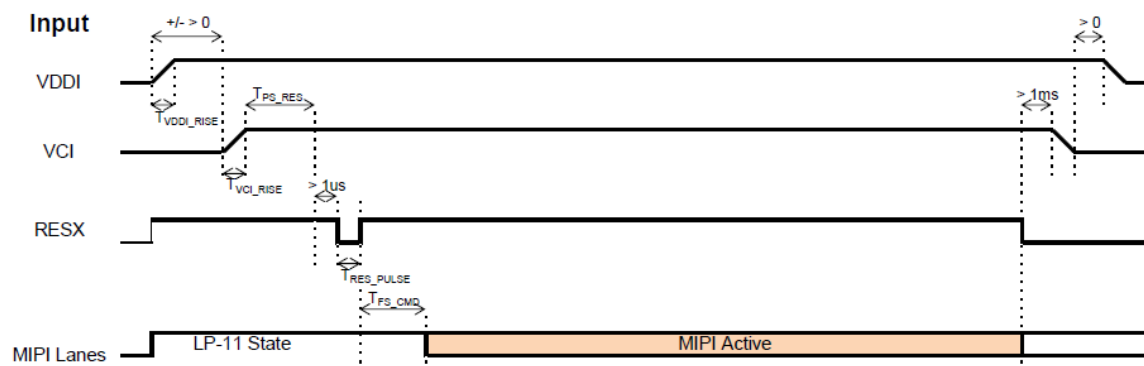
### 6.1 Timing Characteristics



Parameter	Symbol	Min	Typ	Max	Unit
Horizontal Display	thd	-	800	-	DCLK
HSD Period	th	-	936	-	
HSD Pulse Width	thpw	-	16	-	
HSD Back Porch	thbp	-	60	-	
HSD Front Porch	thfp	-	60	-	
Vertical Display Area	tvd	-	1280	-	DCLK
VSD Period	Tv	-	1304	-	DCLK
VSD Pulse width	tvpw	-	4	-	
VSD Back Porch	tvbp	-	10	-	
VSD Front Porch	tvfp	-	10	-	

## 6.2 Power on sequence for differential power mode

### Case A:



Symbol	Characteristics	Min.	Typ.	Max.	Units
$T_{VDDI\_RISE}$	VDDI Rise time	10	-	-	us
$T_{VCI\_RISE}$	Case A: VCI Rise time	130	-	-	us
	Case B: VCI Rise time	40			
$T_{PS\_RES}$	VDDI/VCI on to Reset high	5	-	-	ms
$T_{RES\_PULSE}$	Reset low pulse time	10	-	-	us
$T_{FS\_CMD}$	Reset to first command	10	-	-	ms

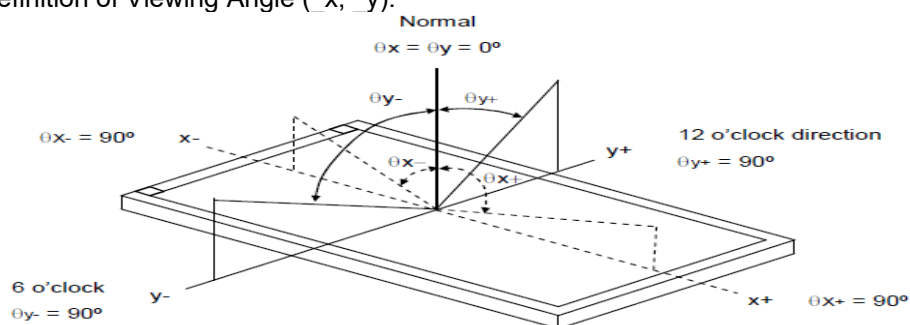
Figure 105: Power on/off sequence with Power Mode 3

## 7.0 ELECTRO-OPTICAL CHARACTERISTICS

Ta=25°C

ITEM		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Luminance		L	$\theta = 0^{\circ}$	220	250	--	cd/m <sup>2</sup>	Note1
Luminance Uniformity		YU	9 Point	75	80	--	%	Note5
Contrast Ratio		CR	$\theta = 0^{\circ}$	--	800	--	—	Note3
Response Time		Rr+Tf	$\theta = 0^{\circ}$	--	25	--	ms	Note4
Viewing Angle K=Contrast Ratio>10	Horizontal	⊖ L	CR>10 $\theta = 0^{\circ}$	--	85	--		
		⊖ R		--	85	--		
	Vertical	⊖ U		--	85	--		
		⊖ D		--	85	--		
Color Filter Chromaticity	White	X	$\theta = 0^{\circ}$	0.250	0.280	0.310		Note1
		Y		0.250	0.280	0.310		
	Red	X	$\theta = 0^{\circ}$	0.616	0.646	0.676		
		Y		0.323	0.353	0.383		
	Green	X	$\theta = 0^{\circ}$	0.302	0.332	0.362		
		Y		0.547	0.577	0.607		
	Blue	X	$\theta = 0^{\circ}$	0.110	0.140	0.170		
		Y		0.052	0.082	0.112		
Color gamut (NTSC ratio)				50	55		%	
colour temperature				8500	10000	11500		

Note (1) Definition of Viewing Angle (  $x, y$ ):



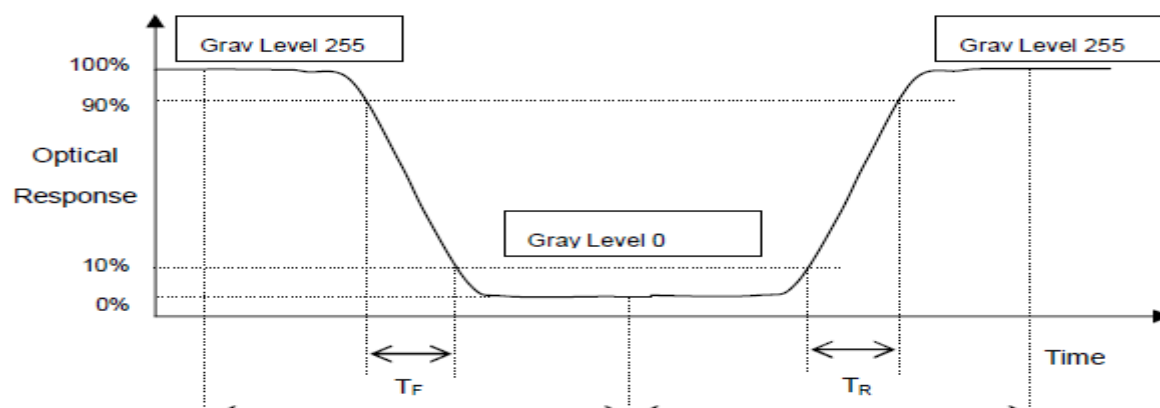
Note (2) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression:

Contrast Ratio (CR) =  $L_{255} / L_0$   
 $L_{255}$ : Luminance of gray level 255  
 $L_0$ : Luminance of gray level 0  
 $CR = CR(5)$

$CR(X)$  is corresponding to the Contrast Ratio of the point X at Figure in Note (6).

Note (3) Definition of Response Time ( $T_R$ ,  $T_F$ ):



Note (4) Definition of Center Point Luminance of White ( $L_{CP}$ ):

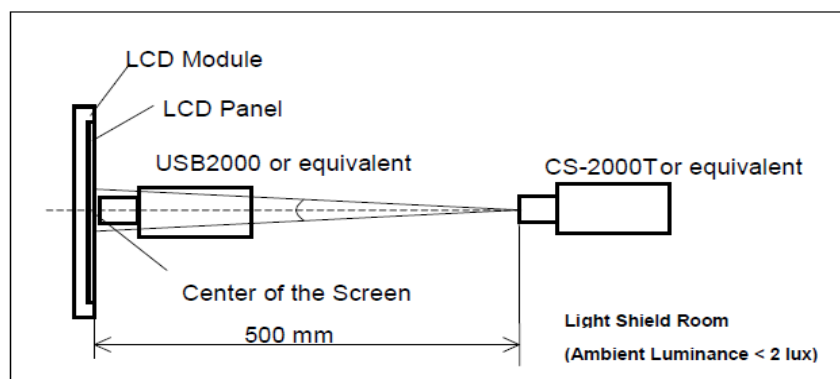
Measure the luminance of gray level 255 at center point

$L_{CP} = L(5)$

$L(x)$  is corresponding to the luminance of the point X at Figure in Note (6)

Note (5) Measurement Setup:

The LCD module should be stabilized at given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



Note (6) Definition of White Variation ( $\delta W$ ):

Measure the luminance of gray level 255 at 9 points

$$\delta W_{9p} = \{ \text{Minimum } [L(1) \sim L(9)] / \text{Maximum } [L(1) \sim L(9)] \} * 100\%$$

## 8.0 RELIABILITY

### 8.1 MTBF

The LCD module shall be designed to meet a minimum MTBF value of 50000 hours with normal. (25°C in the room without sunlight)

### 8.2 Tests

NO.	Test Item	Test condition	Criterion
1	High Temperature Storage	60°C±2°C 96H Restore 2H at 25°C Power off	
2	Low Temperature Storage	-10°C±2°C 96H Restore 2H at 25°C Power off	
3	High Temperature Operation	50°C±2°C 96H Restore 2H at 25°C Power on	
4	Low Temperature Operation	0°C±2°C 96H Restore 2H at 25°C Power on	
5	High Temperature & Humidity Operation	40°C±2°C 90%RH 96H Power on	
6	Temperature Cycle	-10°C ↔ 60°C 30min 30min after 10cycle, Restore 2H at 25°C Power off	After testing, cosmetic and electrical defects should not happen.
7	Vibration Test	10Hz~45Hz, 100m/s <sup>2</sup> , 120min	
8	Shock Test	Half-sine wave, 300m/s <sup>2</sup> , 11ms	
9	Drop Test(package state)	800mm, concrete floor, 1 corner, 3 edges, 6 sides each time	1. After testing, cosmetic and electrical defects should not happen. 2. the product should remain at initial place 3. Product uncovered or package broken is not permitted.
10	Electro Static Discharge Test (non-operation)	150pF, 330 Ω, Contact: ±4KV, Air: ±8KV Measure point :LCD glass and metal bezel 200pF, 0 Ω, ±200V contact test Measure point :IF connector pins	IEC61000-4-2: 2001 GB/T17626.2-2006

## 9.0 INSPECTION STANDARDS

### 9.1 Purpose

This incoming inspection standard shall be applied to TFT-LCD supplied by ZHONGSHEN to its customer.

### 9.2 Scope

This inspection standard contains Cosmetic Specifications and Electrical Specifications.

### 9.3 Classification of defects

#### 9.3.1 Major defect.

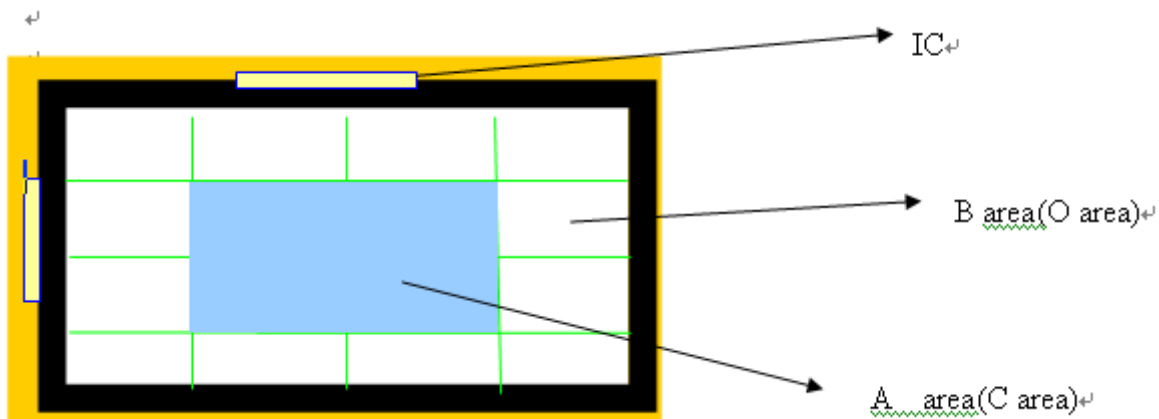
The major defect is a defect that is likely to result in product failure or reduction in Product's intended usage.

#### 9.3.2 Minor defect.

The minor defect is a defect that has little bearing on the effective use or Operation of the product.

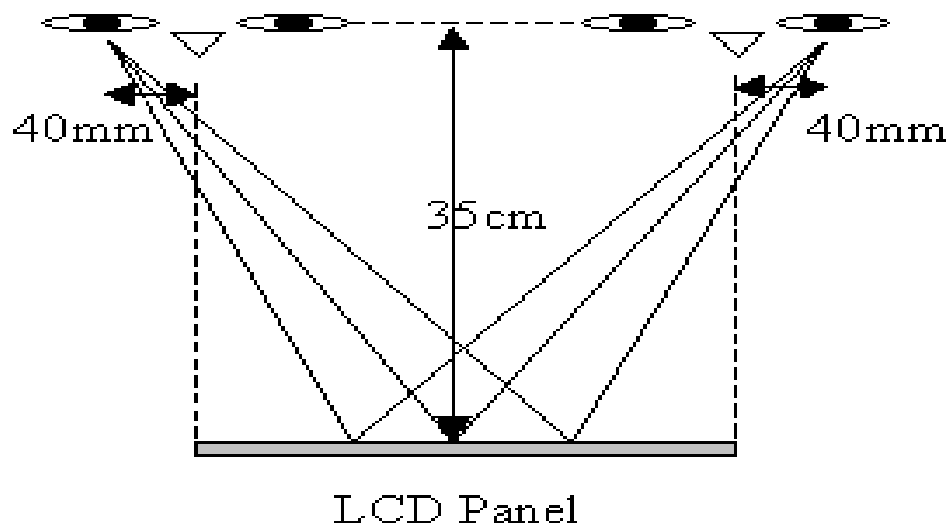
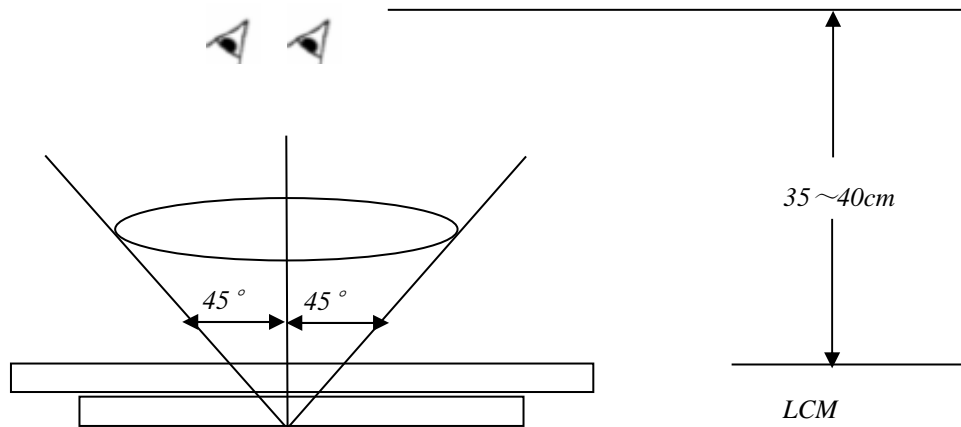
### 9.4 Definition

#### 9.4.1 Display area definition



## 9.5 Inspection conditions is as follows

- 9.5.1 Viewing distance is approximately 35-40 cm
- 9.5.2 Viewing angle is normal to the LCD panel as  $45^\circ$
- 9.5.3 Ambient temperature is approximately  $25\pm 5^\circ\text{C}$
- 9.5.4 Ambient humidity is  $60\pm 5\%$  RH
- 9.5.5 Ambient luminance is from 300-500 Lux.
- 9.5.6 Input signal timing should be typical value(3s-5s).
- 9.5.7 Mura & Light leakage inspection at ND-Filter 6%.



## 9.6 Sampling method

9.6.1 According to the MIL-STD-105E general inspection level , II Sampling plan.

9.6.2 AQL: MA 0.65 MI 1.0

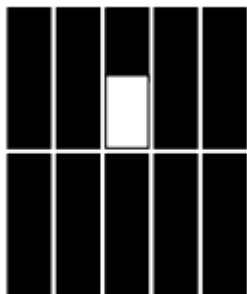
## 9.7 Inspection Criteria

DEFECT TYPE			LIMIT			Defect	Note
VISUAL DEFECT	SCRATCH		W≤0.05mm and L≤5mm		Ignore	Ma j	NOTE1
			0.05mm<W≤0.2mm L≤10mm		N≤4		
			10mm<L, 0.1mm<W		N=0		
	INTERNAL	SPOT	Φ ≤0.2mm		Ignore		
			0.2mm<Φ ≤0.5mm		N≤4		
			Φ >0.5mm		N=0		
		FIBER	0.1mm≤W≤0.2mm L≤2.5mm		N≤4		
			0.2mm<W, 2.5mm<L		N=0		
		POLARIZER BUBBLE	Φ ≤0.25mm		Ignore		
			0.25mm<Φ ≤0.5mm		N≤4		
			Φ >0.5mm		N=0		
		DENT	Φ <0.25mm		Ignore		
			0.25mm≤Φ ≤0.5mm		N≤4		
			Φ >0.5mm		N=0		
ELECTRICAL DEFECT	BRIGHT DOT		C Area	O Area	Total	Ma j	NOTE2 NOTE3
			N≤4 (contain C area and O area)		N≤4		
	DARK DOT		N≤5 (contain C area and O area)		N≤5		
	TWO ADJACENT DOT		N≤1	N≤2	N≤3		
	THREE OR MORE ADJACENT DOT		NOT ALLOWLED				
	LINE DEFECT		NOT ALLOWLED				

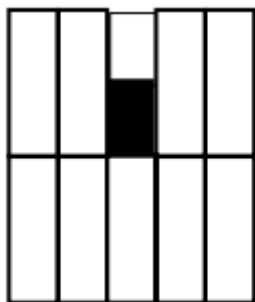
Note1: Minimum distance between dot defects and spot is 5mm;

Note2: The definition of Bright dot and Dark dot

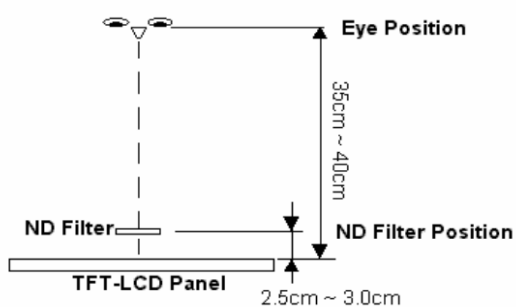
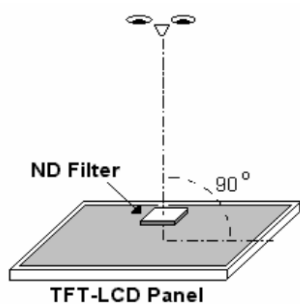
-bright area is more than 50% of one dot



-dark area is more than 50% of one dot



-The bright dot shall be visible under ND-Filter 5% as following:

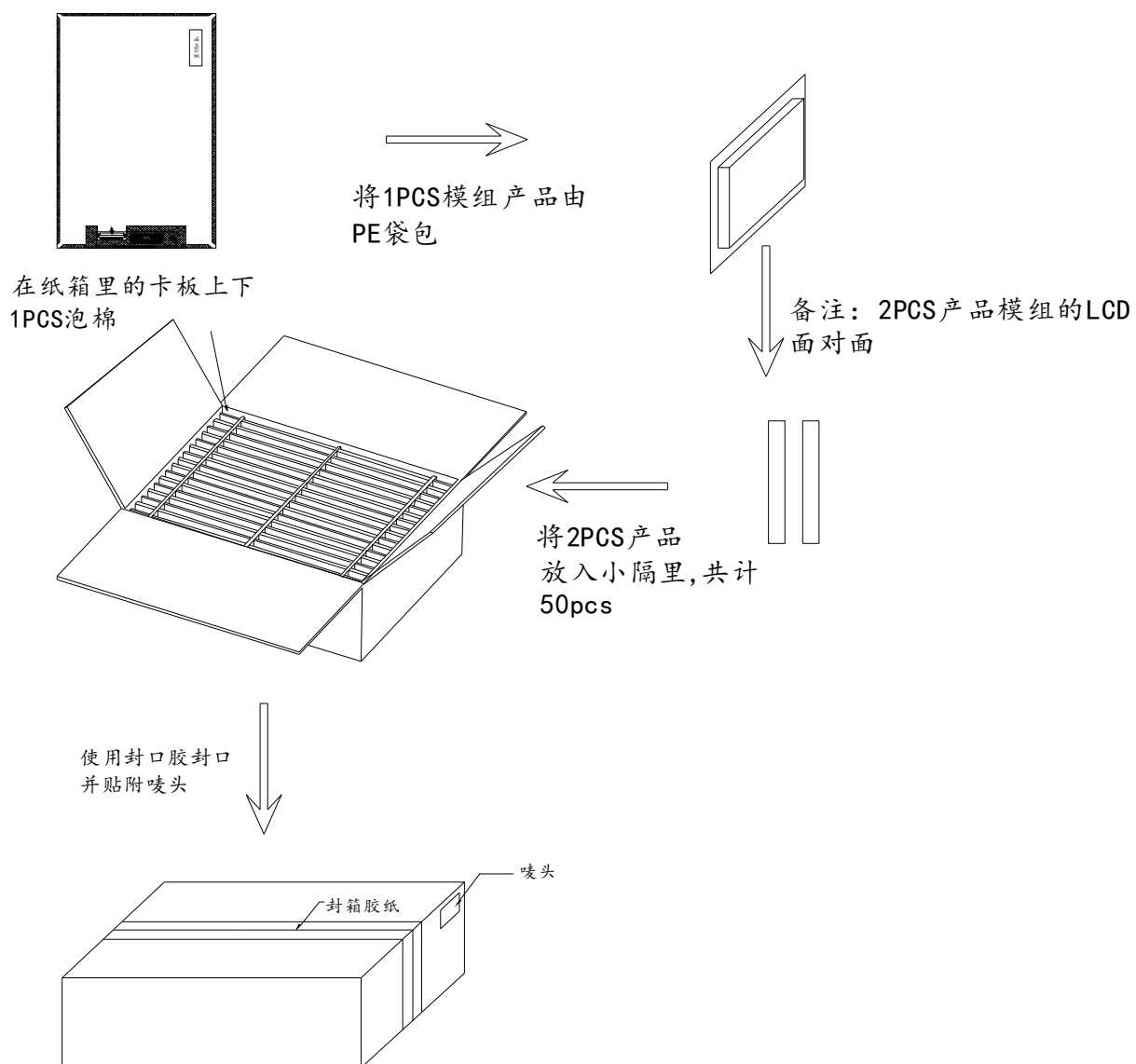


NOTE3:

- A bit rate(bright dot model )  $\leq 10\%$ ;
- Class Chipping but not affect the function of quality OK;
- Polarizing film appearance does not affect the function OK;

## 10.0 PACKING DRAWING

### 包装图：



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DATE 日期	2021-7-28			101B14001D3H911-A			
PAGE 页码	6/6			客户:			

## 11.0 HANDLING PRECAUTION

- (1) Don't disassemble and reassemble the module by self.  
(禁止自行拆解)
- (2) Acid, alkali, alcohol or touched directly by hand will damage the display.  
(酸性、碱性、酒精或手的直接接触将会损伤显示面)
- (3) Static electricity will damage the module. Please configure grounding device.  
(静电会损伤模组，请装配接地设备)
- (4) The strong vibration, shock, twist or bend will cause material damage, even module broken.  
(强烈的撞击、震动、扭转或弯曲将会造成原材损伤，甚至面板破裂)
- (5) It is easy to cause image sticking while displaying the same pattern for very long time.  
(长期显示同一画面会造成影像残留)
- (6) The response time, brightness and performance will vary from different temperature.  
(响应时间、亮度与均匀性会因温度而有所改变)
- (7) Starting from the date of shipment in the photoelectric products for a period of 12 months.  
(从出货之日开始产品保质期为 12 个月)