



Product Specification

Model Name	KS104XGH01HS
Description	10.4" WSVGA 1024(RGB)x768 Dots
Date	2020/6/20
Version	1.0

Approved by/Date	Check by/Date	Prepared by/Date
Borger 2020/6/20	Kevin 2020/6/20	Evan 2020/6/20

Customer Approval	
Date	

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1. Record of Revision

Rev	Issued Date	Description	Editor
1.0	2020/6/20	First Release.	Evan

2. General Specifications

2.1 DESCRIPTION

This LCM is a color active matrix thin film transistor (TFT) IPS liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. It is composed of a TFT LCD panel, Driver IC, FPC and Backlight, This TFT LCD has a 10.4-inch diagonally measured active display area with 1024x768 resolution (1024vertical by 768 horizontal pixel array).

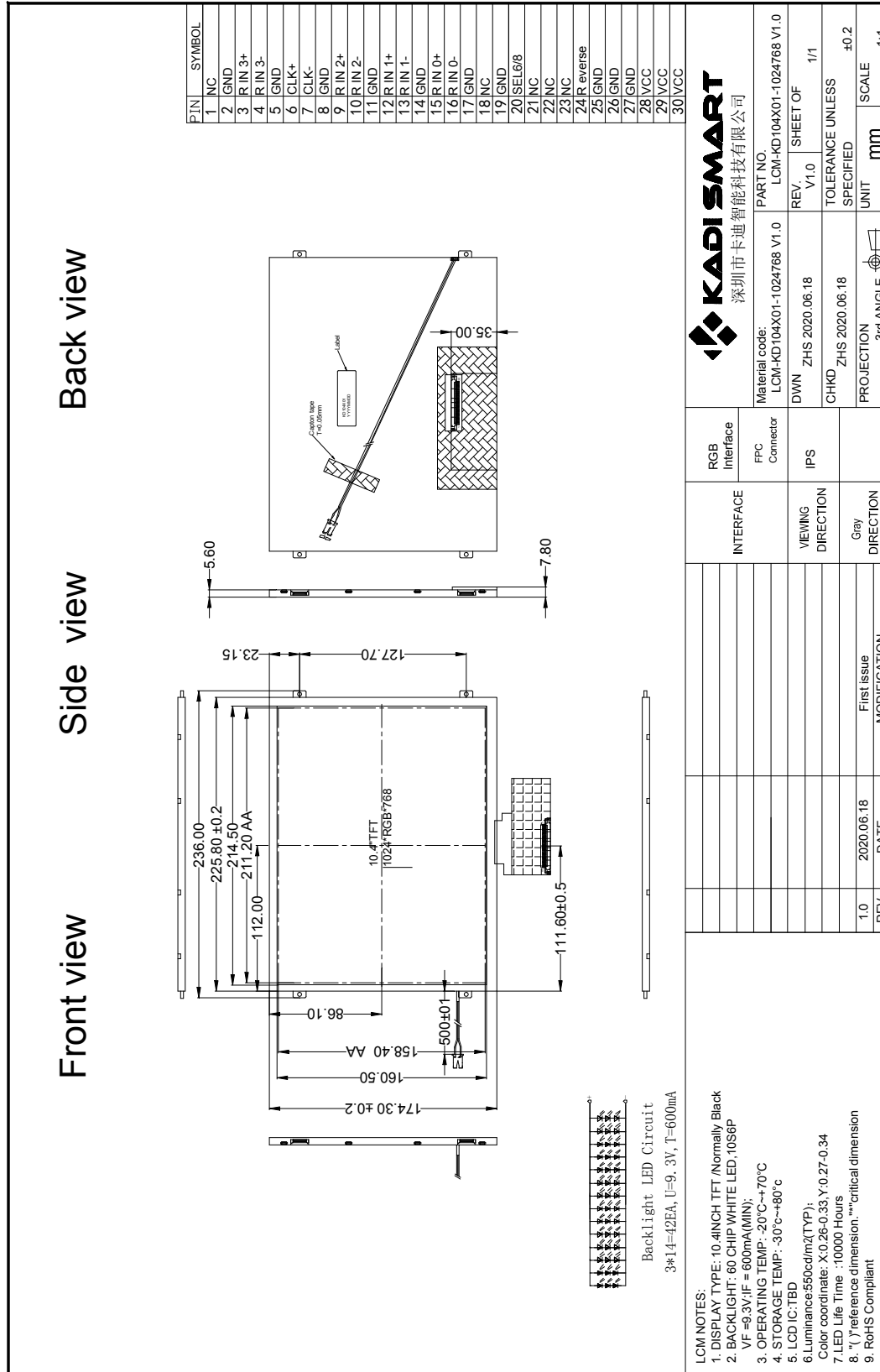
2.2 FEATURES:

No.	Item	Specification	Unit
1	Panel Size	10.4"	inch
2	Number of Pixels	1024×RGB (3)×768	pixels
3	Active Area	211.2(H)x 158.48(V)	mm
4	Pixel Pitch	0.20625(H)×0.20625(V) x RGB	mm
5	Outline Dimension	225.8(W)×174.3(H)×5.6(D)	mm
6	Number of Colors	16.7M	-
7	Display Mode	Transmission mode, normally black	-
8	Viewing Direction	Full viewing	-
9	Display Format	RGB vertical stripe	-
11	Surface Treatment	Anti-Glare	-
12	Interface	LVDS	-
13	Backlight	White LED	-
14	Operation Temperature	-20~+70	°C
15	Storage Temperature	-30~80	°C
16	Weight	TBD(±10)	g

2.3 Mechanical Informatio

	Item	Min.	Typ.	Max.	unit
Module size	Horizontal(H)	225.6	225.8	226	mm
	Vertical(V)	174.1	174.3	174.6	mm
	Depth(D)	5.4	5.6	5.8	mm
weight		---	330	---	g

3. Mechanical Drawing



4. Input/Output Terminals

Lvds Connector JAE Model Number :FI-XB30SSLA-HF15 (Adaptable Plug:FI-X30C2EL)

No.	Symbol	Function	Remark
1	NC	No connection	
2	GND	Ground	
3	RIN3+	LVDS Signal(+)-channel 3	
4	RIN3-	LVDS Signal(-)-channel 3	
5	GND	Ground	
6	RXCLK+	LVDS Clock Signal(+)	
7	RXCLK-	LVDS Clock Signal(-)	
8	GND	Ground	
9	RIN2+	LVDS Signal(+)-channel 2	
10	RIN2-	LVDS Signal(-)-channel 2	
11	GND	Ground	
12	RIN1+	LVDS Signal(+)-channel 1	
13	RIN1-	LVDS Signal(-)-channel 1	
14	GND	Ground	
15	RIN0+	LVDS Signal(+)-channel 0	
16	RIN0-	LVDS Signal(-)-channel 0	
17	GND	Ground	
18	NC	No connection	
19	GND	Ground	
20	SEL6/8	SELB="0" 8Bit SELB="1" 6Bit	
21	NC	No connection	
22	NC	No connection	
23	NC	No connection	
24	REVERSE	Reverse Panel function	
25	GND	Ground	
26	GND	Ground	
27	GND	Ground	
28	VCC	power Voltage for digital circuit 3.3V	
29	VCC	power Voltage for digital circuit 3.3V	
30	VCC	power Voltage for digital circuit 3.3V	

5. Absolute Maximum Rating

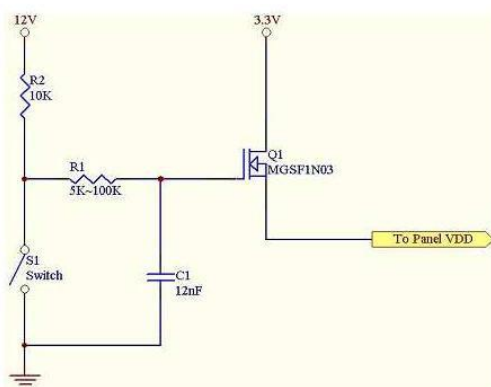
Item	Symbol	Min.	Max.	Unit
Digital Supply Voltage	VDD	-0.3	5.0	V
Back light Power	V	-0.3	28	V

6. Electrical Characteristics

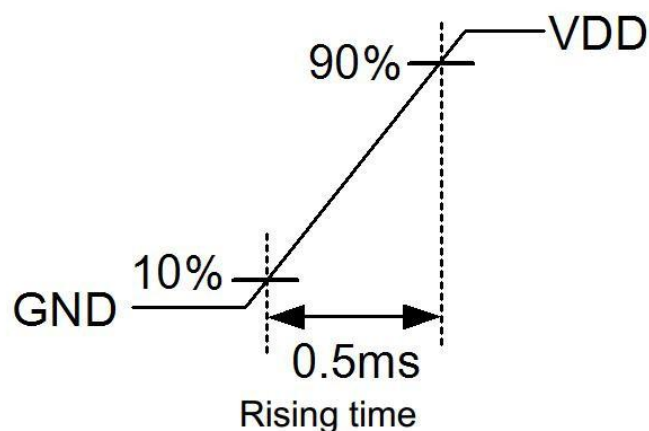
6.1 OPERATING CONDITIONS

Parameter	Symbol	Min.	Max.	Unit
Digital Power Supply Voltage	VDD	2.8	3.6	V
Current of power	IDD	--	--	A
VDD	P _{DD}			W
Inrush current	IRUSH		2.0	A
Back light Powe	V	8.2	10.5	V

Note* : Inrush current test circuit and rising time setting (power on)



Test circuit



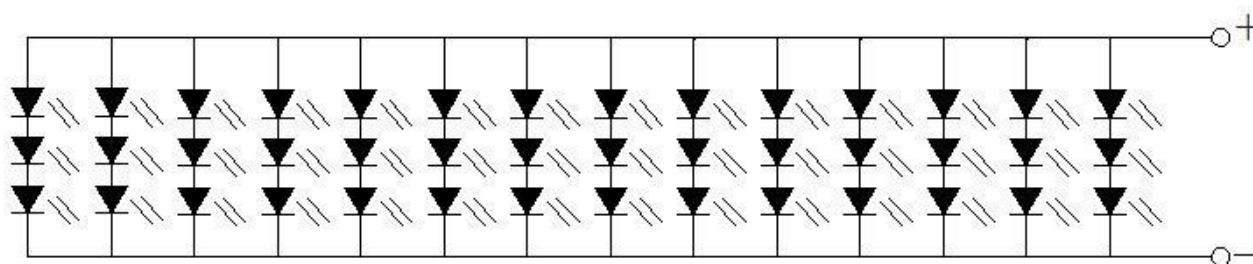
6.2 Switching Characteristics for LVDS Receiver

Symbol	Item	Min.	Typ.	Max.	Unit	Remark
VTH	Differential Input High Threshold	--	-	100	mV	VCM=1.2V
VTL	Differential Input Low Threshold	100	--	0.3	mV	A
VID	Input Differential Voltage	100	400	600	mV	W
VICM	Differential Input Common Mode Voltage	1.1		1.45	V	A

6.3 BACK LIGHTUNIT

Ta=25°C

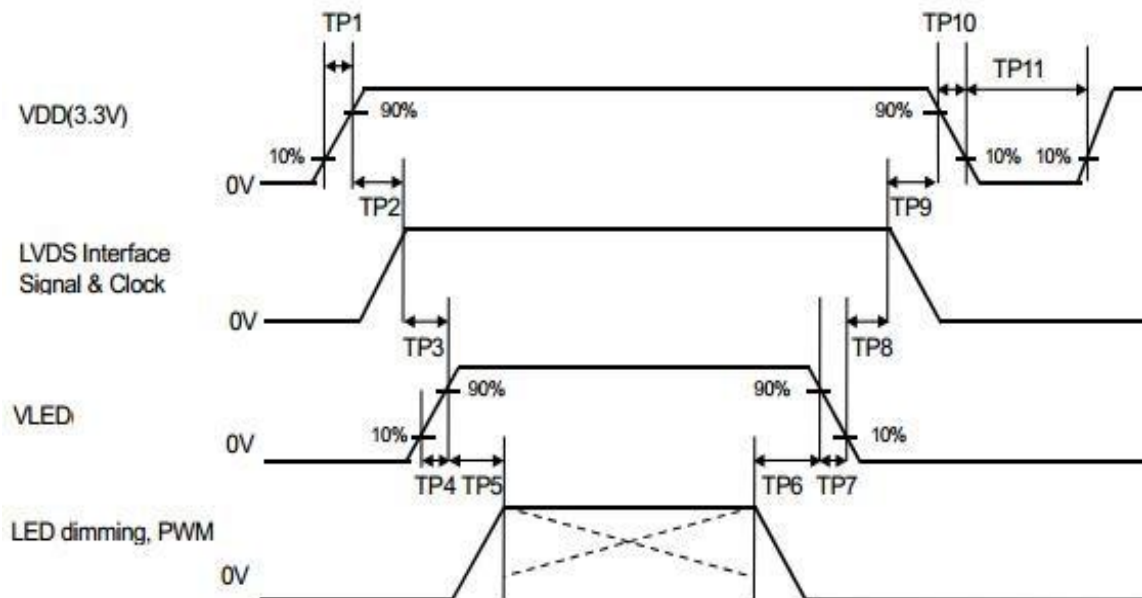
Item	Symbol	Min.	Typ.	Max.	Unit	Remark
LED current	I _{LED}		600		mA	Total LED
Forward voltage	V _F	8.2	9.6	10.5	V	I _F =240mA
Reverse current	I _R			50	μA	V _R =5V,1LED
Power dissipation	P _d	6000			mW	Total LED
Peak forward current	I _{FP}	150			mA	1LED
Reverse Voltage	V _R	5			V	1LED



线路图

Backlight LED Circuit
 $3 \times 14 = 42 \text{EA}$, $U = 9.6 \text{V}$, $I = 600 \text{mA}$

6.4 POWER ON/OFF SEQUEN



Item	Min.	Typ.	Max.	Unit
TP1	0.5	--	10	msec
TP2	0	--	50	msec
TP3	200	--	--	msec
TP4	0.5	--	10	msec
TP5	10	--	--	msec
TP6	10	--	--	msec
TP7	0	--	10	msec
TP8	200	--	--	msec
TP9	0	--	50	msec
TP10	1	--	10	msec
TP11	1000	--	--	msec

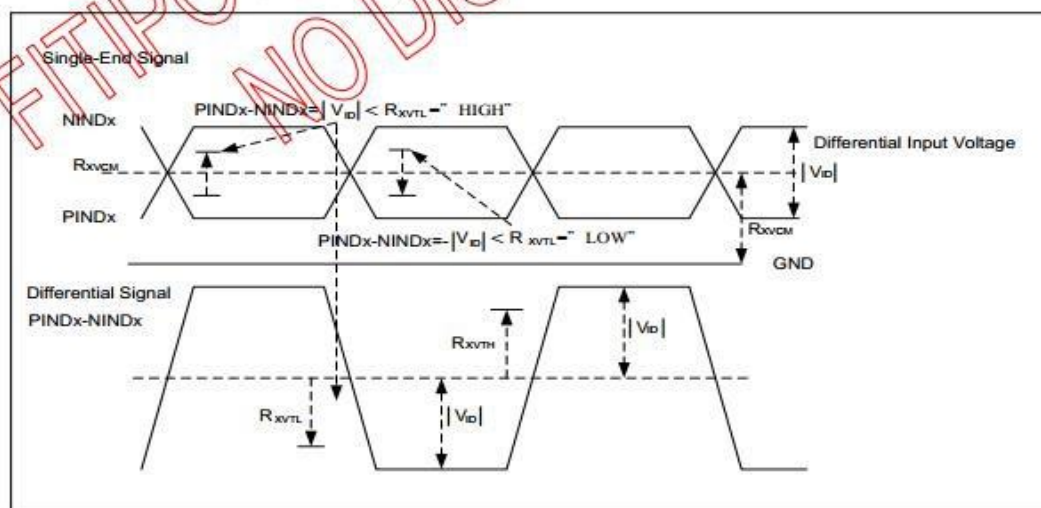
7. INPUT SIGNAL TIMING

7.1 MODE DC ELECTRICAL CHARACTERISTICS.

LVDS Mode (Receiver Differential: PIND0~PIND3, NIND0~DIND3, PINC, NINC)

LVDS DC characteristic

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Differential input high threshold voltage	R_{xVTH}			+0.1V	V	$R_{xVCM}=1.2V$
Differential input low threshold voltage	R_{xVTL}	-0.1			V	
Input voltage range(single-end)	R_{xVIN}	0		2.4	V	
Differential input common mode voltage	R_{xVCM}	$ V_{ID} /2$		$2.4 - V_{ID} /2$	V	
Differential input voltage	$ V_{ID} $	0.2		0.6	V	
Differential input leakage current	R_{xVTH}	-10		+10	μA	
LVDS Digital Operating Current	I_{ddlvds}	-	40(TBD)	50	mA	Fclk=65Mhz, VDD=3.3V
LVDS Digital Standby Current	I_{stlvds}	-	10(TBD)	50	μA	Clock & all functions are stop



LVDS DC Characteristic

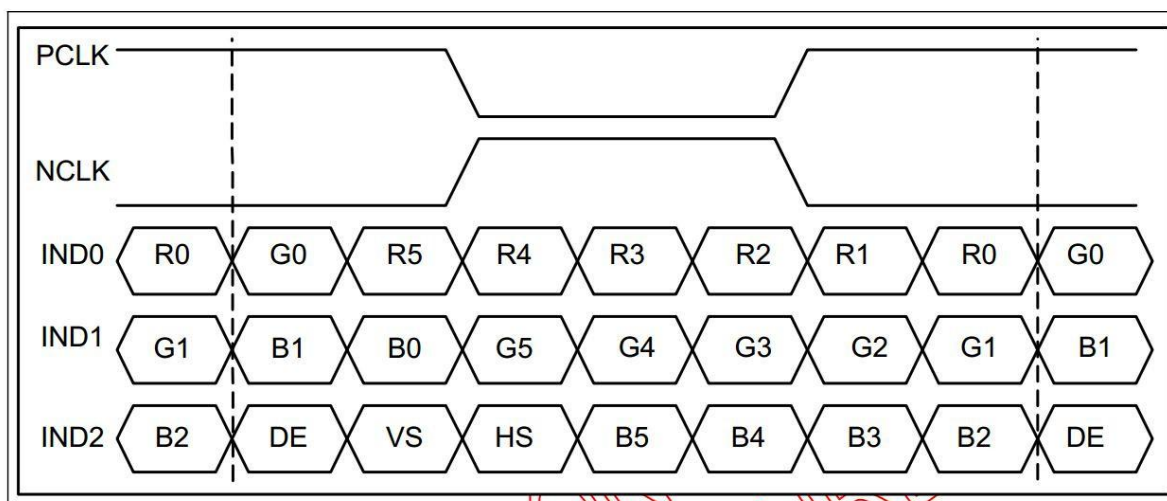
7.2 AC CHARACTERISTICS

LVDS mode

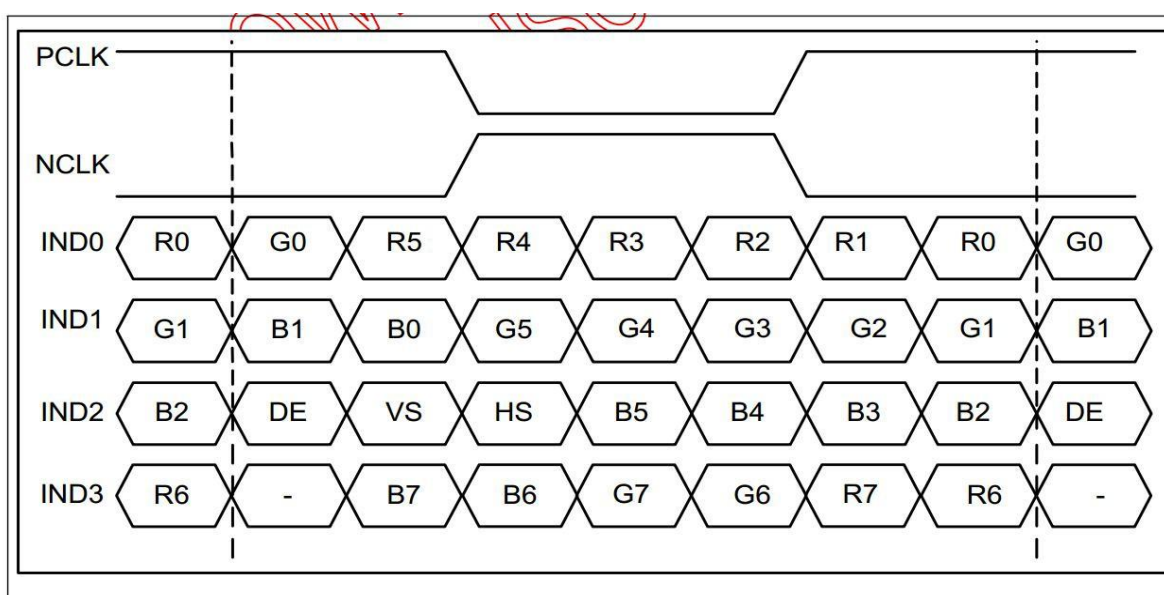
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Clock Frequency	RxFCLK		20	-	71	MHz
Input data skew margin	TRSKM	V _{DD} =400mV R _{xVCM} =1.2V RxFCLK=71MHz	500			ps
Clock High Time	TLVCH			4/(7* RxFCLK)		ns
						ns
Clock Low Time	TLVCL			3/(7* RxFCLK)		ns
PLL wake-up-time	T _{enPLL}				150	us

7.3 Bit LVDS INPUT

7.3.1 6bit LVDS input (SELB="1")



7.3.2 8BIT LVDS INPUT (SELB="0")



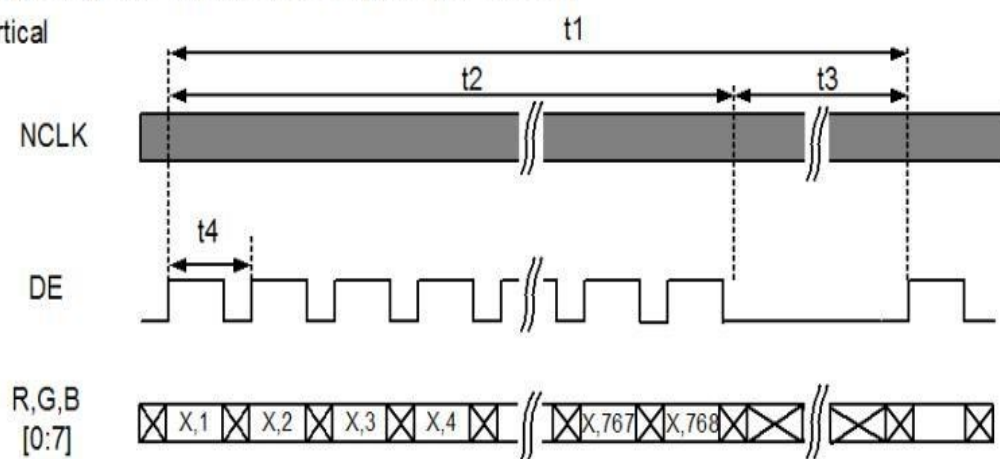
7.4 INTERFACE TIMING

DE mode

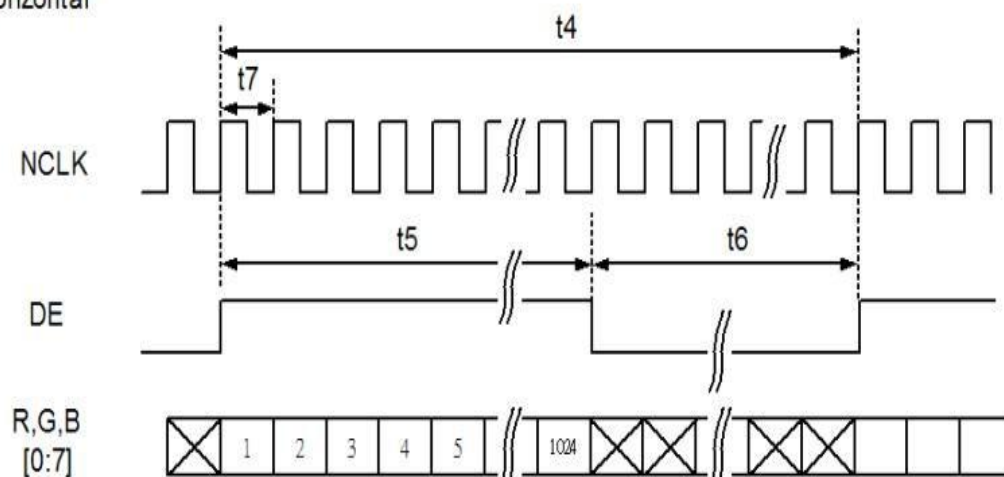
DE mode					
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60hz	fclk	52	65	71	Mhz
Horizontal display area	thd	1024			DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thbp+thfp	90	320	376	DCLK
Vertical display area	tvd	768			H
VSYNC period time	tv	778	806	845	H
VSYNC blanking	tvb+tvfp	10	38	77	H

Timing Diagram of Interface Signal (DE mode)

1. Vertical



2. Horizontal

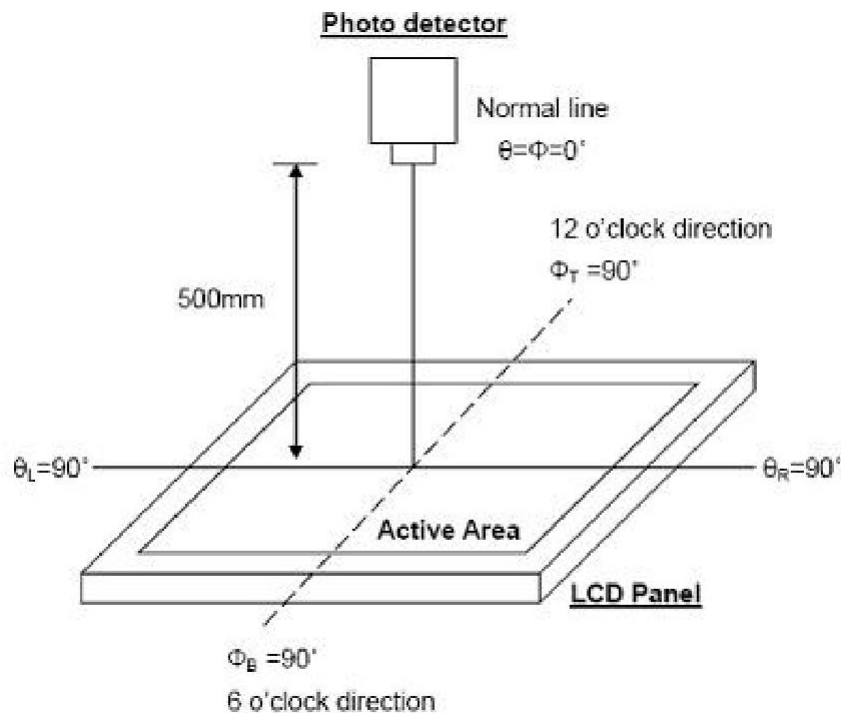


8. Optical Characteristics

Ta=25±2℃

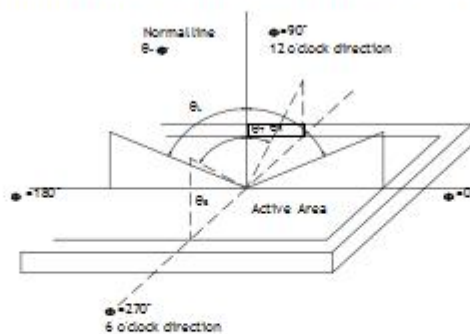
Item		Symbol	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	-	700	-		Note1 Note3
Luminance(center)		L	520	560	-	cd/m2	Note1 Note5 Note7
Luminous tolerance		LU	70	75		%	Note7
Response Time		Rising + Falling	-	30	35	ms	Note1 Note4
Viewing Angle K=Contrast Ratio>10	Horizontal	θx^{+}	80	85	-	degree	Note2
		θx^{-}	80	85	-		
	Vertical	θy^{+}	80	85	-		
		θy^{-}	80	85	-		
Color Chromaticity (CIE1931)	Red	x	Typ- 0.05	0.617	Typ+ 0.05		Note1 Note5 Note7
		y		0.327			
	Green	x		0.332			
		y		0.600			
	Blue	x		0.146			
		y		0.056			
	White	x		0.299			
		y		0.351			
Color gamut (NTSC ratio)				50		%	

Note1: Definition of optical measurement system (BM-7)



Note2: Definition of viewing angle range and measurement system

Viewing angle is measured at the center point of the LCD by CONOSCOPE (ergo-80).



Note3: Definition of Response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.

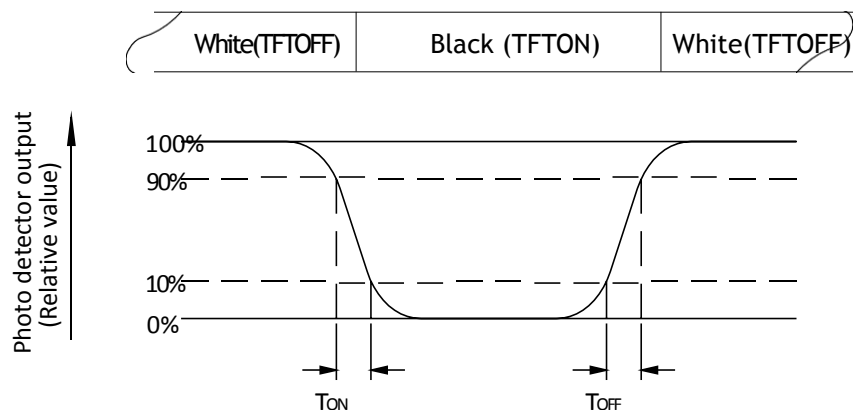


Fig. 6-3 Definition of response time

Note4: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the Whitestate}}{\text{Luminance measured when LCD on the Blackstate}}$$

“White state”: The state is that the LCD should drive by V_{white} .

“Black state”: The state is that the LCD should drive by V_{black} .

V_{white} : To be determined V_{black} : To be determined.

Note5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

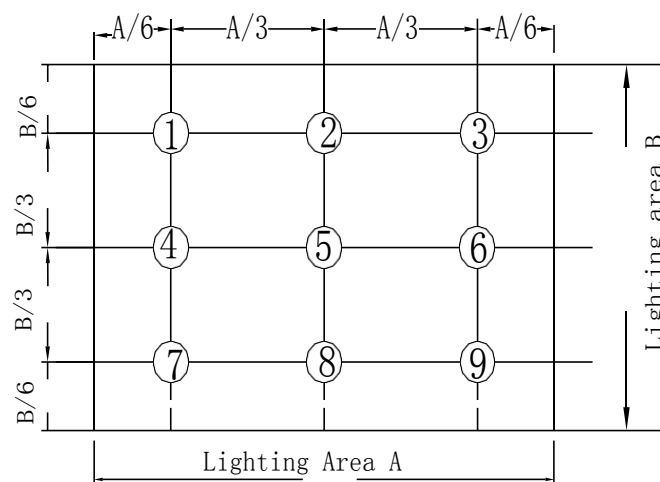
Note6: All input terminals LCD panel must be ground while measuring the center area of the panel. The LED driving condition is $I_L = 150\text{mA}$

Note7: Definition of Luminance Uniformity

Active area is divided into 9 measuring areas. Every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity (U)} = L_{min} / L_{max}$$

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



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

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

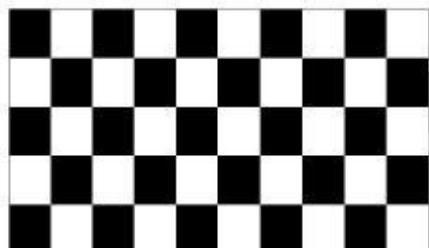
9. Environmental / Reliability Tests

9.1 TEMPERATURE AND HUMIDITY

Test Item	Test Condition	Remark
High Temperature Storage	Ta=80°C ; 120hrs	IEC60068-2-1: 2007 GB2423.2-2008
Low Temperature Storage	Ta=-30°C;120hrs	IEC60068-2-1: 2007 GB2423.1-2008
High Temperature Operation	Ta=70°C , 120Hrs	IEC60068-2-1: 2007 GB2423.2-2008
Low Temperature Operation	Ta=-20°C ; 120hrs	IEC60068-2-1: 2007 GB2423.1-2008
High Temperature High Humidity Operation	Ta=40 °C , 80%RH , 96Hrs(no condensation)	IEC60068-2-78: 2001 GB/T2423.3-2006
Thermal Shock	-20°C (0.5h) ~ 70°C (0.5h) / 50 cycles	Start with cold temperature , End with high temperature , IEC60068-2-14:1984,GB2423.22-2002
Image Sticking	25°C ; 1hrs	Note1

Note1:Condition of image sticking test :25°C±2°C

Operation with test pattern sustained for 1hrs,then change to gray pattern immediately.after 15 mins,the mura must be disappeared completely



(a) Test Pattern (chess board Pattern)



(b) Gray Pattern

9.2 VIBRATION&SHOCK

Test item	Conditions	Remark
Packing Shock (non-operation)	980m/s ² ,6ms, ±x,y,z 3times for direction	IEC60068-2-27: 1987 GB/T2423.5-1995
Packing Vibration (non-operation)	Frequency range:10 HZ~50HZ Stroke:1.0mm,sweep:10 HZ ~50HZ x,y,z 2 hours for each direction	IEC60068-2-32: 1990 GB/T2423.8-1995

9.3 ESD

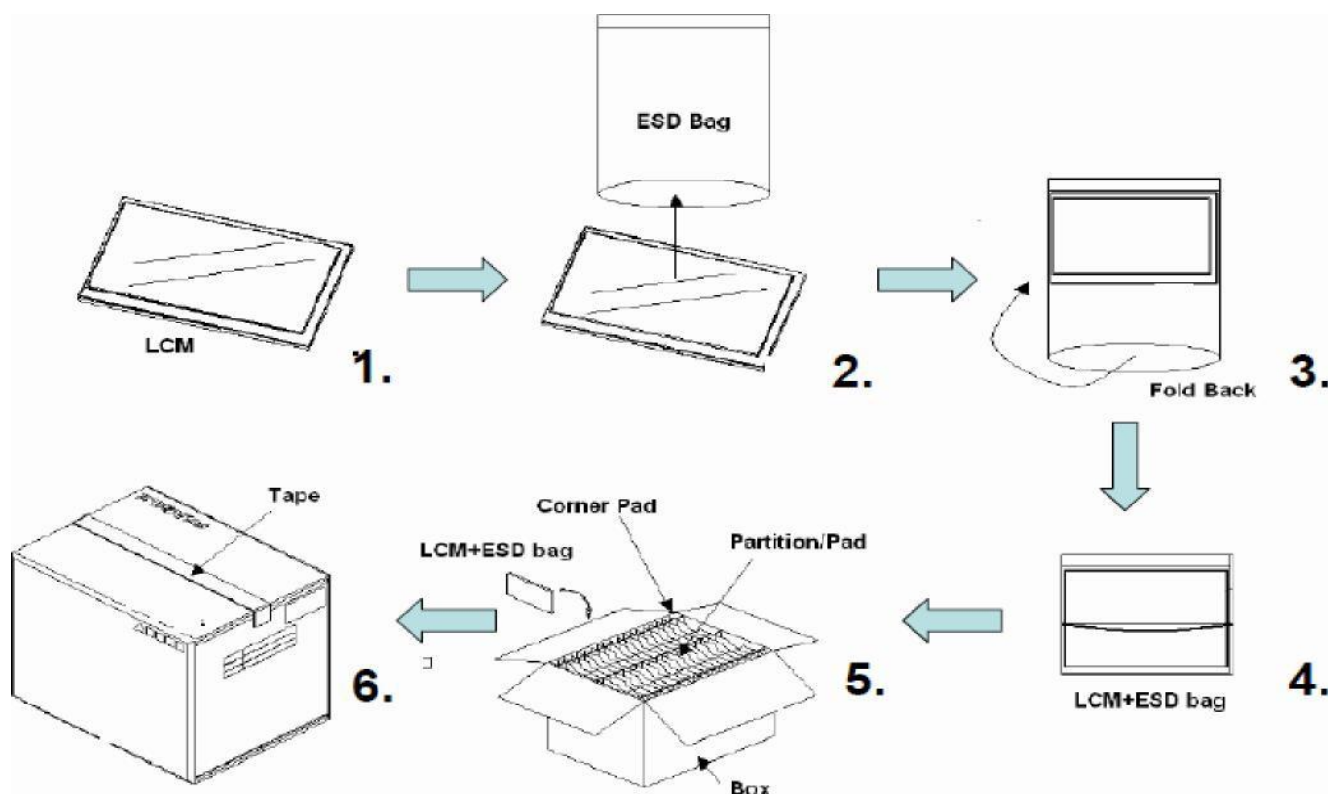
Test item	Conditions	Remark	
Electro Static Discharge Test (non-operation)	150pF, 330Ω, Contact:±4KV,Air:±8KV	1	Class C
	200pF, 0Ω, ±200V contact test	2	

Note: Measure point :

1. LCD glass and metal bezel
2. IF connector pins
3. ESD class C: To allow a temporary loss of function, the equipment to be measured may stop working but should be able to automatic or manual intervention reset back to normal after operation.

10. Packing

	40 pcs/box	483±5 x 318±5 x 240±5	
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Items	Material	Notice
Box	Corrugated Paper Board	AB Flute
Partition/Pad	Corrugated Paper Board	B Flute
Corner Pad	Corrugated Paper Board	AB Flute
ESD bag	PE	

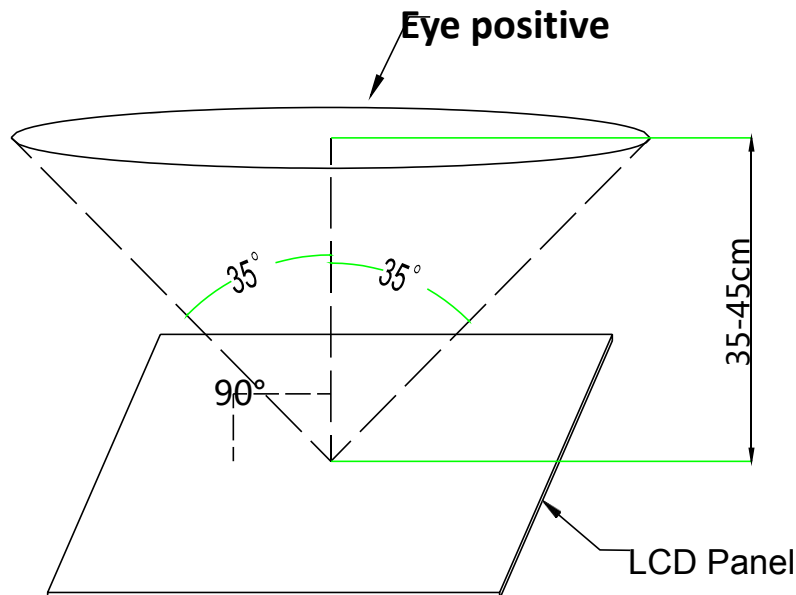
11. TFT-LCD Module Inspection Criteria

11.1 Incoming inspection right

- (1) The Incoming Inspection Standard will be agreed and signed by both sides (Customer and starry)

11.2 Inspection condition is as follows

- (2) Viewing distance is approximately 35~40 cm
- (3) Viewing angle is normal to the LCD panel as Fig-1 (35°)
- (4) Ambient temperature is approximately $25 \pm 5^{\circ}\text{C}$
- (5) Ambient humidity is $60 \pm 5\%\text{RH}$
- (6) Ambient illuminance is from 300~500 Lux
- (7) Input signal timing should be typical value
- (8) Mura & Light leakage inspection and ND-Filter 5%



11.3 Special condition

- (9) Viewing distance is close for inspection of adjacent dots and distance between defect Dots
- (10) Viewing condition of "Shot block non-uniformity from oblique angle" is as Fig-2
- (11) Exceptional case: View angle $\pm 40^{\circ}$ while inspected image-sticking

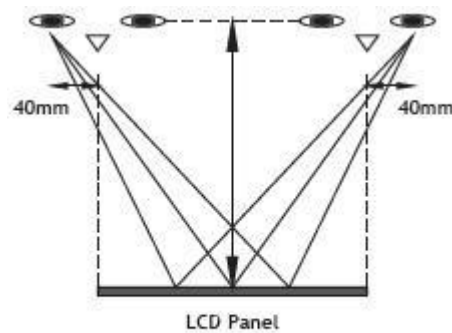
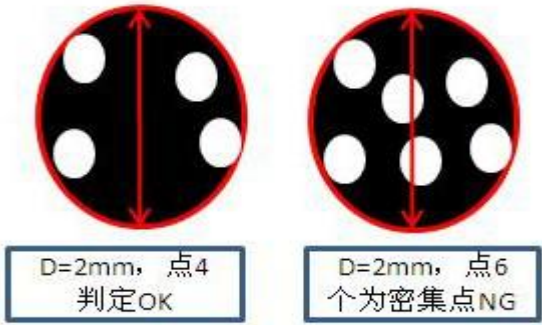


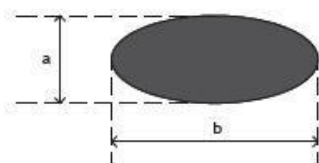
Fig-2

11.4 INSPECTION CRITERIA

Defecttype			Limit		Note	
Visual defect	Scratch		W≦0.05mm		Ignore	Note1
			0.05mm≦w≦0.1m		N≦3	
			L≦10mm			
			20mm < l, 0.1mm < w		N=0	
	Internal	Spot	Φ < 0.2mm		Ignore	Note 1
			0.2mm≦φ≦0.4mm		N≦3	
			0.4≦φ		N=0	
		Fiber	0.1mm≦w≦0.2m		N≦4	Note 1
			L≦2.5mm			
			0.2mm < w, 2.5mm < l		N=0	
		Polarizer bubble	Φ < 0.3mm		Ignore	Note 1
			0.25mm≦φ≦0.5mm		N≦2	
			0.5≦φ		N=0	
		Dent	Φ < 0.25mm		Ignore	Note 1
			0.25mm≦φ≦0.5mm		N≦4	
			0.5≦φ		N=0	
Electrical Defect	Bright dot		C area	O area	Total	Note 2 Note 3
			N≦1	N≦2	N≦3	
	Dark dot		N≦2	N≦4	N≦4	use of ND5 % invisible OK
	Total dot		N≦3	N≦4	N≦4	

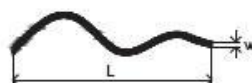
	Dense point	Using ND5 % visible by intensive foreign standard judgement, ND5 % invisible OK 	Note 4
(1) One pixel consists of 3 sub-pixel, including r, g, and b dot. (sub-pixel=dot) (2) Panel is acceptable if distance between 2 dot defects are greater or equal to 5mm.			

Note1 : W : Width[mm], L : Length[mm], N : Number, ϕ : Average Diameter



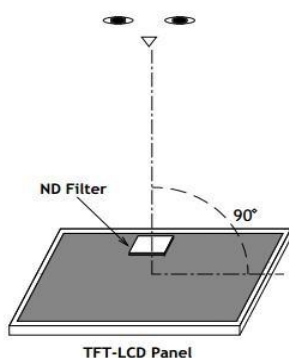
$$\phi = (a+b)/2$$

1. (White, Black) Spot
2. Polarizer Bubble

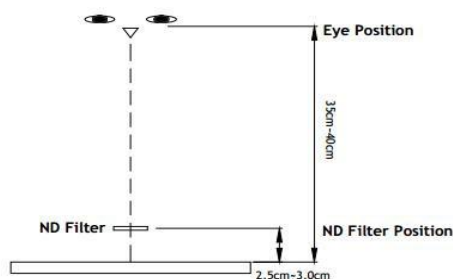


Scratch & Fiber

1/2, 1/5

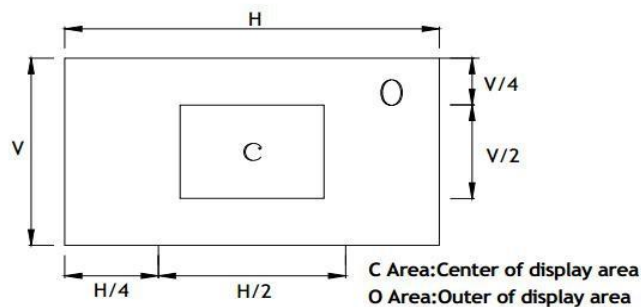


TFT-LCD Panel

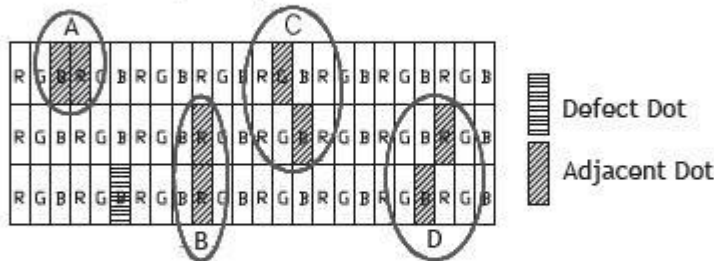


TFT-LCD Panel

Note3 :



Note4 : Judge defect dot and adjacent dot as following. Allow below (as A, B, C and D status) adjacent defect dots, including bright and dark adjacent dot. And they will be counted 2 defect dots in total quantity.



Note5 : Other condition

- (1) The defects that are not defined above and considered to be problem shall be reviewed and discussed by both parties.
- (2) Defects on the Black Matrix, out of Display area, are not considered as a defect or counted.

12. Precautions for Use of LCD modules

- (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)
- (8) The Period within 12 months since the date of shipping out under normal using And Storage conditions. (从出货 日开始,在正常使用和存储条件下,产品保质期为 12 个月)