深圳市华科百誉科技有限公司

APPROVAL SHEET

承 认 书

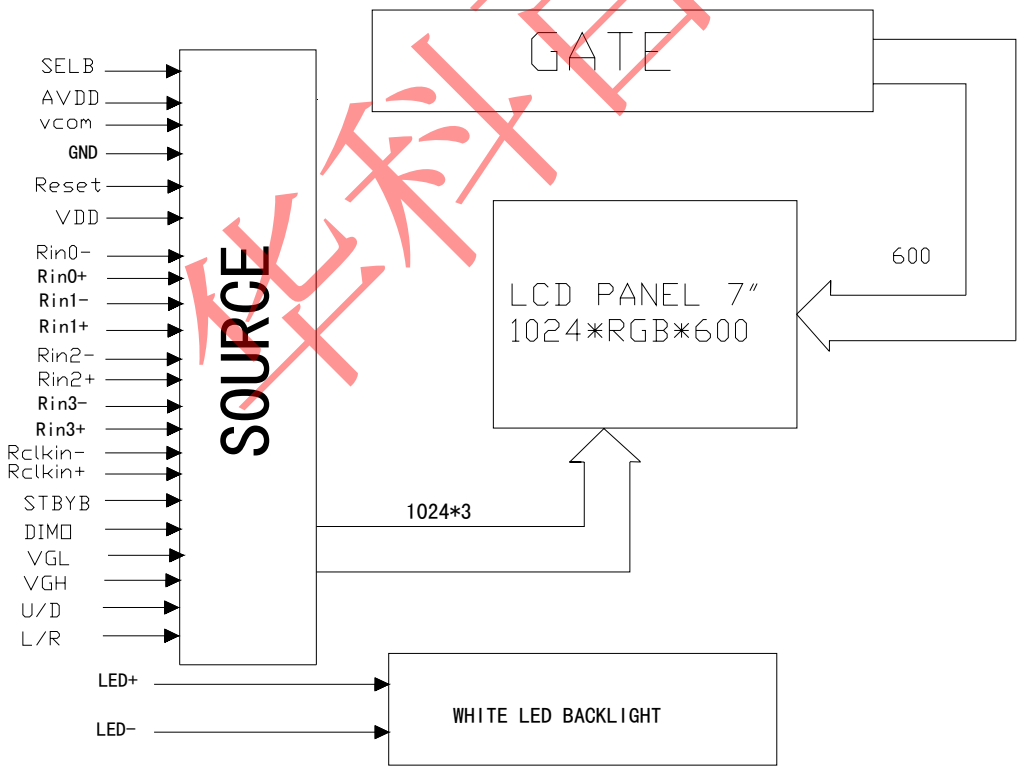
Customer 客户名称	
Part NO. 产品型号	TG78540B-B8
Product type 产品内容	Mode: Transmissive type .Normally white. TFT LCD Module LCD Module: Graphic 1024RGB*600Dot-matrix
Remarks 备注栏	□APPROVAL FOR SEPCIFICATIONS ONLY ■APPROVAL FOR SEPCIFICATIONS AND SAMPLE
Signature by Customer: 客户确认签章	

Issued by	Checked by	Approved by

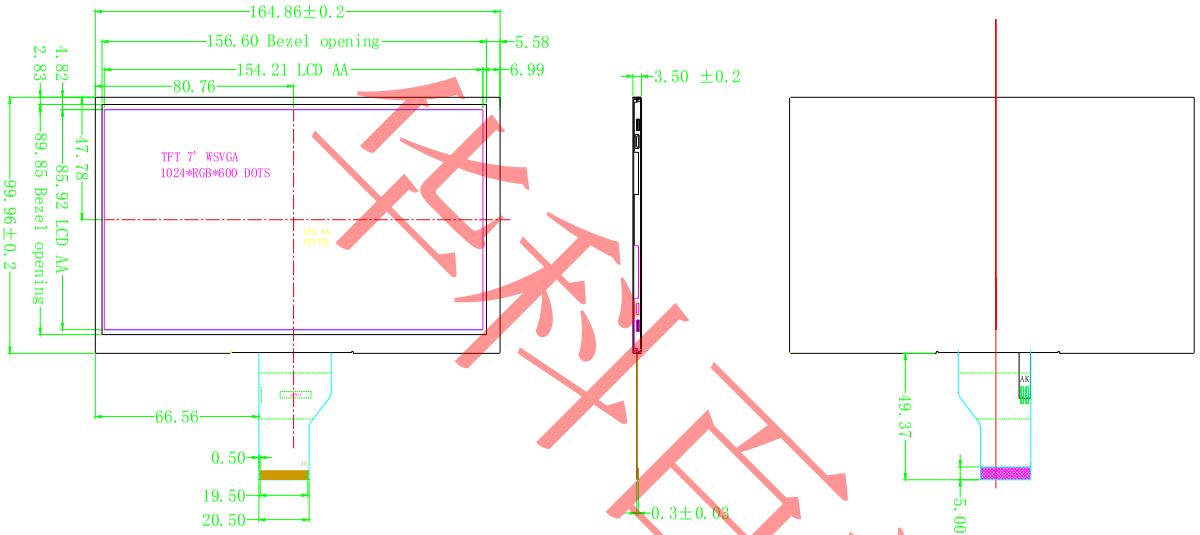
1. PHYSICAL DATA

Item	Contents	Unit
LCD type	TFT TRANSMISSIVE	---
Viewing direction	6	o'clock
Module size (W×H×T)	165 × 100 × 3.5	mm^3
Active area(W×H)	154.2144×85.92	mm^2
Number of dots(W×H)	1024(RGB) × 600	dots
Pixel Pitch(W×H))	0.1506×0.1432	mm
Driver IC	EK79001	---
Colors	16.7M	---
Backlight Type	27 white leds 9.6V /180mA	---
Interface Type	LVDS	---

2. BLOCK DIAGRAM



3. Mechanical Dimension

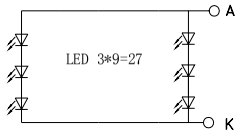


NO.	Pin name	NO.	Pin name
1	VCOM	33	L/R
2	VDD	34	U/D
3	VDD	35	VGL
4	NC	36	NC
5	RESET	37	NC
6	STBYB	38	VGH
7	GND	39	LED+
8	RinO-	40	LED+
9	RinO+		
10	GND		
11	Rin1-		
12	Rin1+		
13	GND		
14	Rin2-		
15	Rin2+		
16	GND		
17	Rclkin-		
18	Rclkin+		
19	GND		
20	Rin3-		
21	Rin3+		
22	GND		
23	NC		
24	NC		
25	GND		
26	NC		
27	NC		
28	SELB		
29	AVDD		
30	GND		
31	LED-		
32	LED-		

* Unspecified Tolerances is: ±0.2

Note:	
LCD TYPE	7 inch TFT Transmissive
DISPLAY MODE	Normally white
VIEW DIRECTION	6 O'clock
OPERATING TEMP.	-10° C ~ 50° C
STORAGE TEMP.	-20° C ~ 60° C
BACK LIGHT	27 White leds
BL voltage/current	9.6V / 180mA
ALL MATERIALS MUST BE ROHS COMPLIANT	

BACKLIGHT CIRCUIT



UNIT: mm	SCALE:NO SCALE	SIZE: A4	PRJ(3)		
GENERAL TOLERANCE:	±0.2 Angle=1°				
DESIGNED:	czs	Date 2017-12-11	PART NAME	MODULE DRAWING	
CHECKED:		Date	PROJECT NO.	TG78540B-B8	SHEET: 1/1
APPROVED:		Date	PART NO.		REV: A

4. Pin Descriptions

Pin No.	Symbol	Functional	Notes
1	VCOM	Common Voltage	
2~3	VDD	Power Supply for digital circuit	
4	NC	No connection	
5	RESET	Global reset pin	
6	STBYB	Standby mode, Normally pulled high	
7	GND	Ground	
8	Rin0-	-LVDS differential data input	
9	Rin0+	+LVDS differential data input	
10	GND	Ground	
11	Rin1-	-LVDS differential data input	
12	Rin1+	+LVDS differential data input	
13	GND	Ground	
14	Rin2-	-LVDS differential data input	
15	Rin2+	+LVDS differential data input	
16	GND	Ground	
17	RclkIN-	-LVDS differential clock input	
18	RclkIN+	+LVDS differential clock input	
19	GND	Ground	
20	Rin3-	-LVDS differential data input	
21	Rin3+	+LVDS differential data input	
22	GND	Ground	
23-24	NC	No connection	
25	GND	Ground	
26	NC	No connection	
27	NC	No connection	
28	SELB	6bot/8bit mode select ， L=8 BIT ， H=6BIT	
29	AVDD	Power for Analog Circuit	
30	GND	Ground	
31-32	LED-	LED Cathode	
33	L/R	Horizontal inversion	
34	U/D	Vertical inversion	
35	VGL	Gate OFF Voltage	
36	NC	No connection	
37	NC		
38	VGH	Gatr ON Voltage	
39-40	LED+	LED Anode	

5. ABSOLUTE MAXIMUM RATINGS

(GND=AGND=0V)

Parameter	Symbol	Min	Max	Unit
Power supply1	V_{DD}	-0.5	+3.96	V
Power supply2	Avdd	-0.5	+13.85	V
Operating temperature	T_{OPR}	-10	50	℃
Storage temperature	T_{STG}	-20	60	℃

Input voltage for BOE LCD at temperature 25℃

VGH	18V
VGL	-6V
AVDD	9.6V
VCOM	3.8V

Note: Please adjust Vcom to make the flicker level be minimum

6. DC ELECTRICAL CHARACTERISTICS FOR LVDS

LVDS DC characteristic

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Differential input high threshold voltage	RxVTH			+0.1V	V	RxVCM=1.2V
Differential input low threshold voltage	RxVTL	-0.1			V	
Input voltage range(single-end)	RxVIN	0		2.4	V	
Differential input common mode voltage	RxVCM	$\|V_{ID}\|/2$		2.4 -$\|V_{ID}\|/2$	V	
Differential input voltage	$\|V_{ID}\|$	0.2		0.6	V	
Differential input leakage current	RxVTH	-10		+10	V	
LVDS Digital Operating Current	Iddlvsd	-	40(TBD)	50	mA	Fclk=65Mhz, VDD=3.3V
LVDS Digital Standby Current	Istlvds	-	10(TBD)	50	uA	Clock & all functions are stop

7. LVDS MODE AC ELECTRICAL CHARACTERISTICS

(Detail please refer IC data sheet)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Clock Frequency	RxFCLK		20	-	71	MHz
Input data skew margin	TRSKM	|VID|=400mV RxVCM=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	TenPLL				150	us

8. Data input format for LVDS

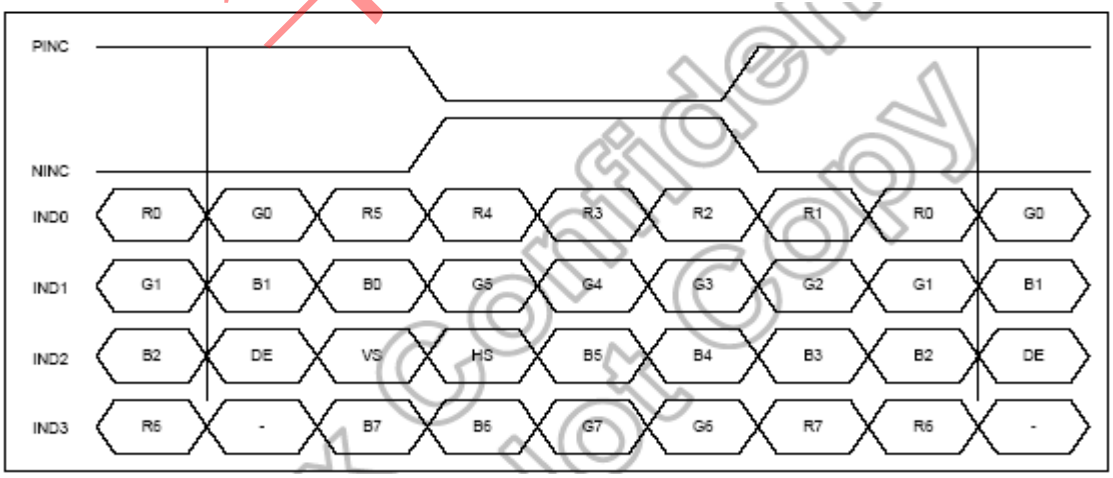
8.1 Timer characteristic

DE mode

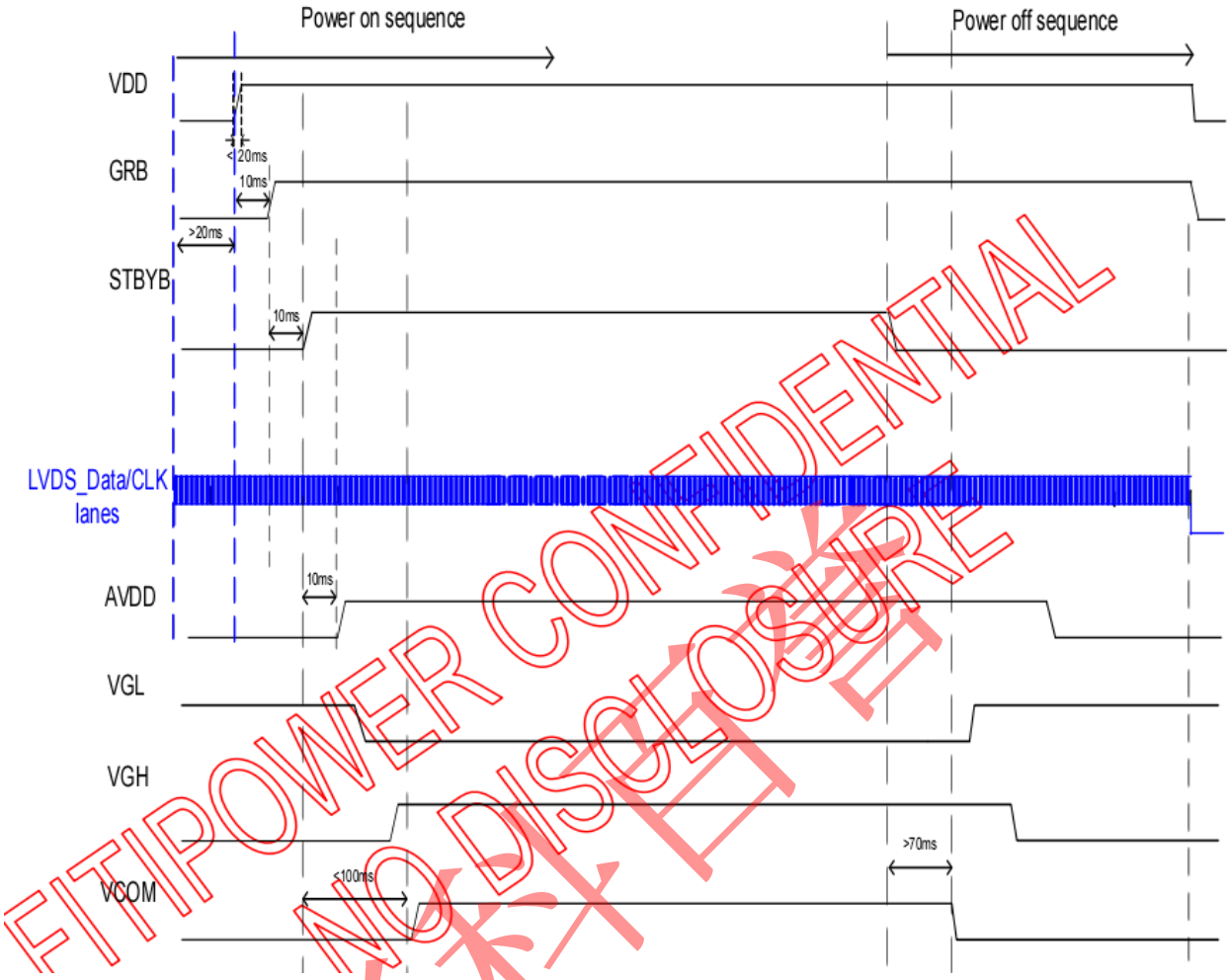
DE mode					
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60hz	fclk	40.8	51.2	67.2	Mhz
Horizontal display area	thd		1024		DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd		600		H
VSYNC period time	tv	610	635	800	H
VSYNC blanking	tvb+tvfp	10	35	200	H

8.2 For 6-Bit LVDS input

8.3 For 8-bit LVDS input



8.4 Power on/off timing sequence for LVDS interface



9. Backlight Characteristic

Item	Symbol	Min	Typical	Max	Unit
LED module Forward voltage	**V_{LED}**	**--**	**9.6**	**--**	**V**
LED module current	**I_{LED}**	**--**	**180**	**--**	**mA**
L/G Surface Luminance ★1	**L_S**	**--**	**tbd**	**--**	**mcd**
LCM Surface brightness uniform ★2	**L_D**	**80**	**--**	**--**	**%**

★ 1 Test condition is:

(a) Center point on active area.

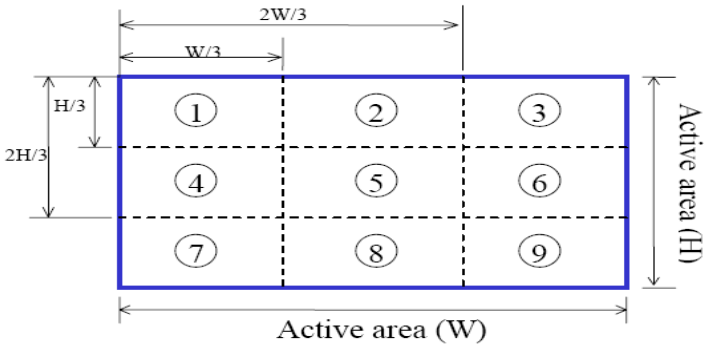
(b)Best Contrast.

★2 Uniform measure condition:

(1)Measure 9 point. Measure location show below;

(2)Uniform=(Min. brightness /Max. brightness)*100%

(3)Best Contrast.



10.Electro-optical Characteristics

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angle range	Hor.	ϕ 3	CR≥10	60	70		Deg.	
		ϕ 9		60	70		Deg.	
	Ver.	ϕ 12		50	60		Deg.	
		ϕ 6		60	70		Deg.	
Color gamut(C light)					50		%	
Luminance Contrast ratio		T(%)	ϕ 0°	600	800			
Response Time		TRT	Temp=25° C		25	40	ms	

11. Reliability

11.1 Mtbf

The LCD module shall be designed to meet a minimum MTBF value of 50000 hours with normal

11.2 Test condition

NO.	ITEM	CONDITION	CRITERION
1	High Temperature Non-Operating Test	60℃*240Hrs	。No Defect Of Operational Function In Room Temperature Are Allowable 。IDD of LCM in Pre-and Post-Test Should Follow Specification
2	Low Temperature Non-Operating Test	-20℃*240Hrs	
3	High Temperature/Humidity Non Operating Test	60℃*90%RH*240Hrs	
4	High Temperature Operating Test	50℃*240Hrs	
5	Low Temperature Operating Test	-10℃*240Hrs	
6	Thermal Shock Test	-10 ℃ (30Min)- 50 ℃ (30Min) *10CYCLES	

Notes:

1. Judgments should be made after exposure in room temperature for two hours.
2. The distill water is used for the high temperature/humidity test.

3. The sample above is individually for every reliability tests condition.

12. Inspection standards

1.AQL(Acceptable Quality Level

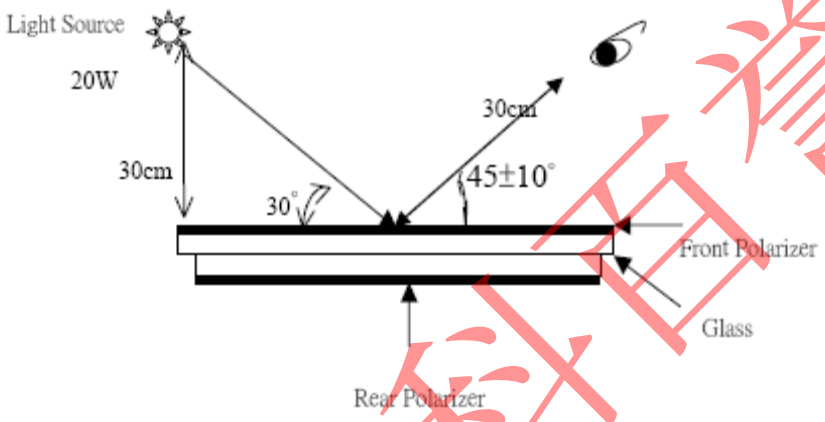
AQL of major and minor defect.

	MAJOR DEFECT	MINOR DEFECT
AQL	0.65	1.5

2. Basic conditions for inspection

The LCM face to us, in normal environment, the lux is 1000±200.(Darkroom's lux: 100±50),About an angle of incidence 30,a distance of 30 cm with an angle of 45 degree to check the products without uncovering the film!

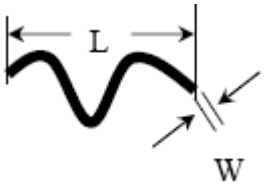
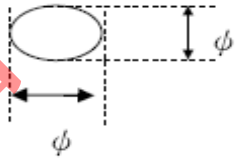
(As shown below)



3.Inspection item and criteria

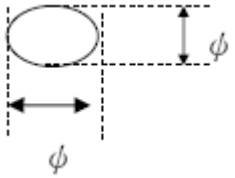
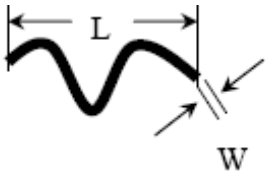
3.1 Visual inspection criterion in immobility

3.1.1LCD appearance defect(View area)

NO	Defect item	Criteria		Remark
1	Fiber、glass cratch、polarizer scratch/folded (minor defect)	Specification	Allowable	note1:L: Length, W: Width note2: disregard if out of AA 
		W≦0.03mm	disregard	
		0.03mm<W≦0.05mm; L≦3.0mm	2	
		0.05mm<W≦0.1mm; L≦3.0mm	1	
		W>0.1mm;L>3.0mm	0	
2	Polarizer bubble、concave and convex (minor defect)	Φ≦0.2mm	disregard	note1: Φ=(L+W)/2, L:Length, W :Width note2:disregard if out of AA
		0.2mm<Φ≦0.3mm	2	
		0.3mm<Φ≦0.5mm	1	
		0.5mm<Φ	0	
3	Black dots、dirty dots、impurities、eye winker (minor defect)	Φ≦0.15mm	disregard	note2:disregard if out of AA 
		0.15mm<Φ≦0.25mm	2	
		0.25mm<Φ≦0.3mm	1	
		0.3mm<Φ	0	
4	Polarizer prick (minor defect)	Φ≦0.1mm	disregard	note1: Φ=(L+W)/2, L=Length, W=Width note2:the distance between two dots>5mm
		0.1mm<Φ≦0.25mm	3	
		Φ>0.25mm	0	

3.2Electrical criteria

NO	Defect item	Criteria	Remark
1	No display	No display	

	(major defect)	【Reject】		
2	Missing line (major defect)	Missing line 【Reject】		
3	Seg-com light and dark (major defect)	Seg-com light and dark 【Reject】		ND filter 2% test
4	No display in immobility (major defect)	No display in immobility 【Reject】		
5	Flicker of Pattern (major defect)	Flicker of Pattern 【Reject】		
6	Mura (major defect)	ND filter 2%test		
7	Over current (major defect)	Over current 【Reject】		
8	Voltage out of specification (major defect)	Voltage out of specification 【Reject】		
9	Pattern blur, error code (major defect)	Pattern blur, error code 【Reject】		
10	Dark light, Flicker (major defect)	Dark light, Flicker 【Reject】		
11	Black/white dots 、 Dirty dots、eye winker (major defect)	Specification	Allowable	Note1:disregard if out of AA 
		ф ≦0.15mm	disregard	
		0.15mm< ф ≦0. 25mm	2	
		0.25mm< ф ≦0. 3mm	1	
		0.3mm< ф	0	
12	Fiber、glass crutch、Polarizer scratch/folded (major defect)	W≦0.03mm	disregard	Note1:L: Length, W: Width Note2: disregard if out of AA 
		0.03mm<W≦0. 0. 05mm L≤3. 0mm	2	
		0.05mm<W≦0. 1mm L≤3. 0mm	1	
		W>0.1mm;L>3.0mm	0	

13.Precautions for using LCD modules.

13.1 Safety

(1)Do mot swallow any liquid crystal ,even if there is no proof that liquid crystal is poisonous.

(2)If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
(3)If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

13.2 Storage Conditions

(4)Store the panel or module in a dark place where the temperature is 23±5℃and the humidity is below 45±20%RH.
(5)Store in anti-static electricity container.
(6)Store in clean environment, free from dust, active gas, and solvent.
(7)Do not place the module near organics solvents or corrosive gases.
(8))Do not crush, shake, or jolt the module.

13.3Handling Precautions

(9)Avoid static electricity, which can damage the CMOS LSI.
(10)The polarizing plate of the display is very fragile, please handle if very carefully.
(11)Do not give external shock.
(12)DO mot apply excessive force on the surface.
(13)Bo not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
(14)Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
(15)Do not operate it above the absolute maximum rating.
(16)Do not remove the panel or frame from the module.

13.4 Warranty

The period is within twelve months since the date of shipping out under normal using and storage conditions.