



AG480272R43 液晶说明书

深圳市创盛安显示有限公司

AG480272R43

版本: V1.0

RGB 型彩色液晶模块使用说明书

尺寸: 4.3 inch

点阵: 480X272

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1. GENERAL DESCRIPTION

The ZBH043GT-08 is a 480(RGB)X272 dot-matrix TFT module. This module can be easily accessed by RGB interface, and is suitable for small mobile products as MP4.

2. FEATURES

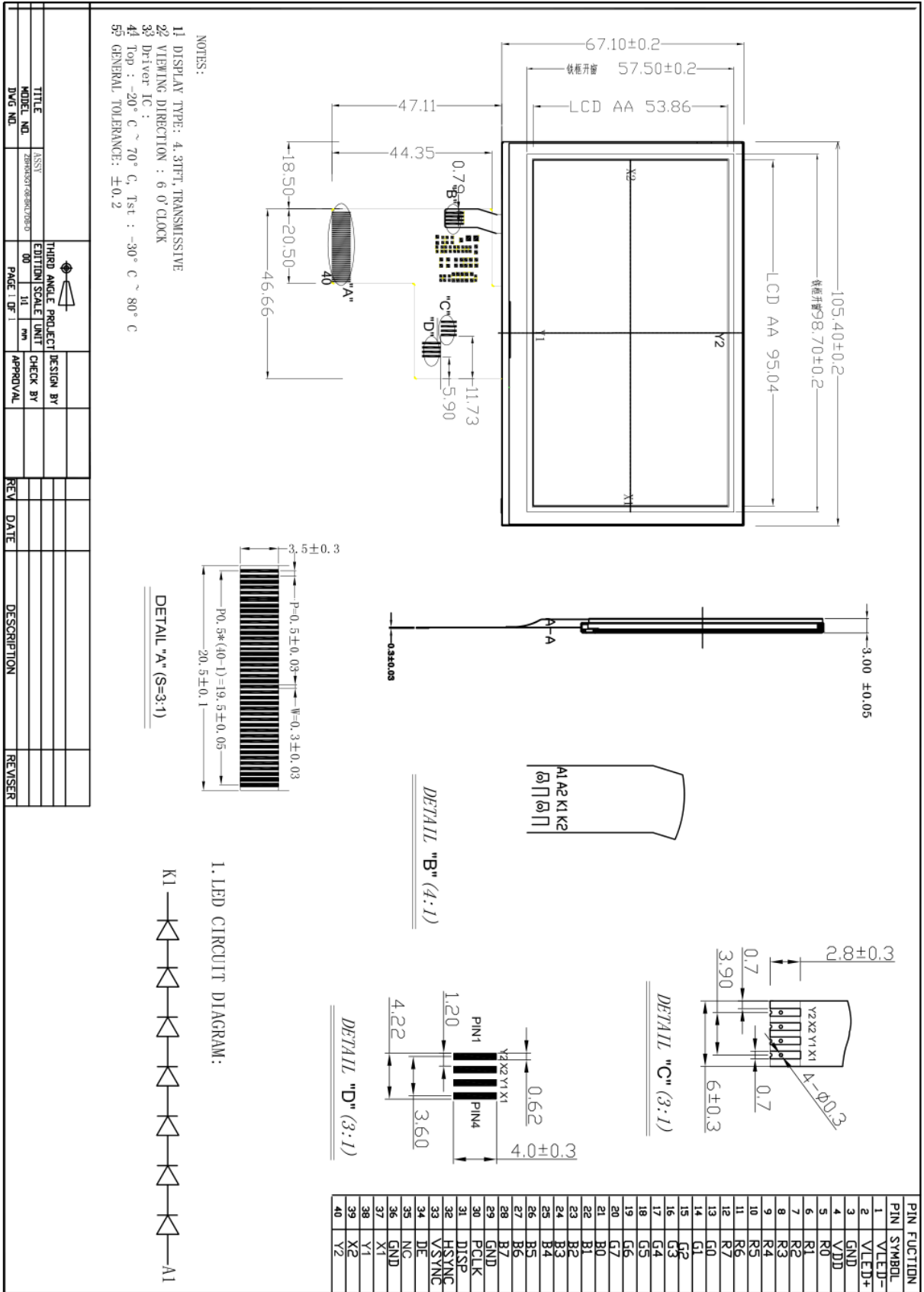
Display Mode	TFT LCD module
	Active matrix TFT ,Transmissive type
Display Format	RGB Stripe
Color	16.7M color
Input Data	24 bits RGB interface
Viewing Direction	6 O'CLOCK
Backlight	White LED
Driver IC	OTA5180A-C3

3. MECHANICAL SPECIFICATION

Item	Specifications	Unit
Dimensional outline	105.4(W)×67.1(H)×3.00(D)	mm
Number of Pixel	480RGB×272	Pixel
LCD A.A	95.04(W)×53.86(H)	mm
Pixel Pitch	0.198(W)×0.198(H)	mm



4. MECHANICAL DIMENSION





5 ELECTRICAL CHARACTERISTICS

5.1 DC Characteristics

ITEM	SYMBOL	CONDITIONS	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
Logic power supply voltage	VDD	Ta= +25°C	3.0	3.3	3.6	V
Input high voltage	VIH	—	0.8 VDD	—	VDD	V
Input low voltage	VIL	—	Vss	—	0.2 VDD	V
Clock frequency	fCLK	—	--	9	15	MHz

NOTE:

For parallel RGB interface, maximum clock frequency is 15MHz.

5.2 Back-Light unit

PARAMETER	SYMBOL	REMARK	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
Forward voltage	VF	If =20mA	21	23.1	23.8	v
LUMINOUS INTENSITY(INCLUDE LCD)	Iv	If =20mA	190	210		cd/m2
Luminous tolerance	Iv-m	(min/max)/100	-	80	-	%
Chromaticity coordinates	X	If =20mA	0.250	-	0.290	
	Y		0.250	-	0.290	
Operating temperature			-20°C ~ 70°C			
Storage temperature			-30°C ~ 80°C			

5.3 AC Characteristics

Refer to OTA5180A-C3 data sheet.



7. MODULE FUNCTION DESCRIPTION

7.1 PIN Description

Pin No	Symbol	Function
1	VLED-	BACK LIGHT POWER GROUND
2	VLED+	BACK LIGHT POWER SUPPLY
3	GND	POWER GROUND
4	VDD	POWER SUPPLY
5-12	R0-R7	RED DATA
13-20	G0-G7	GREEN DATA
21-28	B0-B7	BLUE DATA
29	GND	POWER GROUND
30	PCLK	In external interface mode, served as a dot clock signal.
31	DISP	standby mode control pin
32	HSYNC	In external interface mode, served as a horizontal synchronized signal input
33	VSNC	In external interface mode, served as a vertical synchronize signal input
34	DE	In external interface mode, polarity of ENABLE signal is synchronized with valid graphic data input.
35	NC	NC
36	GND	POWER GROUND
37	X1	TOUCH PANEL CONTROL PIN
38	Y1	
39	X2	
40	Y2	

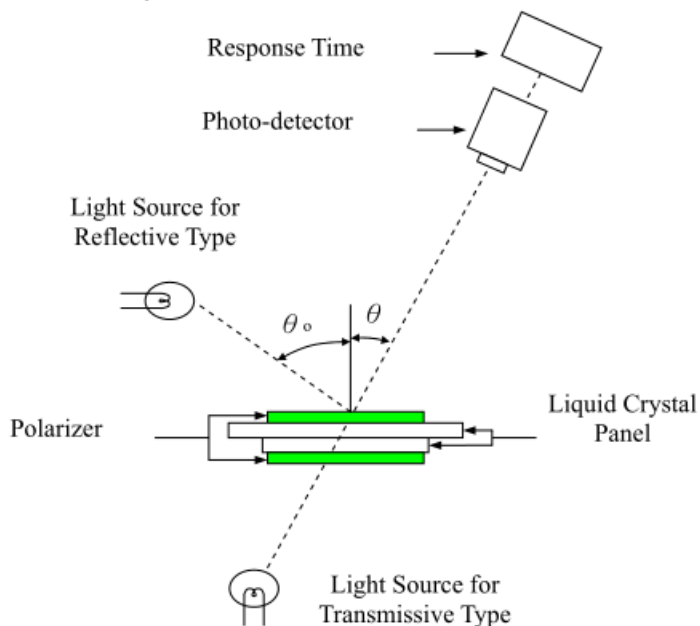
8. ELECTRO-OPTICAL CHARACTERISTICS



Electro-Optical Characteristics									
Item	Symbol	Condition	Temp.	Min.	Typ.	Max.	Units	Note	
Viewing Angle Range	θ	$\psi = 0^\circ$ $\psi = 90^\circ$ $\psi = 180^\circ$ $\psi = 270^\circ$ (CR ≥ 10)	25°C	----	55	----	degree	Note 2	
				----	65	----			
				----	55	----			
				----	65	----			
Response Time	Rise Time (Tr)	$\theta = \psi = 0^\circ$ $\theta_0 = 25^\circ$	25°C	----	12	----	msec	Note 1,4	
	Fall Time (Tf)			----	13	----			
Module Chromaticity	White	x	$\theta = \psi = 0^\circ$	25°C	----	----	---	Note 3	
		y			----	----			----
	Red	x			----	----			----
		y			----	----			----
	Green	x			----	----			----
		y			----	----			----
	Blue	x			----	----			----
		y			----	----			----
Module Contrast Ratio	CR	$\theta = \psi = 0^\circ$	25°C		----		---	Note3, 5	

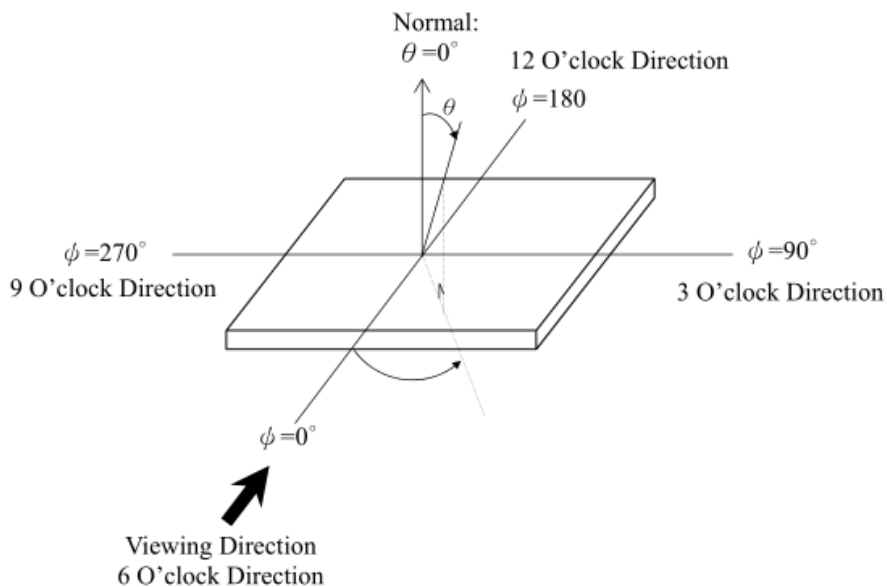


Note 1: Electro-Optical Characteristics Test Method.



Note 2: Definition of Viewing Angel.

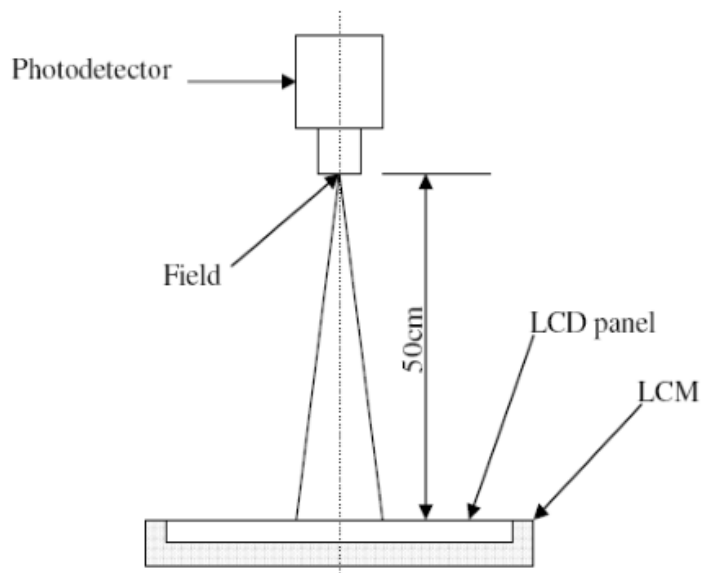
Viewing angle is the angle at which the contrast ratio is greater than 2, for TFT module the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface.





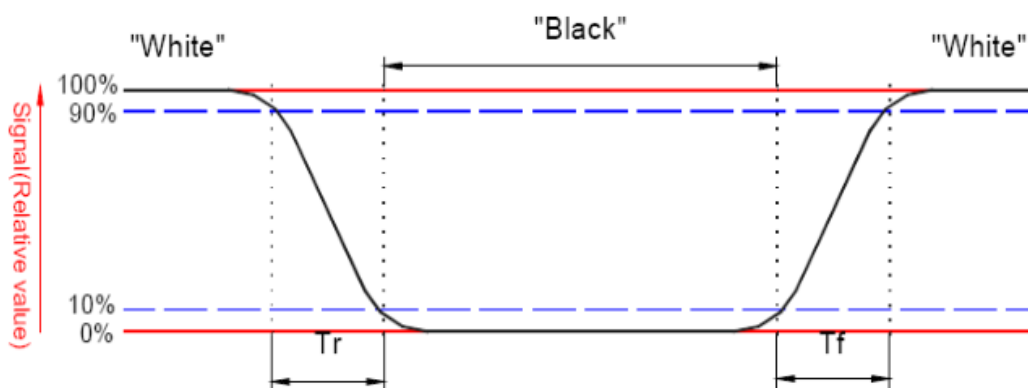
Note 3: Optical measurement equipment setup

- Measurement should be executed in a stable, windless, and dark room. After lighting the backlight for 30mins.
- Environment condition : Common air conditioner cleanness Ta=25±5
Humidity=60±15%
- Distance : 50cm
- Photodetector : BM-7 (Field 1°)



Note 4: Definition of Optical Response Time

The output signals of photo detector are measured when the input signals are changed from "black" to "white"(falling time) and from "white" to "black"(rising time), respectively. The response time is defined as the time interval between the 10% and 90% of amplitudes. Refer to figure as below:



**Note 5: Definition of Contrast Ratio (CR).**

Contrast ratio is calculated with the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Photo detector output when LCD is at "White" state}}{\text{Photo detector output when LCD is at "Black" state}}$$

9. RELIABILITY**9.1. 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)

9.2. Test condition

NO.	ITEM	CONDITION	CRITERION
1	High Temperature Non-Operating Test	80°C * 240Hrs	◦ No defect of operational functions in room temperature are allowable. ◦ IDD of LCM should be below specification.
2	Low Temperature Non-Operating Test	-30°C * 240Hrs	
3	High Temperature/Humidity Operating Test	50°C * 90±5%RH * 96Hrs	
4	High Temperature Operating Test	70°C * 240Hrs	
5	Low Temperature Operating Test	-20°C * 240Hrs	
6	Thermal Shock Test	-30°C(30Min)↔80(30Min)* 10 Cycles	
7	ESD Test	Air discharge:±6KV Contact discharge:±4KV	

Notes:

1. Judgments should be made after exposure in room temperature for two hours.
2. The pure water is used for the high temperature / humidity test.
3. The sample above is individually for every reliability tests condition.



10. INSPECTION CRITERIA

10.1 AQL(Acceptable Quality Level)

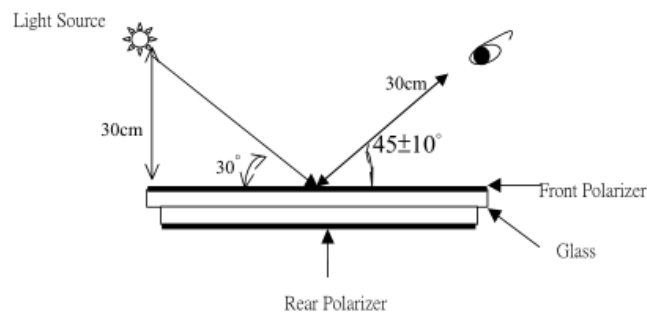
AQL of major and minor defect

	MAJOR DEFECT	MINOR DEFECT	MAJOR+MINOR
APPEARANCE	0.40%	1.0%	1.0%
ELECTRIC-OPTICAL	0.15%	0.15%	0.15%

10.2 Basic conditions for inspection

The LCM face to us, According to the criteria of luminance measurement instruction, About an angle of incidence 30,a distance of 30 cm with normal eye.with an angle of 45 degree to check the products without uncovering the film!

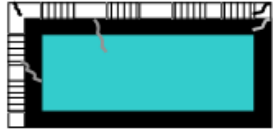
(As shown below).



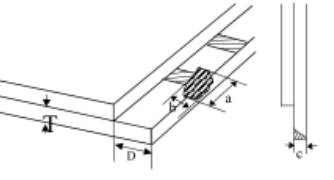
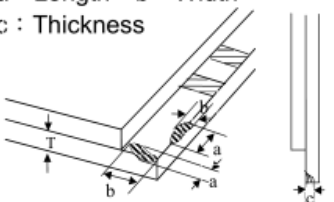
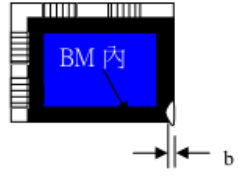
10.3 Inspection item and criteria

10.3.1 Visual inspection criterion in immobility

10.3.1.1 Glass defect

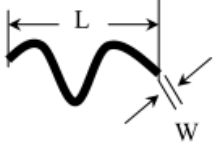
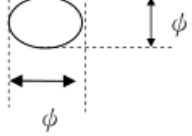
No	Defect item	Criteria	Remark
1	Dimension Unconformity (Major defect)	By Engineering Drawing	
2	Cracks (Major defect)	1)Not-extended crack according to the limit sample 2) Extended crack when $C \leq T$ and the crack touch $\leq 1/3$ sealant width is OK	



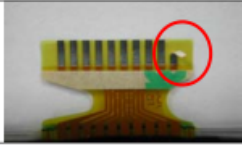
3	<p>Glass extrude the conductive area (minor defect)</p>	<p>a: disregards and no influence assemblage 1) $b \leq 1/3$ Pin width (non bonding area) 【Accept】 2) bonding area $\leq 0.5\text{mm}$ 【Accept】</p>	<p>a:Length, b:Width</p>
4	<p>Pin-side , conductive area damaged (minor defect)</p>	<p>(a c : disregards) $b \leq 1/3$ of effective length for bonding electrode 【Accept】</p>	<p>a : Length , b : Width , c : Thickness</p> 
5	<p>Pin-side , non-conductive area damaged (minor defect)</p>	<p>1) Damage area don't touch the ITO (Including contraposition mark, except scribing mark) 【Accept】 2) $c < T$ $b \leq \text{BM } 1/3$ of width 【Accept】 3) $c = T$ b not touch the seal glue 【Accept】 4) a disregards</p>	<p>a : Length , b : Width , c : Thickness</p> 
6	<p>Non-pin-side damage (minor defect)</p>	<p>$c < T$ 1) b exceeds $1/3 \text{ BM}$ 【Reject】 $c = T$ b not touch the seal glue 【Accept】</p>	<p>c : Thickness b: width of damage</p> 



10.3.1.2 LCD appearance defect (View area)

No	Defect item	Criteria		Remark
		Specification	Allowable	
1	Fiber、glass cratch、polarizer scratch/folded (minor defect)	$W \leq 0.03\text{mm}$	disregard	note1: L : Length、W : Width note2: disregard if out of AA 
		$0.03\text{mm} < W \leq 0.05\text{mm}; L \leq 3.0\text{mm}$	2	
		$0.05\text{mm} < W \leq 0.1\text{mm}; L \leq 3.0\text{mm}$	1	
		$W > 0.1\text{mm}; L > 3.0\text{mm}$	0	
2	Polarizer bubble、concave and convex (minor defect)	$\psi \leq 0.2\text{mm}$	disregard	note 1: $\psi = (L+W)/2$; L : Length、W : Width note2: disregard if out of AA
		$0.2\text{mm} < \psi \leq 0.3\text{mm}$	2	
		$0.3\text{mm} < \psi \leq 0.5\text{mm}$	1	
		$0.5\text{mm} < \psi$	0	
3	Black dots、dirty dots、impurities、eyewinker (Major defect)	$\psi \leq 0.15\text{mm}$	disregard	note 1: disregard if out of AA note2: Inspection by RGB pattern 
		$0.15\text{mm} < \psi \leq 0.25\text{mm}$	2	
		$0.25\text{mm} < \psi \leq 0.3\text{mm}$	1	
		$0.3\text{mm} < \psi$	0	
4	Polarizer prick (Major defect)	$\psi \leq 0.1\text{mm}$	disregard	note1: $\psi = (L+W)/2$; L = Length、W = Width note2: the distance between two dots > 5mm
		$0.1\text{mm} < \psi \leq 0.25\text{mm}$	3	
		$\psi > 0.25\text{mm}$	0	

10.3.1.3 .FPC

No	Defect item	Criteria		Remark
		Specification	Allowable	
1	Copper screen peel (Major defect)	Copper screen peel 【Reject】		
2	No release tape or peel (Major defect)	No release tape or peel 【Reject】		
3	Dirty dot and impurity of FPC for customer using side (minor defect)	Specification	Allowable	note1: Cannot have stride ITO impurities
		$\psi \leq 0.25\text{mm}$	2	
		$\psi > 0.25$	0	



10.3.1.4 Black tape & Mara tape

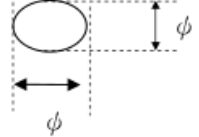
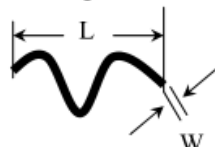
No	Defect item	Criteria	Remark
1	FPC or H/S black tape shift (minor defect)	1.shift spec: 1)glue to the polarize 【Reject】 2) IC bare 【Reject】 2. left-and-right spec: 1) exceed of FPC edge or H-S edge 【Reject】 2)IC bare 【Reject】	
2	No black tape (Major defect)	No black tape 【Reject】	
3	Tape position mistake (minor defect)	Not by engineering drawing 【Reject】	
4	Mara tape defect (minor defect)	Peel before pulling the protecting film. 【Reject】	

10.3.1.5 Silicon and Tuffy glue

No	Defect item	Criteria	Remark
1	Quantity of silicon (minor defect)	Uncover the ITO and circuit area. 【Reject】	note: compared by engineering drawing.
2	Tuffy glue (minor defect)	1. Uncover the reveal copper area 【Reject】 2. Cover layer 0.3mm(Min) ~ 3.0mm(Max) 【accept】	note:if customer has special requirement , refer to the technical document.
3	Depth of glue covering (minor defect)	Depth of glue covering overtop front Polarizer 【Reject】	Except of the special requirement .



10.3.2 Electrical criteria

No	Defect item	Criteria	Remark	
1	No display (Major defect)	No display 【 Reject 】		
2	Missing line (Major defect)	Missing line 【 Reject 】		
3	Seg-com light and dark (Major defect)	Seg-com light and dark 【 Reject 】		
4	No display in immobility (Major defect)	No display in immobility 【 Reject 】		
5	Flicker of Pattern (Major defect)	Flicker of Pattern 【 Reject 】		
6	Over current (Major defect)	Over current 【 Reject 】		
7	Voltage out of specification (Major defect)	Voltage out of specification 【 Reject 】		
8	Pattern blur ,error code (Major defect)	Pattern blur ,error code 【 Reject 】		
9	Dark light, Flicker (Major defect)	Dark light, Flicker 【 Reject 】		
10	Black/White dots 、 Dirty dots 、 eyewinker (Major defect)	Specification	Allowable disregard  Note1: disregard if out of AA note2: Inspection by RGB pattern	
		$\psi \leq 0.15\text{mm}$		2
		$0.15\text{mm} < \psi \leq 0.25\text{mm}$		1
		$0.25\text{mm} < \psi \leq 0.3\text{mm}$		0
		$0.3\text{mm} < \psi$		0
11	Fiber 、 glass crack 、 polarizer scratch/folded (minor defect)	$W \leq 0.03\text{mm}$	note1: L : Length , W : Width note2: disregard if out of AA 	
		$0.03\text{mm} < W \leq 0.05\text{mm} ; L \leq 3.0\text{mm}$		2
		$0.05\text{mm} < W \leq 0.1\text{mm} ; L \leq 3.0\text{mm}$		1
		$W > 0.1\text{mm} ; L > 3.0\text{mm}$		0



11. PRECAUTIONS FOR USE

11.1 Safety

- (1) Do not 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.

11.2 Storage Conditions

- (1) Store the panel or module in a dark place where the temperature is $23\pm 5^{\circ}\text{C}$ and the humidity is below $45\pm 20\%\text{RH}$.
- (2) Store in anti-static electricity container.
- (3) Store in clean environment, free from dust, active gas, and solvent.
- (4) Do not place the module near organics solvents or corrosive gases.
- (5) Do not crush, shake, or jolt the module.

11.3 Handling Precautions

- (1) Avoid static electricity, which can damage the CMOS LSI.
- (2) The polarizing plate of the display is very fragile. so, please handle it very carefully.
- (3) Do not give external shock.
- (4) Do not apply excessive force on the surface.
- (5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of the plate.
- (6) Do not use ketonic solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (7) Do not operate it above the absolute maximum rating.
- (8) Do not remove the panel or frame from the module.

11.4 Warranty

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