

TFT LCD Module Inspection Specification

Model No. : AT070TN94

Customer :
Approved By

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Version	Date	Page	Section	Description
1.0A	2021/06/11			New

Inspection Standards for LCD Modules

1. Description

These inspection standards shall be applied to LCD Module supplied by INNOLUX Optoelectronics Corporation. This model is only used in CE product.

2. Classification of defects

Defects are classified two types, major defect and minor defect according to the defect. And, the definition of defects is classified as below.

(1) Major defect

Any defect may result in functional failure, or reduce the usability of product for its purpose. For example, electrical failure, deformation and etc..

(2) Minor defect

A defect that is not to reduce the usability of product for its intended purpose and un-uniformity, dot defect and etc..

The criteria on major or minor judgment will be according with the classification of defects.

3. The environmental condition of inspection

The environmental condition and visual inspection shall be conducted as below.

(1) Ambient temperature : 25 ± 5 °C

(2) Humidity : 25~75 % RH

(3) Panel visual inspection on the operation condition for cosmetic shall be conducted at the distance 30~40cm or more between the LCD module and eyes of inspector.

Ambient Illumination : 800~1200 Lux for external appearance inspection

Ambient Illumination : 200~500 Lux for light on inspection

(4) The viewing angle :

a) ± 15 degree to the front surface of display panel in vertical direction.

b) ± 45 degree to the front surface of display panel in horizontal direction.

(5) Display panel shall be conducted at the distance 30~40cm between the LCD module and eyes of inspector (Fig. 1)

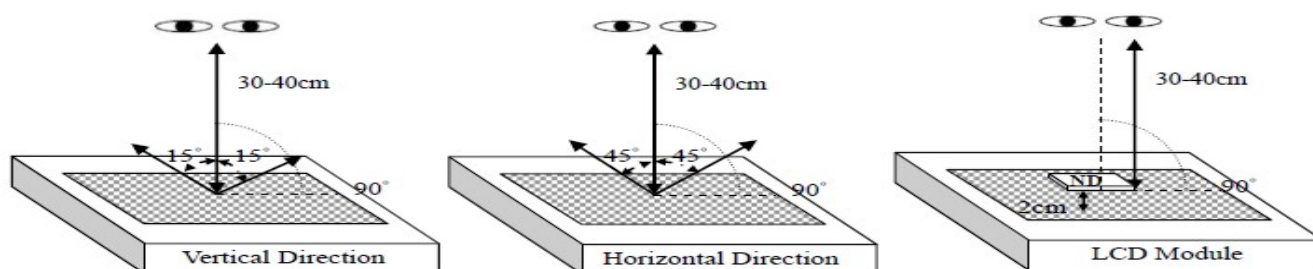


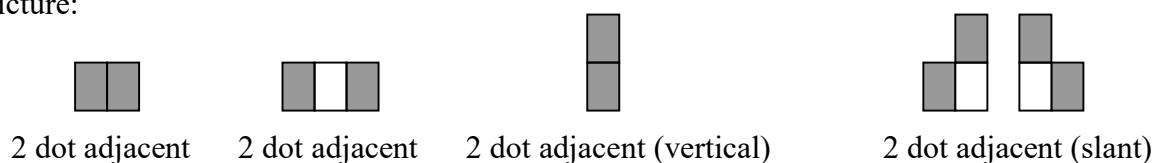
Fig. 1

4. Inspection Criteria

(1) Definition of dot defect induced from the panel inside

- a) Full Bright dot : Dots appear bright and unchanged in size in which LCD panel is displaying under black pattern.
- b) Full Dark dot : Dots appear dark and unchanged in size in which LCD panel is displaying under white, pure red, green, blue picture.
- c) 2 dot adjacent = 1 pair = 2 dots

Picture:



(2) Display Inspection Standards when Power On

Items		Acceptable count
Full Bright Dot	Random	$N \leq 3$
	2 dots adjacent	$N \leq 0$
	3 dots adjacent	$N \leq 0$
Full Dark Dot	Random	$N \leq 4$
	2 dots adjacent	$N \leq 1$
	3 dots adjacent	$N \leq 0$
Total Full Bright and Full Dark Dot		$N \leq 7$
Distance	Minimum distance between full bright / full dark dots	$\geq 5\text{mm}$
Display Failure (V-line/H-line/Cross line etc.)		Not allowable
Mura	Not visible through 5% ND filter in 50% gray or judge by limit sample if necessary	
Foreign Black/White/Bright Spot	$D \leq 0.3\text{mm}$, Ignore $0.3\text{mm} < D \leq 0.5\text{mm}$, $N \leq 4$ Distance $\geq 5\text{mm}$ It is shown in Fig. 2.	
Foreign Black/White/Bright Line	$W \leq 0.07\text{ mm}$, Ignore $0.07 < W \leq 0.1\text{ mm}$, $L \leq 5.0\text{ mm}$, $N \leq 4$ It is shown in Fig. 3.	

***Note: Defect which is on the Black Matrix(outside of Active Area) are not considered as a defect.**

- 1. W : Width
- 2. L : Length
- 3. D : Average Diameter
- 4. N : Count

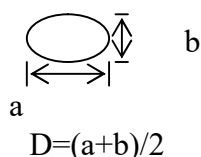


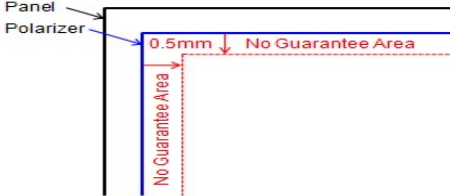
Fig. 2



W: width, L : length

Fig. 3

(3) External Appearance Inspection Criteria (Power Off)

Item	Standards	
Foreign Black/White Spot	$D \leq 0.3\text{mm}$, Ignore $0.3\text{mm} < D \leq 0.5\text{mm}$, $N \leq 4$ Distance $\geq 5\text{mm}$ It is shown in Fig. 2.	
Foreign Black/White Line	$W \leq 0.07\text{ mm}$, Ignore $0.07 < W \leq 0.1\text{ mm}$, $L \leq 5.0\text{ mm}$, $N \leq 4$ It is shown in Fig. 3	
Polarizer Dent/Bubble	$D \leq 0.3\text{mm}$, Ignore $0.3\text{mm} < D \leq 0.5\text{mm}$, $N \leq 4$ Distance $\geq 5\text{mm}$	
Polarizer Scratches	$W \leq 0.07\text{ mm}$, Ignore $0.07 < W \leq 0.1\text{ mm}$, $L \leq 5.0\text{ mm}$, $N \leq 4$	
FPC Cable	Cable not continuous 、 Break-off 、 Connector Burn-off /Break-off	
Metal Frame (Bezel)	Scratch	*Noticeable scratch and exfoliation coating are not permitted. *The oxidized metal is not permitted.
	Incomplete assembly is not permitted.	
Backlight	Scratch	The scratch which may causes a problem in practical use is not permitted.
	Break-off	Breaking off is not permitted.
	Crack	The crack is not permitted.
Tape/Label	Incorrect position, missed label is not permitted.	
Connector	Assembly NG or Function fail caused by deformation is not permitted	
Outline Size	Spec. out is not permitted.	
No Guarantee Area for Polarizer	From the edge $\leq 0.5\text{mm}$. 	
Protective Film	Any defects on the protective film are ignored, such as protective film scratches, protective film bubbles and particles on protective film.	

Notes: 1. If any specific defect is not included in the above defect table, this defect should be judged by INX/ODM/Brand customer discussion.

2. Defect was ignored if invisible at the user side.

3. Any defect can be wiped off, ignore.