

LCD Module Inspection Specification

Model No.: ALL Notebook series

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Approval By

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Revision History

Version	Date	Page	Section	Description

Inspection Standards for LCD Modules

1.Description

These inspection standards shall be applied to LCD Module supplied by CHI MEI INNOLUX Corporation.

2.The environmental condition of inspection

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

- (1) Ambient temperature : 15~25°C
- (2) Humidity: 25~75 %RH
- (3) External appearance inspection shall be conducted by using a single 20W fluorescent lamp or equivalent illumination.
- (4) Panel visual inspection on the operation condition for cosmetic shall be conducted at the distance 35cm or more between the LCD module and eyes of inspector. And, the viewing angle shall be 90 degree to the front surface of display panel.

Ambient Illumination: 400 ~ 600 Lux for external appearance inspection

Ambient Illumination: 100 ~ 200 Lux for light on inspection

- (5) Using method for ND Filter

When using ND Filter for judging Mura, placing ND Filter near Mura defect and get close to the surface of LCD Panel (its distance shall be 1~2cm between the surface of Panel and ND Filter). Don't touch the surface of polarizer to avoid scratching polarizer, and then move to the defect position to judge mura by view angle 90 degree within 3 seconds (The viewing angle shall be 90 degree to the right top of Mura defect with panel).

3.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..

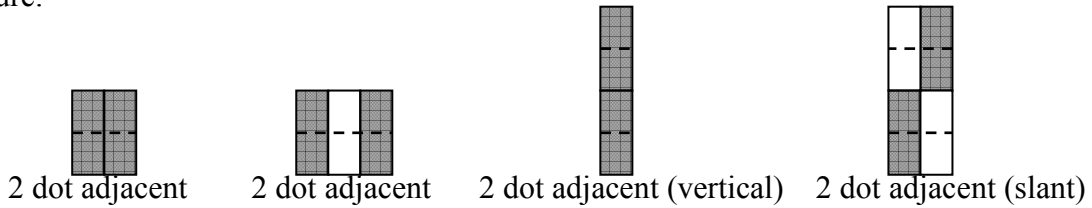
The criteria on major and/or minor judgment will be according with the classification of defects.

4.Inspection Criteria

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

- a) The definition of dot: The size of a defective dot over 1/2 of whole dot is regarded as one defective dot.
- b) Bright dot: Dots appear bright and unchanged in size in which module is displaying under black pattern.
- c) Dark dot: Dots appear dark and unchanged in size in which module is displaying under pure red, green, blue picture.
- d) 2 dot adjacent = 1 pair = 2 dots

Picture:

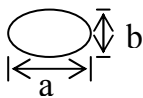


(2) Display Inspection

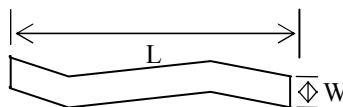
Items		Acceptable count
Bright dot	Random	$N \leq 6$
	2 dots adjacent	$N \leq 3$
	3 dots adjacent or more	$N \leq 2$
Dark dot	Random	$N \leq 7$
	2 dots adjacent	$N \leq 3$
	3 dots adjacent or more	$N \leq 2$
Distance	Minimum Distance Between Bright dots	Ignore
	Minimum Distance Between Dark dots	Ignore
Total bright and dark dot		$N \leq 8$
Foreign Black/White/Bright Spot		$0.15 < D \leq 1.0\text{mm}$, $N \leq 4$
Foreign Black/White/Bright Lint		$0.05 < W \leq 0.7\text{mm}$, $0.5 < L \leq 5.0\text{mm}$, $N \leq 6$
Display failure (V-line/H-line/Cross line etc.)		Not allowable
Mura	3% ND filter in 50% Gray pattern	

5.External Appearance Inspection Criteria

Item	Contents	
Screw	Parts mounting, incomplete assembly, deformation, oxidized, crooked is not permitted.	
Light Bar	FFC Break-off 、Connector Break-off / Burn-off is not permitted	
Metal frame (Bezel)	Assembly NG or Function fail caused by deformation 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.
Stain on Polarizer	The stain which can't be wiped off 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.	
Polarizer Scratches	$0.05 < W \leq 0.7\text{mm}$, $0.5 < L \leq 10.0\text{mm}$, $N \leq 6$	
Dent/Air Bubble	$0.15 < D \leq 1.0\text{mm}$, $N \leq 6$	



$$D = (a+b)/2$$



W: width, L : length

6. Classification of defects

Inspection Item	Criteria and Description	Defect type
Vertical line	Signal input, vertical line off or irregular V-line appears	major
Horizontal line	Signal input, horizontal line off or irregular H-line appears	major
Cross line	Pattern signal input, a correct display is not obtained	major
No display	Signal input, display is dead	major
Irregular display	Pattern signal input, a correct display is not obtained	major
Dots defect	Exceed specified standards	minor
Scratch and Dent on polarizer	Exceed specified standards	minor
Foreign material	Exceed specified standards	minor
External Appearance	Deformation, irregular plating, coating missing etc. A appearance defect that do not affect function or performance	minor
Bezel claw	Bezel claw missing or not bent	major
Polarizer bubble	Exceed specified standards	minor