INNOLUX CORPORATION

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TFT LCD Module Inspection Specification

Model No.: S546 ~ S650 (PID QFHD Module)

Customer :
Approved by 

Approved by


Revision History

Address : No.160, Kesyue Rd., Jhunan Science Park, Miaoli County 35053, Taiwan (R.O.C.)
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Version	Date	Page	Section	Description

Inspection Standards for LCD Modules

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1.Description

These inspection standards shall be applied to LCD Module supplied by InnoLux Corporation.

This model is only used in ordinary PID(Public Information Display) product, if it is used in other product applications, it still adopts this copy of specification.

If there are any other product applications such as touch function, handwriting recognition, Industrial use, Medical use, Aerospace usage and so on, the specifications should be negotiated separately.

IIS shall prevail over Product Specifications, QDS(Quality description sheet) or other relative documents.

2.The environmental condition of inspection

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

(1) Ambient temperature : 20~30℃

(2) Humidity: 25~75 %RH

(3) The visual inspection distance: The visual inspection distance of panel between LCD module and inspector's sight should be at 100cm distance or more.

(4) The viewing angle:

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

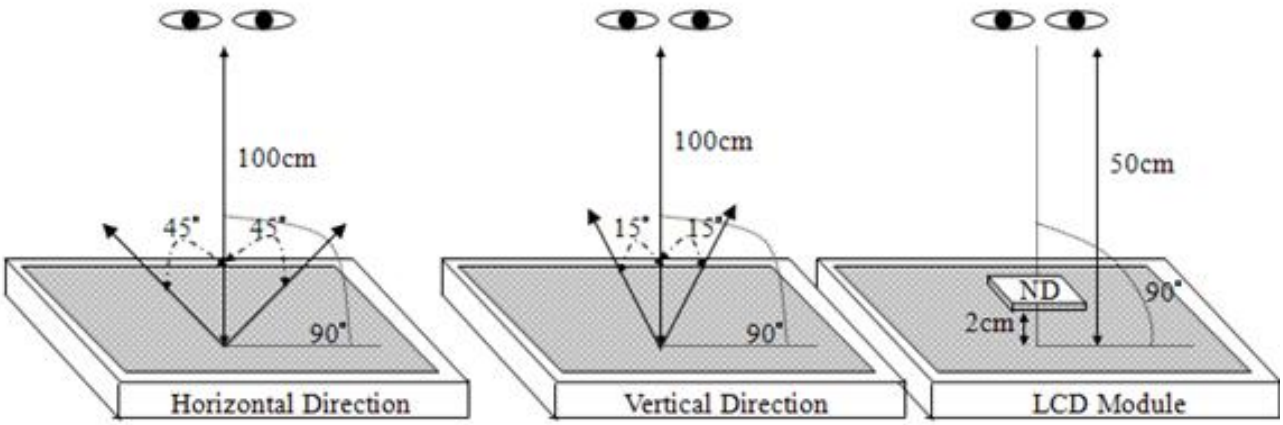
b) ±45 degree to the front surface of display panel in horizontal direction.

(5) Ambient Illumination:

a) External appearance inspection: 400 ~ 600 Lux

b) Light on inspection: 100~200 Lux

(6) ND filter shall be conducted at the distance 2 cm to front surface of display panel and shall be conducted at the distance 50 cm between the LCD module and eyes of inspector.



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3.Classification of defects

The defects are classified as major and minor defects. The definitions of defects are described as below.

(1) Major defect

The defect may cause the functional failure, or reduce the usability of the product for its purpose.

For example: electrical failure, deformation etc.

(2) Minor defect

The defect doesn't reduce the usability of product for its purpose.

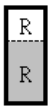
For example: dot defect, mura etc.

※ The judgment of the major and minor defects shall be according to Item 5. (Classification table of defects)

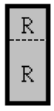
4.Inspection Criteria

4.1 The Definition of the Dot Defect:

If the size of dot defect is larger than 1/2 single dot, it can be regarded as one dot defect.



1 dot defect



1 dot defect



1 dot defect

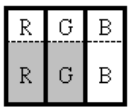


1 dot defect

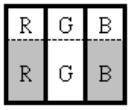
(1) Bright dot: Dot appears brightness and the size is fixed in black pattern.
(It excludes the particle issue and CF defect.)

(2) Dark dot: Dot appears darkness and the size is fixed in pure red, green, blue pattern.
(It excludes the particle issue.)

(3) 2 dot adjacent = 1pair = 2 dots, the phenomenon is shown as below:



2 dot adjacent



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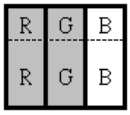
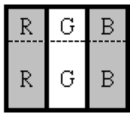


2 dot adjacent



2 dot adjacent

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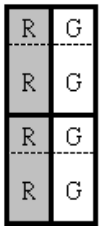
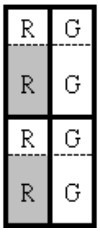
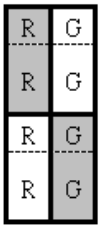


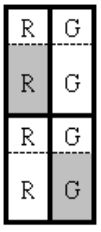
2 dot adjacent (Vertical)



2 dot adjacent (Vertical)

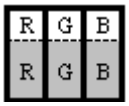


2 dot adjacent (Slant)

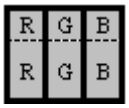


2 dot adjacent (Slant)

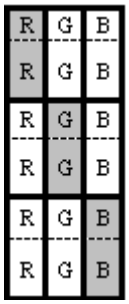
(4) 3 dot adjacent = 1 set = 3 dots, the phenomenon is shown as below:



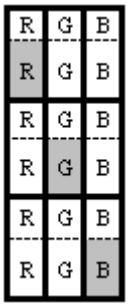
3 dot adjacent



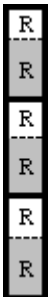
3 dot adjacent



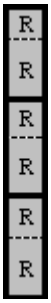
3 dot adjacent (Slant)



3 dot adjacent (Slant)



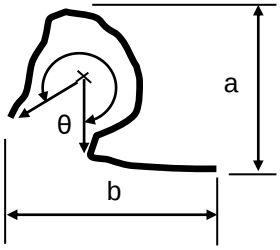
3 dot adjacent (Vertical)



3 dot adjacent (Vertical)

4.2 The definition of the obvious spot and obvious lint defect:

(1) Spot defect: If θ>180∘ , and the defect was bigger than half of circle, it will be judged as the spot shape.



Definition of average diameter (D) is (a+b)/2.

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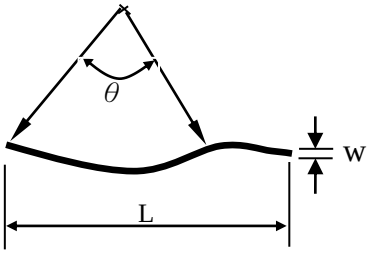
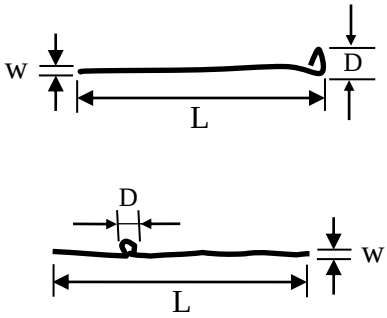
(2) Lint defect:

a) If θ≦180∘ , and the defect was smaller or equal to half of circle, use the specification of wide (W) and length (L) for judgment.



b) If the average diameter (D) of curly defect was less than minimum criteria of wide which judge as lint defect, use the specification of wide (W) and length (L) for judgment even though the θ>180∘ .



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4.3 Display Defect

Item		Standard
Bright dot	Random	N≦5
	2 dots adjacent	N≦2
	3 dots adjacent or more	N＝0
	Minimum Distance Between Bright dots	L≧5mm
Dark dot	Random	N≦18
	2 dots adjacent	N≦8
	3 dots adjacent	N≦5
	4 dots adjacent or more	N＝0
	Minimum Distance Between Dark dots	L≧5 mm
Total bright and dark dot		N≦18
Black Spot/White Spot/Bright Spot		0.8＜D≦1.2 mm, N≦18 D≦0.8mm, Neglect
Black Lint/White Lint/Bright Lint		0.15＜W≦0.25mm, 0.3＜L≦12.0mm, N≦12 W≦0.15mm & L≦0.3mm, Neglect
Mura		Judged by 2% ND Filter in 50% gray pattern. (If both customer and INX agree mutually, INX will set up limit sample and apply to the criteria with the customer.)
Functional failure (V-line/H-line/Cross line etc.)		Not allowable

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4.4 Appearance Defect

Item	Standard	
Screw	Missed, incomplete, or deformed assembly is not permitted.	
Cable	Broken cable, burned connector is not permitted.	
Metal frame (Bezel)	Incomplete assembly is not permitted.	
Backlight	Break down	No display of backlight unit is not permitted.
	Crack	The crack is not permitted.
Tape/Label	Incorrect position, missed label is not permitted.	
Connector	Oxidized/rusty connector is not permitted.	
Outline size	Out of spec. is not permitted.	
Stain on Polarizer	The stain, which can't be wiped off, is not permitted.	
Polarizer Scratches	$0.15 < W \leqq 0.25$mm, $0.3 < L \leqq 12.0$mm, $N \leqq 12$ $W \leqq 0.15$mm & $L \leqq 0.3$mm, Neglect	
Dent/Air Bubble	$0.8 < D \leqq 1.2$mm, $N \leqq 18$ $D \leqq 0.8$mm, Neglect	

Notes:

1. W: Width
2. L: Length
3. D: Average Diameter
4. N: Count
5. Both companies should have a further discussion, if the issue is controversial.
6. Items not listed above should meet Product spec..

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5.Classification Table of defects

Inspection Item	Description	Defect type
Vertical line	Abnormal line appears in vertical direction	Major
Horizontal line	Abnormal line appears in horizontal direction	Major
Cross line	Abnormal cross line appears in display	Major
No display	No signal outputs in display	Major
Irregular display	Abnormal signal outputs in display	Major
Dots defect	Bright dot ,dark Dot or dot adjacent appear in display	Minor
Scratch and Dent on polarizer	Polarizer is damaged on the surface.	Minor
Mura	Uniformity is appeared in display	Minor
Polarizer bubble	Polarizer bubble appears in display	Minor
Spot/ Lint	Black/White /Bright Spot & Lint in display	Minor

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