

TITLE : VISUAL INSPECTION CRITERIA

- 32" Module

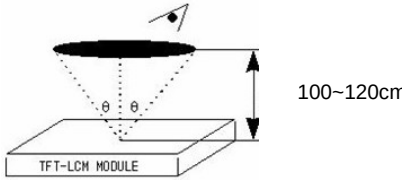
BEIJING BOE DISPLAY TECHNOLOGY

SPEC. NUMBER
S45-8421PRODUCT GROUP
TFT-LCD PRODUCTREV.
OISSUE DATE
2016.8.30PAGE
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B2010-8002-O (1/3)

A4(210 X 297)

 京东方 BOE		PRODUCT GROUP TFT-LCD PRODUCT		REV. O	ISSUE DATE 2016.8.30
REVISION HISTORY					
REV	ECN NO.	DISCRIPTION OF CHANGES		DATE	PREPARED
O	-	INITIAL RELEASE		2014/6/7	WangKai
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	TFT-LCD PRODUCT		O	2016.8.30
1.0 Introduction				
1.1 Scope				
This Incoming Inspection Standard shall be applied to TFT-LCD Modules(hereafter call the "LCMs") supplied by BOE(hereafter called the "Supplier") to its Customer.				
1.2 Incoming Inspection Right				
The Customer shall have the right to conduct at its own cost and expense,an incoming inspection of the LCMs at the destination specified in the relevant B/L(Bills of Lading) in accordance with the LCM's specifications separately agreed upon and the inspection criteria set forth in this article.				
The customer shall notify the Supplier in writing of the inspection results(acceptance or rejectance) in accordance with the said Incoming Inspection Standard within 40 days from the date of the B/L.				
Should the Customer fail to notify the results to Supplier with 40 days period, the right to reject the LCMs shall then lapse and the said LCMs shall be deemed to have been accepted by the Customer.				
1.3 Handling Precautions				
- LCM Devices are made of fragile material such as Glass and plastic and may be broken or cracked if dropped it. So PLEASE handle them with care. - DO NOT press the area covered with PET or such materials.These are weak point of LCMs since of TCPs(Drive Ics) and PWBs. - PLEASE DO NOT touch the surface of the Glass(Polarizer). - PLEASE wear the Wrist Strap when handling. Semiconductive devices are included in the LCMs and they should be handled with care to prevent any electrostatic discharge(ESD). - PLEASE keep the LCMs in the specified,original packing boxes when storage. - DO NOT stack the LCMs too high without wrapping material such as AIR CAP. - Before use the LCMs,PLEASE check the Engineering specification. - LCMs contain a small amount of Liquid Crystal and Mercury.PLEASE follow local ordinances or regulations for disposal.				
2.0 Generals				
2.1 Inspection Environment				
2.1.1 Ambient conditions				
a. Ambient Temperature : 25±5℃ b. Relative Humidity : 50 ± 10%RH c. Ambient Illumination : External appearance inspection 500±100 Lux Light on inspection 150±50 Lux				
2.1.2 Viewing Distance				
The distance between the LCM and the inspector's eyes shall be 100~120cm				
2.1.3 Viewing Angle				
performing in front of the panel [Vertical] : ± 15 degree [Horizontal] : ± 45 degree				
2.1.4 Inspection Area				
Display Area (Active Area)				
				
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2.2 Definitions 2.2.1 Dark / Bright Spots Points on display which appear dark/bright and usually result from the contamination. These defects do not vary in size or intensity (contrast) when contrast is varied. 2.2.2 Dark / Bright Lines Lines on display which appear dark/bright and usually result from the contamination. 2.2.3 Polarizer Scratch Lines on display which are seen across a darker background and do not vary in size. 2.2.4 Polarizer Dent White spots on display which appear against a darker background and do not vary in size 2.2.5 Bright Dot Defects Dots(sub-pixels) on display which appear bright in the display area and visible through the 2%ND filter at Black Pattern and L64 gray scale pattern. 2.2.6 Dark Dot Defects Dots(sub-pixels) on display which appear dark in the display area at R,G,B Color Pattern. 2.2.7 Line Defects All line defects on display which appear bright/dark such as vertical, horizontal, or cross lines. 2.2.8 Mura Mura on display which appears darker / brighter against background brightness on parts of display area. 2.2.9 BM Defects Bright(white) Points on display which are off BM(Black Matrix). 2.2.10 Visual Inspection Inspection for LCM when the unit turns on. 2.2.11 Appearance Inspection External inspection for LCM when the unit turns off. 2.2.12 Others Defects which cannot be classified into the above defect definitions.														
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3.0 Inspection Criteria

3.1 Visual Inspection Criteria

ITEMS	DETAILS		INSPECTION CRITERIA (L: mm)
Sub Pixel Defects	Bright Sub Pixel Defect		N ≤ 0
	Dark Sub Pixel Defect		N ≤ 7
	Bright+Dark Sub Pixel Defect		N ≤ 7
	Defect Distance	Bright & Bright	
		Dark & Dark	L ≥ 5mm
	2 Adjacent Bright Sub Pixel Defect		N ≤ 0
	2 Adjacent Dark Sub Pixel Defect		N ≤ 2
	3 Adjacent Bright Sub Pixel Defect		N ≤ 0
	3 Adjacent Dark Sub Pixel Defect		N ≤ 1
Partial Dot ≤ 1/2 Dot		N ≤ 10	
Line Defects	Bright Line, Dark Line		N = 0
Displayed Screen	Black/Bright Spot (Hair, Lint, Etc)	Circular Type	D ≤ 0.3 Ignore 0.3< D ≤ 1.0, N ≤ 5
		Linear Type	W ≤ 0.05 Ignore 0.05< W ≤ 0.25, 0.5 < L ≤ 5.0, N ≤ 5
	Polarizer Dent/Bubble Scratch	Circular Type	D ≤ 0.3 Ignore 0.3< D ≤ 1.0, N ≤ 5
		Linear Type	W ≤ 0.05 Ignore 0.05< W ≤ 0.25, 0.5 < L ≤ 5.0, N ≤ 5
	Glass Broken, Stain		Could not be seen by human eyes
	Circular White Mura, Lumination Mura, Black/White Mura, etc.		Judged by 2% ND Filter in 50% gray pattern. (If both customer and BOE agree mutually, BOE will set up limit sample and apply to the criteria with the customer.)
Crosstalk			Should not be perceived

Note 1) D = Diameter, L = Length, W = Width, N = Number

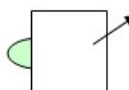
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Note 3) Dot which is invisible through 2% ND filter in 50% gray pattern or smaller than 1/2 of sub-pixel size will not counted as " 1 dot " Defect.

[Invisible]

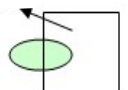
2% ND Filter

[Visible]



"No dot defect"

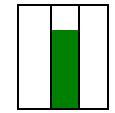
(=ignored/not counted)



"1 dot defect"

(=counted)

[Larger than 1/2]

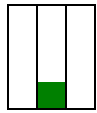


R G B

" 1 dot defect"

(=counted)

[Smaller than 1/2]

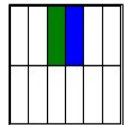


R G B

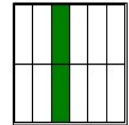
"partial dot defect"

(N ≤12)

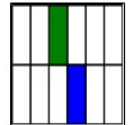
[2 adjacent dots defect]



Type 1



Type 2



Type 3

3.2 Appearance Inspection Criteria

ITEM	DETAILS		INSPECTION CRITERIA
Bezel	Scratch,Dent, Contamination	Front	Circular Type 0.5< D ≤ 1.0, N ≤ 2
			Linear Type 0.01< W ≤ 0.1, 0.3 < L ≤ 12.0, N ≤ 2
		Side	Ignore
	Assembly		Should be assembled correctly with panel
	Bending Area		Should be in mechanical spec.
Plastic	Color Change, Bent		Ignore
	Break, Modification		Not allowed
	Scratch, Contamination		Could not be seen by human eyes
	Burr		0.3<L≤30.0, One Side N≤1, Total N≤3
Cable	Scratch		Could not be seen by human eyes
	Cable Position, Connecting Method		should be in correct position
Signal / Power Input Connector	Break		Not allowed
Connector Others	Looseness		Not allowed
Screw	Improperness, Loosenss		Not allowed
Lable	No Lable, Reversed Lable Attach, Long Distance Attach		Not allowed
	Split, Contamination, Vagueness		At least, it should be legible character by character

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4.0 RMAs				
4.1 Verification				
The supplier can verify the defective LCMs to segregate the responsibilities at customer's facility or can request the Customer to ship the defective LCMs to assigned place for verification This verification result shall be agreed mutually by the Customer and Supplier. This result can be corrected or changed after detail failure analysis at Supplier's facilities.				
4.2 Supplier Induced Defects				
All of the Supplier induced defective LCMs shall be returned to the Supplier for repair or replacement. Before return the defective LCMs, the Customer needs Supplier's confirmation with RMA Number. All of the returned LCMs shall be returned to the Customer within agreed time period.				
4.3 Customer Induced Defects				
The Customer can return the customer induced defective LCMs to the Supplier for repair. The repair cost for Customer induced defective LCMs shall be agreed with both parties, Customer and Supplier				
4.4 RMA LCMs' shipment				
4.4.1 For the Chinese Customers				
BOE RMA LCMs would be returned to BOE BEIJING factory				
4.4.2 For the Korea Customers				
BOE RMA LCMs would be returned to Korea.				
4.4.3 For the other countries' Customers				
If there is a repair center in the Customer's country, BOE RMA LCMs shall be returned to the repair center. If there is no repair center in the Customer's country, BOE RMA LCMs shall be returned to BEIJING				
5.0 Others				
If any problems arise with the LCMs supplied by supplier, the customer and supplier will cooperate and make efforts to solve it with mutual confidence and respect.				
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