

TITLE : VISUAL INSPECTION CRITERIA FOR ALL CUSTOMER

- MNT NORMAL MODULE A-Grade

BEIJING BOE DISPLAY THCHNOLOGY

SPEC. NUMBER
S45-8007PRODUCT GROUP
TEST-MODULEREV.
OISSUE DATE
2017.09.06PAGE
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REVISION HISTORY

REV	ECN NO.	DISCRIPTION OF CHANGES		DATE	PREPARED
O	-	INITIAL RELEASE		2017/9/6	He Runhan
SPEC. NUMBER S45-8007		SPEC. TITLE	VISUAL INSPECTION CRITERIA FOR CUSTOMER (Normal MODULE A-Grade)		PAGE 2 OF 9
B2010-8002-O(2/3)					A4(210 X 297)

 京东方 BOE	PRODUCT GROUP		REV.	ISSUE DATE
	TEST-MODULE		O	2017.09.06
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 support the Bezel with your finger when connecting the interface cable.				
-. 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 Sampling Method

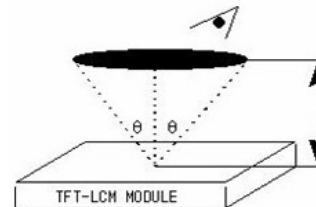
Unless otherwise agreed upon in writing the sampling inspection shall be applied to the Customers' incoming inspection

- 2.1.1 Lot size : 1 pallet per same model
- 2.1.2 Sampling type : Random sampling
- 2.1.3 Inspection level : II
- 2.1.4 Sampling table : MIL-STD - 105E

2.2 Inspection Environment

2.2.1 Ambient conditions

- a. Ambient Temperature : 25 ± 3 °C
- b. Relative Humidity : $65 \pm 20\%$ RH
- c. Ambient Illumination : 300~700 LUX (Normal : 500LUX)



70CM-100CM

2.2.2 Viewing Distance

The distance between the LCM and the inspector's eyes shall be at least 70CM~100CM

2.2.3 Viewing Angle

performing in front of the panel

- [Vertical] : ± 25 degree
- [Horizontal] : ± 40 degree

2.2.4 Inspection Area

Display Area (Active Area)

2.3 Definitions

2.3.1 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.

2.3.2 Dark / Bright Lines

Lines on display which appear dark/bright and usually result from the contamination.

2.3.3 Polarizer Scratch

Lines on display which are seen across a darker background and do not vary in size.

2.3.4 Polarizer Dent

White spots on display which appear against a darker background and do not vary in size

2.3.5 Bright Dot Defects

Dots(sub-pixels) on display which appear bright in the display area and visible through the 5%ND filter at Black Pattern and L64 gray scale pattern.

2.3.6 Dark Dot Defects

Dots(sub-pixels) on display which appear dark in the display area at R,G,B Color Pattern.

2.3.7 Line Defects

All line defects on display which appear bright/dark such as vertical, horizontal, or cross lines.

2.3.8 Mura

Mura on display which appears darker / brighter against background brightness on parts of display area.

2.3.9 BM Defects

Bright(white) Points on display which are off BM(Black Matrix).

2.3.10 Visual Inspection

Inspection for LCM when the unit turns on.

2.3.11 Appearance Inspection

External inspection for LCM when the unit turns off.

2.3.12 Others

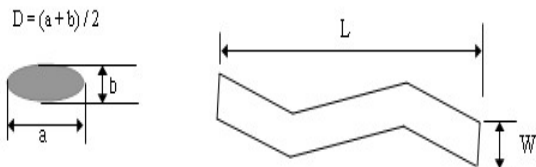
Defects which cannot be classified into the above defect definitions.

3.0 Inspection Criteria

3.1 Visual Inspection Criteria

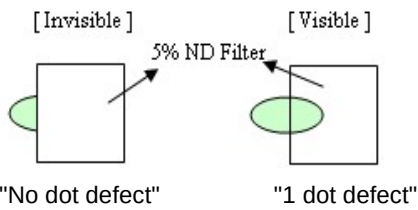
ITEMS	DETAILS		INSPECTION CRITERIA
Sub Pixel Defects	Bright Sub Pixel Defect		$N \leq 0$
	Dark Sub Pixel Defect		$N \leq 5$
	Bright+Dark Sub Pixel Defect		$N \leq 5$
	Defect Distance	Bright & Bright	-
		Dark & Dark	$L \geq 5\text{mm}$
	2 Adjacent Bright Sub Pixel Defect		$N \leq 0$
	2 Adjacent Dark Sub Pixel Defect		$N \leq 2$
	3 Adjacent Bright Sub Pixel Defect		$N = 0$
Line Defects	Bright Line, Dark Line		$N = 0$
Displayed Screen	Black/Bright Spot (Hair, Lint, Etc)	Circular Type	$D \leq 0.2$ Ignore $0.2 < D \leq 1.0, N \leq 5$
		Linear Type	$W \leq 0.05$ Ignore $0.03 < W \leq 0.25, 0.5 < L \leq 5.0, N \leq 5$
	Polarizer Dent/Bubble Scratch	Circular Type	$D \leq 0.2$ Ignore $0.2 < D \leq 1.0, N \leq 5$
		Linear Type	$W \leq 0.05$ Ignore $0.03 < W \leq 0.25, 0.5 < L \leq 5.0, N \leq 5$
	Glass Broken, Stain		Could not be seen by human eyes
	Circular White Mura, Lumination Mura, Black/White Mura, etc.		Refer to Limit Sample or 5% ND Filter in 50% of total gray pattern
Flicker			Adjust flicker to the best effect at the center area
Crosstalk			Should not be perceived

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



Note 2) Circular Type : long axis/short axis ≤ 2
Linear Type : long axis/short axis > 2

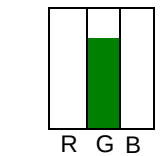
Note 3) Dot which is invisible through 5% ND filter or smaller than 1/2 of sub-pixel size will not counted as " 1 dot " Defect.



(=ignored/not counted)

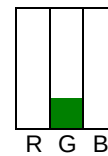
(=counted)

[Larger than 1/2] [Smaller than 1/2]



" 1 dot defect"

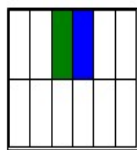
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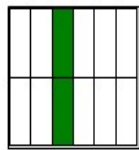
"partial dot defect"

(N ≤ 8)

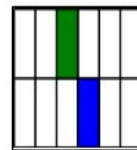
[2 adjacent dots defect]



Type 1



Type 2



Type 3

ITEM	DETAILS	INSPECTION CRITERIA
Bezel	Scratch, Contamination	Could not be seen by human eyes
	Assembly	Should be assembled correctly with panel
	Bending Area	Should be in mechanical spec.
	Color Change, Bent	Nothing
Plastic	Break, Modification	Not allowed
	Scratch, Contamination	Could not be seen by human eyes
	Burr	Not allowed
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

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 BEIJING

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 Warranty

5.1 Warranty Period

In-warranty period is Eighteen(18) Months from manufacturing month of LCM.

Note)

a. Eighteen months are composed of twelfth months in-warranty period and sixth months distribution period.

b. The manufacturing Month is on the LCMs as Supplier's serial No.

5.2 Repair Warranty

Repair warranty is Twelve(12) Months from repaired month for repaired LCMs.

Note)

a. The Label for repair will be added after repairing.

5.3 Warranty avoidance

The warranty will be avoided in cases of below:

a. When the warranty period is expired.

b. The Customer induced defective LCMs.

c. When the LCMs were repaired by 3rd party without Supplier's approval.

d. When the LCMs were treated like Disassemble and Rework by the Customer and/or Customer's representatives without Supplier's approval.

6.0 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.