INCOMING INSPECTION STANDARD

2AAD672003T(T0202)

MODEL NO. : TM037YVGP01-00

ISSUED DATE: 2023.12.15

VERSION : 1.0

Customer :

Approved by	Notes
設計驗證 工程課 2024-05-03 發行	

Tianma Confirmed :

Prepared by	Checked by	Approved by
Shuqin_Ai	Zhijie_Song	Zhijie_Song

This technical specification is subjected to change without notice

1. Scope:

The incoming inspection standards shall be applied to TFT-LCD Modules (hereinafter called "Modules") that supplied by TIANMA.

2. Incoming Inspection

The customer shall inspect the modules within twenty calendar days of the delivery date（the “inspection period）at its own cost. The result of the inspection（acceptance or rejection） shall be recorded in writing, and a copy of this writing will be promptly sent to the seller, If the results of the inspecting from buyer does not send to the seller within twenty calendar days of the delivery date. The modules shall be regards as acceptance.

3. Inspection Sampling Method

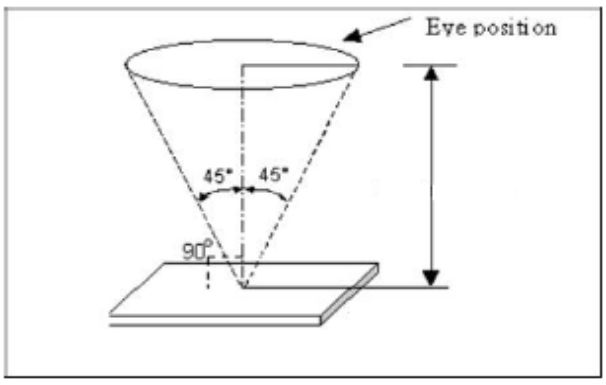
3.1. Lot size: Quantity per shipment lot per model
3.2. Sampling type: Normal inspection, Single sampling
3.3. Inspection level: II
3.4. Sampling table:GB/T 2828.1, test level Ⅱ
3.5. Acceptable quality level(AQL)
Major defect: AQL=0.65
Minor defect: AQL=1.00

4. Inspection Conditions

4.1 Ambient conditions:
a. Temperature: Room temperature 25±5℃
b. Humidity: (60±10)％RH
c. Illumination: Appearance 700±100 Lux, Display 100±50 Lux (The luminance at an inspection desk surface with single non-directive fluorescent lamp).

4.2 Viewing distance
The distance between the LCD and the inspector’s eyes shall be at least 30±5 ㎝.

4.3 Viewing Angle
U/D: 45º/45º, L/R: 45º/45º



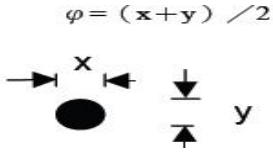
5. Inspection Criteria

Defects are classified as major defects and minor defects according to the degree of defectiveness defined herein.

5.1 Major defect

Item No	Items to be inspected Inspection Standard		Inspection Standard
5.1.1	All functional defects	1) No display 2) Display abnormally 3) Short circuit 4) line defect	Not allowed
5.1.2	Missing	Missing function component	Not allowed
5.1.3	Crack	Glass Crack	Not allowed

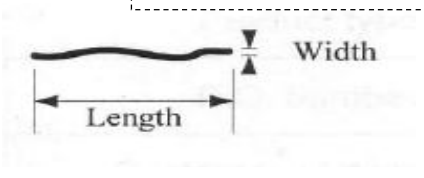
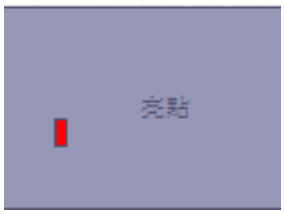
5.2 Minor defect

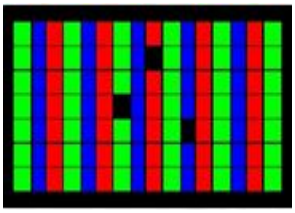
<table>
<tr><th>Item No</th><th>Items to be inspected</th><th colspan="2">Inspection standard</th></tr>
<tr><td rowspan="5">5.2.1</td><td rowspan="5">Spot Defect
Including Black spot
White spot
Foreign particle
Polarizer dirt
Assemby dirt
pinhole</td><td colspan="2">Spot definition:
φ＝（x+y）／2
</td></tr>
<tr><td>Size φ(mm)</td><td>Acceptable Quantity</td></tr>
<tr><td>φ ≤ 0.1</td><td>Ignore</td></tr>
<tr><td>0.1 < φ≤0.2</td><td>3</td></tr>
<tr><td>0.2 < φ</td><td>Not allowed</td></tr>
<tr><td rowspan="4">5.2.2</td><td rowspan="4">Polarizer Bubble/Dent</td><td>Size φ(mm)</td><td>Acceptable Quantity</td></tr>
<tr><td>φ ≤ 0.15</td><td>Ignore</td></tr>
<tr><td>0.15 < φ≤ 0.3</td><td>3</td></tr>
<tr><td>0.3 < φ</td><td>Not allowed</td></tr>
</table>

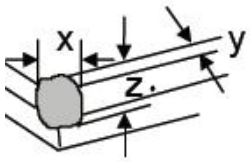
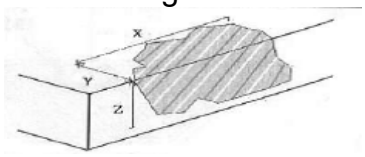
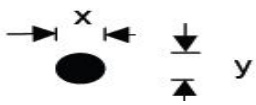
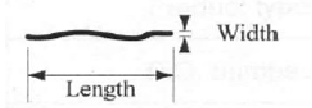
<table>
<tr><td rowspan="5">5.2.3</td><td rowspan="5">Line Defect
Including
Black line

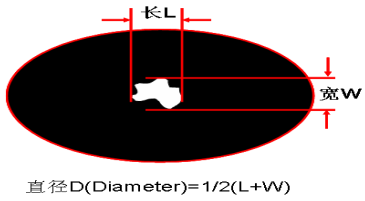
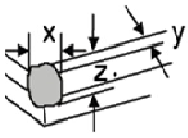
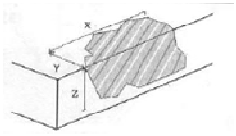
White line

Scratch

BL dirt</td><td colspan="2">Define: Length ----L Width----W

</td></tr>
<tr><td>Width(mm) Length(mm)</td><td>Acceptable Quantity</td></tr>
<tr><td>W ≤ 0.03</td><td>Ignored</td></tr>
<tr><td>0.03 < W ≤ 0.05
L≤5.0</td><td>3</td></tr>
<tr><td>0.05<W,L>5.0</td><td>Not allowed</td></tr>
<tr><td rowspan="5">5.2.4</td><td rowspan="5">Electrical Dot
Defect</td><td colspan="2">Bright and Black dot define:


and
</td></tr>
<tr><td>Item</td><td>Acceptable Quantity</td></tr>
<tr><td>Black dot defect</td><td>3</td></tr>
<tr><td>Bright dot defect</td><td>0</td></tr>
<tr><td>Total Dot</td><td>3</td></tr>
<tr><td rowspan="2">5.2.5</td><td rowspan="2">Dense tiny
bright dot</td><td colspan="2">Definition of tiny bright dot:Φ＜1/2dot</td></tr>
<tr><td colspan="2">Not accepted under 5% ND filter</td></tr>
<tr><td>5.2.6</td><td>Mura
(light leakage
inclued)</td><td colspan="2">With or without reliability sample ,not accepted under 2% ND filter, but a limits sample will be allowed</td></tr>
<tr><td rowspan="3">5.2.7</td><td rowspan="3">FPC</td><td>Broken,edge defect</td><td>Not allowed</td></tr>
<tr><td rowspan="2">FPC kink、indentation、dent</td><td>naked wire、hole is not allowed</td></tr>
<tr><td>Bend to acute angle is not allowed</td></tr>
</table>

<table>
<tr><td rowspan="5">5.2.8</td><td rowspan="5">Glass defect</td><td colspan="2">1.Corner Fragment:
</td></tr>
<tr><td>Size(mm)</td><td>Acceptable Quantity</td></tr>
<tr><td>X≤1.5 mm
Y≤0.8mm
Z≤T</td><td>Ignore
T: Glass thickness
X: Length
Y: Width
Z: thickness</td></tr>
<tr><td colspan="2">2. Side Fragment:
</td></tr>
<tr><td>X≤5 mm
Y≤0.8mm
Z≤T</td><td>Ignore
T: Glass thickness
X: Length
Y: Width
Z: thickness</td></tr>
<tr><td rowspan="5">5.2.9</td><td rowspan="5">TP spot
Including white dot
Black dot
Assemble dirt
Foreign particle</td><td colspan="2">Define :
$\varphi=(x+y)/2$
</td></tr>
<tr><td>Size D (mm)</td><td>Acceptable Quantity</td></tr>
<tr><td>φ ≤ 0.15</td><td>Ignore</td></tr>
<tr><td>0.15 < φ≤0.3</td><td>3</td></tr>
<tr><td>φ>0.3</td><td>Not allowed</td></tr>
<tr><td rowspan="4">5.2.10</td><td rowspan="4">TP:
Line defect
Including white line, Black line
Scratch</td><td colspan="2">Define:
</td></tr>
<tr><td>Size w(mm)</td><td>Acceptable Quantity</td></tr>
<tr><td>W≤0.05</td><td>ignore</td></tr>
</table>

	Assemble dirt	0.05<W≤0.10 L≤5.0	3
		0.10<W , L＞5.0	Not allowed
5.2.11	TP: Pin hole Including leakage printing dirt	Define : 	
		Size D(mm)	Acceptable Quantity
		D≤0.10	ignore
		0.10<D≤0.15	2
		D>0.15	Not allowed
5.2.12	TP: Dent / convex	Size D(mm)	Acceptable Quantity
		D≤0.15	Ignore
		0.15<D≤0.3	3
		D＞0.3	Not allowed
5.2.13	TP: Ink jag	Size w (mm)	Acceptable Quantity
		Window area W≤0.20	Ignore
		Edge area W≤0.30	Ignore
5.2.14	TP surface fragment	Corner Fragment:  Side Fragment: 	
		Size w (mm)	Acceptable Quantity
		X≤0.20 Y≤0.20 Z≤T /5	2/per side
5.2.15	Assemble bubble	Size w (mm)S	Acceptable Quantity
		D≤0.1	ignore
5.2.16	LED hole/camera eye/IR/ICON printing ink dot	Size w(mm)	Acceptable Quantity
		D≤0.1	ignore

		D＞0.1	Not allowed
5.2.17	Printing ink color	The printing ink color should be consistent with design drawing (or customer standard sample)	

Note:
1. Dot defect is defined as the defective area of the dot area is larger than 50% of the dot area.
2. Inspection area about polarizer bubble includes active display area and outside 1mm. The defect of polarizer bubble shall be ignored if it appears on other area.
3. ND application method: the parallel vertical distance between ND and panel is 3~5cm，the distance of eyes look squarely to the panel is 30±5cm
4. Foreign particle on the protective film of the LCM should be ignored.

6. Precaution

Please pay attention to the following items when you use the LCD Modules:

6-1 Do not twist or bend the module and prevent the unsuitable external force for display module during assembly.
6-2 Adopt measures for good heat radiation. Be sure to use the module with in the specified temperature.
6-3 Avoid dust or oil mist during assembly.
6-4 Following the correct power sequence while operating. Do not apply the invalid signal, otherwise, it will cause improper shut down and damage the module.
6-5 Less EMI: it will be more safety and less noise.
6-6 Please operate module in suitable temperature. The response time & brightness will drift by different temperature.
6-7 Avoid to display the fixed pattern (exclude the white pattern) in a long period, otherwise, it will cause image stains.
6-8 Be sure to turn off the power when connection of disconnecting the circuit.
6-9 Polarizer scratches easily, please handle it carefully.
6-10 Display surface never likes dirt of stains.
6-11 A dew drop may lead to destruction. Please wipe off and moisture before using module.
6-12 Sudden temperature changes cause condensation, and it will cause polarizer damaged.
6-13 High temperature and humidity may degrade performance. Please do not expose the module to the direct sunlight and so on.
6-14 Acetic acid or chlorine compounds are not friends with TFT display module.
6-15 Static electricity will damage the module; please do not touch the module without any grounded device.
6-16 Do not disassemble and reassemble the module by self.
6-17 Be careful do not touch the rear side directly.

6-18 Not strong vibration or shock. It will cause module broken.
6-19 Storage the modules in suitable environment with regular packing.
6-20 Be careful or injury from a broken display module.
6-21 Please avoid the pressure adding to the surface (front or rear side) of modules, because it will cause the display non-uniformity of other function issue.
6-22 Display warranty period is 18 months
6-23 Please follow the storage environment:
a. Temperature: Room temperature 0--35℃
b. Humidity: (30--75) ％RH.

7. Mechanics specification:

As for the outside dimension, weight of the modules, please refer to product specification for more details