



上海天马微电子有限公司
SHANGHAI TIANMA MICROELECTRONICS CO., LTD.

Shanghai Tianma Micro-Electronics CO.,LTD

TFT-LCD Module Incoming Inspection Standard

Customer	For all customer
Description	入料检验标准
Model Name	TM150XDHG01-02
Date	2020.08.31
Version	1.1

Customer Approval	
Title	
Name	
Date	

	Prepared By	Checked by	Approved By
Title:	FAE	QE	IPM
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Date:	2020.08.31	2020.08.31	2020.09.01

HISTORY OF REVISION

REV NO.	REV DATE	CONTENTS	REMARKS
1.0	2020.07.08	First version	
1.1	2020.08.31	Update pixel defect from(3,3,9) to(3,3,6).	

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1. Scope:

The incoming inspection standards shall be applied to TFT-LCD Modules (hereinafter called "Modules") that supplied by Shanghai Tianma Micro-Electronics Corporation.

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.

Should the customer fail to notify the seller within the inspection period, the buyers right to reject the modules. Shall be lapsed and the modules shall be deemed to have been accepted by the buyer.

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 $25\pm 5^{\circ}\text{C}$

b. Humidity: $(60\pm 10)\% \text{RH}$

c. Illumination: Appearance $700\pm 100 \text{ Lux}$, Display $100\pm 50 \text{ Lux}$ (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 $30\pm 5 \text{ cm}$.

4.3 Viewing Angle

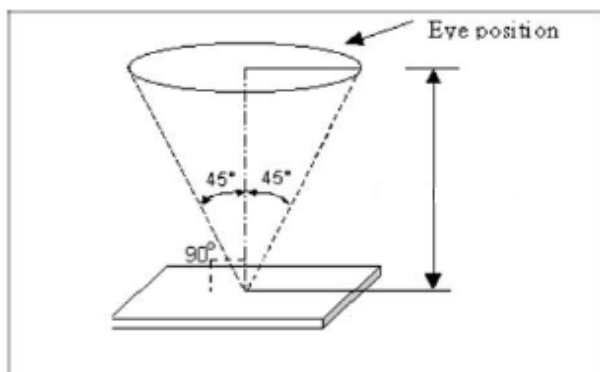
U/D: $45^{\circ}/45^{\circ}$, L/R: $45^{\circ}/45^{\circ}$

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5. Inspection Criteria

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

5.1 Major defect-- Features

Item No	Items to be inspected	Inspection Standard
5.1.1	All functional defects	1) No display 2) Display abnormally 3) line defect All above is not allowed.
5.1.2	Function	Function/component loss not allowed
5.1.3	Crack	Glass Crack not allowed

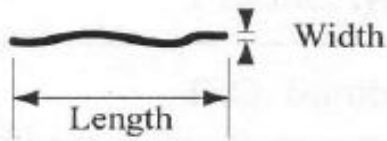
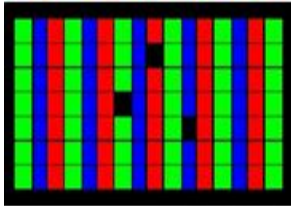
5.2 Minor defect --- Display

Item No	Items to be inspected	Inspection standard
5.2.1	Spot Defect	For dark/white spot is defined $\varphi = (x + y) / 2$

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	Including: Black spot White spot Foreign particle Polarizer bubble/dirt Cell particle	<u>$\Phi > 0.5\text{mm}$ dots distance $\geq 5\text{mm}$</u>	
		Size $\varphi(\text{mm})$	Acceptable Quantity
		<u>$\varphi \leq 0.5$</u>	Ignore
		<u>$0.5 < \varphi \leq 1$</u>	3
		<u>$1 < \varphi$</u>	Not allowed
5.2.2	Line Defect Including Black line White line Scratch	Define: 	
		<u>Line defect distance $\geq 5\text{mm}$</u>	
		Width(mm) Length(mm)	Acceptable Quantity
		<u>$W \leq 0.05$</u>	Ignore
		<u>$0.05 < W \leq 0.1, L \leq 5.0$</u>	<u>6</u>
		<u>$0.1 < W, L \leq 5$</u>	2
5.2.4	Electrical Dot Defect	Bright and Black dot define:  and 	
		Item	Acceptable Quantity
		Dark dot defect	<u>3</u>

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		Bright dot defect	3
		Bright particle	6($\phi < 0.5\text{mm}$)
		Total Dot	6
		Distance between dark dot	$> 5\text{mm}$
5.2.5	Tiny bright dot Dense tiny highlights	Definition of Tiny bright dot: $\Phi < 0.1\text{mm}$; Ignore, clustered is not allowed($N \leq 5, D \leq 5$)	
5.2.6	Mura	Not visible under ND5% filter	
5.2.7	BZL scratches, pits, bumps, uncleanable stains	Do not affect display, assembly, determine OK.	
5.2.8	Protective film	Top injury, scratch, Wear scar, Dirt particle, Undamage polarizer,	Ignore

Note: 1. Dot defect is defined as the defective area of the dot area is larger than 50% of the dot area.

2. Polarizer bubble is defined as the bubble appears on active display area. The defect of polarizer bubble shall be ignored if the polarizer bubble appears on the outside of active display 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 $30 \pm 5\text{cm}$

4. Foreign particle on the surface of the LCM should be ignored.

5. Displaying foreign body points using single eye determination

6. AA (Active Area) area, the display area, ie, the effective product display area, is a poor type of control area for the electrical measurement display. VA (View Area) area, viewable area, that is, the area that can be visually seen after the product is installed on the customer's entire machine.

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6. Mechanics specification

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

7. Precaution

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

- 7-1 Do not twist or bend the module and prevent the unsuitable external force for display module during assembly.
- 7-2 Adopt measures for good heat radiation. Be sure to use the module within the specified temperature.
- 7-3 Avoid dust or oil mist during assembly.
- 7-4 Following the correct power sequence while operating. Do not apply the invalid signal, otherwise, it will cause improper shut down and damage the module.
- 7-5 Less EMI: it will be more safety and less noise.
- 7-6 Please operate module in suitable temperature. The response time & brightness will drift by different temperature.
- 7-7 Avoid to display the fixed pattern (exclude the white pattern) in a long period, otherwise, it will cause image stains.
- 7-8 Be sure to turn off the power when connection of disconnecting the circuit.
- 7-9 Polarizer scratches easily, please handle it carefully.
- 7-10 Display surface never likes dirt or stains.
- 7-11 A dew drop may lead to destruction. Please wipe off and moisture before using module.
- 7-12 Sudden temperature changes cause condensation, and it will cause polarizer damaged.
- 7-13 High temperature and humidity may degrade performance. Please do not expose the module to the direct sunlight and so on.
- 7-14 Acetic acid or chlorine compounds are not friends with TFT display module.
- 7-15 Static electricity will damage the module, please do not touch the module without any grounded device.
- 7-16 Do not disassemble and reassemble the module by self.
- 7-17 Be careful do not touch the rear side directly.
- 7-18 Not strong vibration or shock. It will cause module broken.
- 7-19 Storage the modules in suitable environment with regular packing.
- 7-20 Be careful or injury from a broken display module.
- 7-21 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.