AUO DISPLAY PLUS CORPORATION

Specification for Approval

INCOMING INSPECTION STANDARD FOR

P320HVN02 series Modules A Grade TFT-LCD MODULES

The content of this technical information is subject to change without notice. Please contact ADP or its agent for further information.

Approved by	Prepared by
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Customer	Checked & Approved by
Litsource	

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1. Scope:

The incoming inspection standards shall be applied to TFT-LCD Modules (hereinafter called "Modules") that supplied by AUO Display Plus Corporation or ADP (hereinafter called "seller").

2. Incoming inspection:

The buyer (customer) shall inspect the modules within twenty calendar days sincethe delivery date (the "inspection period") at its own cost. The results of the inspection (acceptance or rejection) shall be recorded in writing, and a copy of this writing will be promptly sent to the seller.

The buyer may, under commercially reasonable rejection procedures, reject an entire lot in the delivery involved. Within the inspection period, if the samples of modules within a lot show a number of unacceptable defects in accordance with this incoming inspection standards, the buyer must notify the seller in writing of any such rejection promptly, and not later than within three business days of the end of the inspection period.

Should the buyer fail to notify the seller within the inspection period, the buyer's 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:

Unless agreed in writing, the method of incoming inspection shall be based on MIL-STD-105E.

3-1 Sampling type: Normal inspection, single sampling.
3-2 Sampling level: Level II.
3-3 Acceptable quality level (AQL):
Major defect: AQL=1.0%.
Minor defect: AQL=2.5%.

4. Inspection instruments:

4-1 Pattern generator: Chroma-LCM tester 27012 or equivalent.
4-2 Video board: ADP video board or equivalent. The output of the signal should comply with the specifications provided by ADP.

5. Inspection environment conditions

5-1 Ambient condition
A. Temperature: 20 ~ 25℃
B. Humidity: 65±5% RH.

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C. Lumination: A single 20W fluorescent lamp (300 to 700 Lux)

5-2 Viewing distance

Be at a distance about 100±5 cm in front of LCD module with naked eyes.

5-3 Viewing Angle

Viewing line should be perpendicular to the surface of the module.

6. Classification of defects:

Defects are classified as major defects and minor defects according to the defect classification defined herein.

6-1 Major defects:

A major defect is a defect that is likely to result in failure, or to reduce materially the usability of the product for its intended purpose.

6-2 Minor defects:

A minor defect is either a defect that is not likely to reduce materially the usability of the product for its intended purpose, or a stray from an intended purpose with little bearing on the effective usage

Specific criteria of judgment on major and minor defects shall be in accordance with " the Classification of Defect " table below.

Defect items	Criterion for defects	Severity
Line Defect	Not allowed any vertical, horizontal and cross line	Major
Foreign Material	Shall be in accordance with the item 7.3 “Foreign Material” in this standard	Minor
Polarizer Defect	Shall be in accordance with the item 7.2 “Polarizer Defect” in this standard	Minor
Dot Defect	Shall be in accordance with the item 7.1 ”Dot defect” in this standard	Minor
Mura	Shall be in accordance with the item 7.5 ”Mura” in this standard	Minor

7. Inspection Criteri

Electrical Inspection

7.1 Dot Defect

A. Every dot herein means a Sub-Pixel (each Red, Green or Blue color).

B. Bright Dot defect is defined as that the defective area of the dot is larger than 50% of the dot area and should be visible under 2% ND filter.

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7.1-1 Bright Dot

Bright Dot is defined as Dot (sub-pixel), which appears bright on the screen when the LCD module displayed at dark pattern.

Inspection Item	Criteria
R.G or B 1 dot	0
Adjacent 2 dots (horizontal and vertical)	≦0 pairs

A partial bright dot damaged less than half size of sub-pixel is not counted as a bright dot defect and should be specified below.

Inspection Item	Criteria
5% ND filter Not-visible	Ignored
5% ND filter Visible 2% ND filter Not-visible	Max. 7 allowed
2% ND filter Visible	Max. 4 allowed

7.1-2 Dark Dot

Dark Dot is defined as Dot (sub-pixel), which appears dark on the screen when the LCD Module displays at bright pattern.

Inspection Item	Criteria
R.G or B 1 dot	Max. 6 allowed
Adjacent 2 dots (horizontal and vertical)	≦ 1 pairs
Adjacent 3 dots (horizontal and vertical)	≦0 pairs

7.1-3 Total Dot

Total amount of Dot Defects	Max. 6 allowed

Appearance Inspection

7.2 Polarizer Defects

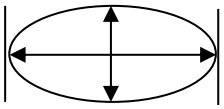
A. Extraneous substances that can be wiped out such as Finger Prints, particles are not considered defects.

B. Defects on the Black Matrix (outside the Active Area) are not considered defects.

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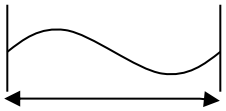
Inspection Items	Criteria
Linear Scratch	0.07<W≦0.2, L≦15, N≦4
Bubble/Dent	0.5<D≦1.5, N≦5

Where, W (mm): Width
L (mm): Length
D (mm): Average diameter



D = (a+b)/2

Note) Linear: a > 2b,　Circular : a ≦ 2b

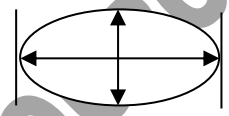


L = Longest point

7.3 Foreign Material

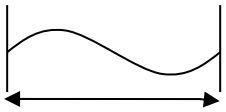
Inspection Items	Criteria
Linear	0.15＜W≦0.2, L≦15, N≦4
Circular	1.0<D≦1.5, N≦4

Where, W (mm): Width
L (mm): Length
D (mm): Average diameter



D = (a+b)/2

Note) Linear: a > 2b,　Circular : a ≦ 2b



L = Longest point

7.4 Bezel Appearance

Scratches, minor bents, stains, rusty spot and particles on the Bezel frame are not considered defects.

7.5 Mura

All kinds of Mura shall be invisible while 2% ND filter apply. Movable Mura should be ignored if the Mura disappear after lightly patting on the Mura area.

And the line defect can be counted as Mura which can be invisible at L128 pattern while 2% ND filter applied.

8. Inspection judgment:

8.1 If the number of defects is more than the applicable acceptance level, the lot shall be rejected and the buyer should inform the seller of the result of incoming inspection in writing.

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8.2 Issues which is not defined in this criteria shall be discussed by both parties, Customer and Supplier, for better solutions.

9. Precaution:

Please pay attention to the following items when you use the LCD Module.

9.1 Do not twist or bend the module and also avoid any inappropriate external force on display surface during assembly.
9.2 Adopt good ventilation measures. Be sure to use the module within the specified temperature range.
9.3 Avoid dust or oil mist during assembly.
9.4 Follow the correct power sequence while operating. Do not apply the invalid signal otherwise it will cause unexpected shutdown that damages the module.
9.5 The response time & brightness might vary at different temperature.
9.6 Less EMI: it will be more safety and less noise.
9.7 Avoid displaying at certain pattern (e.g. the white pattern) for a long time otherwise it might cause image sticking.
9.8 Be sure to turn off the power while connecting or disconnecting the circuit.
9.9 Display surface Polarizer scratches easily, please avoid dirt or stain on it and handle with care.
9.10 A dewdrop may cause malfunction or worse situation. Wipe off any before using the LCD module.
9.11 Sudden temperature change might cause condensation of materials and possible polarizer damage.
9.12 High temperature and high humidity might undermine the performance. Do not expose the module to the direct sunlight and so on.
9.13 Avoid any acetic acid or chlorine compounds, which are harmful to the LCD module.
9.14 Static electricity might damage the LCD module. Avoid direct touch of the module without any grounded device connected.
9.15 Do not disassemble and reassemble the module by yourself.
9.16 Do not touch the rear of the LCD module directly to avoid possible electric shock by the high voltage of backlight. Make sure the power is off before proceeding.
9.17 Avoid any strong vibration or shock, which might cause a broken LCD module.
9.18 Store the modules in cool and dry environment with regular packing.
9.19 Be careful of possible injury caused by a broken module. Also avoid the pressure added onto the (front or rear) surface of modules, which might cause non-uniformity or other function issue to display.

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