

PREPARED BY: DATE	<h1>SHARP</h1> <p>TFT LIQUID CRYSTAL DISPLAY GROUP SHARP CORPORATION INCOMING INSPECTION STANDARDS</p>	No.
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		APPLICABLE DIVISION TFT DIVISION 2 TFT LCD GROUP

**INCOMING INSPECTION STANDARDS FOR TFT-LCD**

**MODEL No.**

**LQ133X1LH27**

CUSTOMER'S APPROVAL

DATE \_\_\_\_\_

BY \_\_\_\_\_

PRESENTED BY K. Sogame

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 SHARP CORPORATION

**SHARP****INCOMING INSPECTION STANDARDS FOR TFT-LCD MODULES****1. Scope**

These incoming inspection standards shall apply to TFT-LCD modules (hereinafter called "MODULE") supplied by Sharp Corporation (hereinafter called the "Seller") to \_\_\_\_\_ (hereinafter called the "Buyer").

**2. Incoming inspection**

The Buyer shall have the right to conduct at its own cost and expense, an incoming inspection of the MODULE's at the destination specified in the relevant bills of lading in accordance with the MODULE's specifications separately agreed upon and the inspection standard set forth in this Article. The Buyer shall notify the Seller writing of a result of such inspection judgement (acceptance or rejection) in accordance with the said inspection standard within 40 days after the date of the bills of lading. Should the Buyer fail to so notify the seller within the said 40 days period, the Buyer's right to reject the MODULE's shall then lapse, and the said MODULE's shall be deemed to have been accepted by the Buyer.

**3. Method of incoming inspection**

Unless otherwise agreed in writing, the method of incoming inspection shall be in accordance with a sampling inspection based on ISO 2859.

**4. Classification of defects**

Defects are classified as major defect and a minor defect according to the degree of defect defined herein.

**a) Major defect**

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.

**b) Minor defect**

A minor defect either is a defect that is not likely to reduce materially the usability of the product for its intended purpose, or is a departure from an established having little bearing on the effective use or operation of the product.

Specific criteria of judgement on major and/or minor defects or otherwise shall be in accordance with the attached "Classification of Defect."

**5. Acceptable quality level ("AQL")**

The AQL for major and minor defects shall be respectively set forth below.

a) Major defects : AQL : 0.25

b) Minor defects : AQL : 0.65                      Based on overall evaluation

**SHARP****6. Method of sampling inspection**

- a) Lot size : Quantity per shipment lot per model
- b) Sampling type : Normal inspection, Single sampling
- c) Inspection level : II
- d) Sampling table : Table in ISO 2859
- e) Inspection conditions : The inspection conditions shall be as in the LCD specifications. The environmental conditions and the visual inspection shall be as follows :
  - (i) The environmental conditions
    - Room temperature : 20 - 25 °C
    - Humidity : 65 ± 5% RH
  - (ii) The external visual inspection : The inspection shall be conducted by using a single 20W fluorescent lamp for illumination and the distance between the MODULE and the eyes of the inspector shall be 35cm or more.

**7. Determination of acceptability and subsequent disposal**

If the number of defects found in the sample MODULE's from the lot is equal to or less than the applicable acceptance level, the lot shall be accepted.

If the number of defects is greater than the applicable acceptance level, the lot shall be rejected. The Buyer shall inform the Seller of a detailed result of such inspection within the time period stipulated in Article 2.

The disposal is as follows :

a) Accepted lot

An acceptance under the above incoming inspection shall constitute an acceptance by the Buyer of such lot of the MODULE's in terms of the landed quality thereof.

b) Rejected lot

If a lot of PRODUCTS is rejected under the above incoming inspection due to any defects for which the Seller is responsible and such a fact is clearly confirmed by the Seller, the Seller shall exercise one of the following three options. This must be determined with mutual consent and shall be confirmed by the Seller. The best choice of the options shall be left to the Seller's discretion and the Seller shall advise the Buyer of its choice not later than two weeks of receipt of the Buyer's advice :

1. The Buyer shall return the defective lot to the place to be designated by the Seller and the Seller shall screen all of the PRODUCTS in the lot and repair defective PRODUCTS.
2. The Seller shall screen all of the PRODUCTS in the lot and repair defective products within a reasonable time period at the Buyer's facility.
3. The Buyer shall screen the entire lot for the good modules at the expense of the Seller to be separately agreed upon. The rejected PRODUCTS shall be returned to the place to be designated by the Seller.

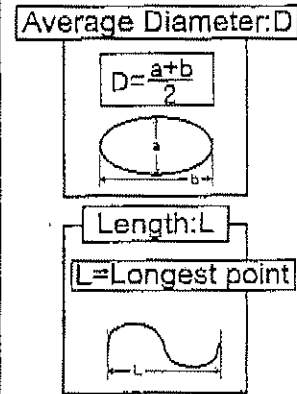
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**8. External inspection**

The area for external inspection is active area plus 1.0mm width.(Upper, Lower, Left and Right)  
The distance between the MODULE and the eyes of the inspector shall be 35cm or more.

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

Items to be inspected		Inspection standards (Acceptable level)
Extraneous substances	Black spots	Circular foreign material Black spots which appear when B/L operating $0.15 \leq D \leq 0.5$ , $N \leq 4$
	Lint	Lints which appear when module operating $0.01 \leq W \leq 0.07$ $0.3 \leq L \leq 1.0$ $N \leq 4$
Scratches		Scratches on the polarizer (*1) $0.01 \leq W \leq 0.1$ $0.3 \leq L \leq 5.0$ $N \leq 3$
Dent		Dent on the polarizer (*1) $0.15 \leq D \leq 0.5$ , $N \leq 6$
Total External Defect		$N \leq 7$



\*1 The inspection shall be conducted by using a single 20W fluorescent lamp for illumination.  
The panel is not operating.

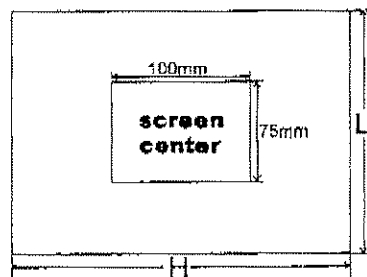
**9. Dot defect**

9-1. Inspection Conditions [Visual inspection]

- Viewing distance : 35cm
- Ambient illumination : 300 to 700Lux(Standard 500Lux)
- Ambient temperature : 20-25 °C
- Light source condition : Based on the specification

Note: Viewing angle : The surface of the MODULE and the eyes of the inspector shall be 90 degrees.

9-2. Zone



- ※ H × L : Whole screen
- ※ Please refer to the effective display area (active area) of specification about H and L.

9-3. Definition

a) Bright dot

- Count : defect area > 1/2dot
- No count : defect area < 1/2dot

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- b) Scratches on the color filter (Bright dot count)
  - Count : Visible over the half of a dot
  - No count : Visible under the half of a dot
- c) Scratches on the Black mask (Bright dot count)
  - Count : Visible over 50  $\mu$  m  $\phi$
  - No count : Visible under 50  $\mu$  m  $\phi$

9-4. Bright dot (Acceptable)

·Green/Red/Blue dots : When the MODULE lights, dots appear bright in display at black picture position. (V0)

Check pattern	screen center	Total Quantity
Black picture position	1 MAX	3 MAX

- Green Bright dot ... 2 dots MAX.
- Joined two bright dots ... G - G : nothing  
Other than G - G : 2 pair MAX
- Joined three bright dots must be nil
- Defect distance ... more than 15mm

9-5. Black dots (Acceptable)

·Black dots : When the MODULE lights,dots appear black in display at each of Green, Blue or Red picture position.

Check pattern	Total
each of Green, Blue or Red picture position	Three picture position total 7 MAX

- Joined two dots ...3 pair MAX
- Joined three dots must be nil.
- Defect distance ... more than 5mm

9-6. Total dot defect (Black and Bright dot)

·Total dot defects:Total quantity of Bright dots and Black dots at gray screen(V24).

Check pattern	Total Quantity
V24 gray screen	8 MAX

**10. Display non-uniformity**

There should be no distinctly visible non-uniformity through 5% transparency of filter.

- Viewing distance : 35cm
- Ambient illumination : 300 to 700 Lux (standard 500Lux)
- Ambient temperature : 20-25 °C
- Light source condition : Based on the specification.

Note : Viewing angle: The surface of the MODULE and the eyes of the inspector shall be 90 degrees.

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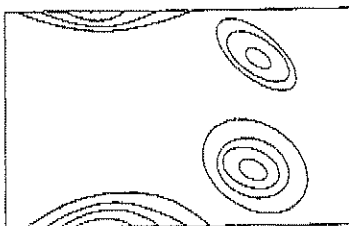

**11. An afterimage (Acceptable level)**

After displaying a fixed pattern for 30 minutes, afterimage disappears within 10 seconds.

**12. Others**

If any problems arise about mentioned items in this document and other items, the user of the TFT-LCD module and Sharp will cooperate and make efforts to solve the problems with mutual respect and good will.

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**Classification of defect**

Inspection item	Criterion for defects	Defect type	
Operating Frequency	Does not meet specified range in the spec	Major	
Current Consumption	Does not meet specified range in the spec	Major	
Contrast ratio	Does not meet specified range in the spec	Major	
Display-on inspection	The condition of this inspection is as follows Viewing angle* : $\theta 21 \leq \theta \leq \theta 22, \theta 11 \leq \theta \leq \theta 12$ Supply voltage : std value in the spec * $\theta 11, \theta 12, \theta 21, \theta 22$ is to be considered as the std value in the spec. With the following display pattern input, a correct display pattern is not obtained.	Major	
	a) All dots light up or all dots don't light up b) For each line, the alternate light up or alternate lines light up c) Predetermined figure and character pattern		
	Vertical line defect		Major
	Horizontal line defect		Major
	Cross line defect		Major
Scratches and dent on the polarizer	Shall be accordance with the item 8 'external inspection' on the incoming inspection std.	Minor	
Polarizer inclination bubbles	Shall be accordance with the item 8 'external inspection' on the incoming inspection std.	Minor	
Black spot or alien substance in the panel	Shall be accordance with the item 8 'external inspection' on the inspection std.	Minor	
Bezel appearance	Deep damage is found on plating, the ground metal is exposed, and rust may occur. (Plating or coating un-uniformity is ignored.)	Minor	
Damaged parts	a) Part lead wire is disconnected.	Major	
	b) The part lead wire is not yet disconnecting, but is damaged.	Minor	
	c) Failure is found concerning function or performance, or product value is impaired in appearance.	Major	
Bezel claw	a) Bezel claw missing or not bent	Major	
	b) The bezel claw is not bent sufficiently	Minor	
Bright dot	Exceed 'standard' specified item 9-3 in the incoming inspection standard (flashing is normally dot defect count)	Minor	
Torn color filter	Exceed 'standard' specified item 9-3 in the incoming inspection standard	Minor	
Torn black mask	Exceed 'standard' specified item 9-3 in the incoming inspection standard	Minor	
Black dot	Exceed 'standard' specified item 9-3 in the incoming inspection standard	Minor	
Defect distance	Within the distance specified item 9-3 in the incoming inspection standard	Minor	
Display non-uniformity	There should be non-uniformity through 5% transparency of filter	Minor	
Block Shade	There should be non-uniformity through 5% transparency of filter	Minor	
Afterimage	After displaying a fixed pattern for 30 minutes, afterimage disappears within 10 seconds	Minor	
Newton Ring	Newton Ring is visible like ringed brightness uneven on white or red picture position. *Ring number --- 3 MAX	Minor	
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