


TO:	 <p>Display Device Business Group SHARP CORPORATION</p> <p>Incoming Inspection Standards</p>	ISSUE	Nov. 27 ,2013
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		<p><b>Applicable Division</b> Display Device Business Division</p>	

Incoming Inspection Standards for CG-SiliconTFT—LCD

**LS027B7DH01A**

Date

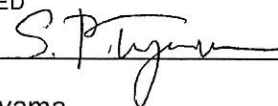
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BY

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PRESENTED

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SHARP CORPORATION

**SHARP**

RECORDS OF REVISION			First issue	Nov. 27 ,2013
			First File No.	LDI-1302702
			Model	LS027B7DH01A
DATE	REVISED	SUMMARY	Check & APPROVAL	
Nov.27,2013		First issue LDI-1302702	S.Murayama	

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

These incoming inspection standards shall apply to CG-silicon TFT-LCD modules (hereinafter called "MODULE") supplied by Sharp Corporation (hereinafter called the "Seller") to SMA (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 judgment (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 2859-1.

- a) Lot size : Quantity per shipment lot per model
- b) Sampling table : Table in ISO 2859-1
- c) Inspection level : General inspection level II
- d) Sampling type : Single sampling plan for normal inspection

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

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

- a) Major defects : AQL 0.4
- b) Minor defects : AQL 1.0                      Based on overall evaluation

**5. 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.

- Function defect

- Abnormal operation including distinct black line defect and /or white line defect.

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.

- |                           |                        |
|---------------------------|------------------------|
| 1. Dot Defect             | 4. Scratches           |
| 2. Display non-uniformity | 5. Dents               |
| 3. Foreign particles      | 6. Current dissipation |

**6. 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

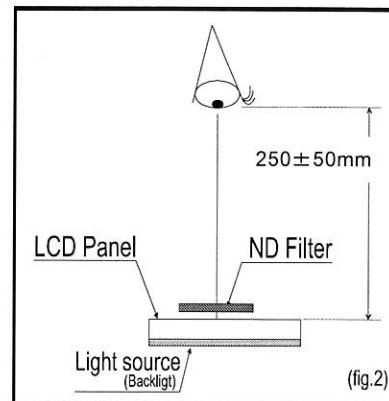
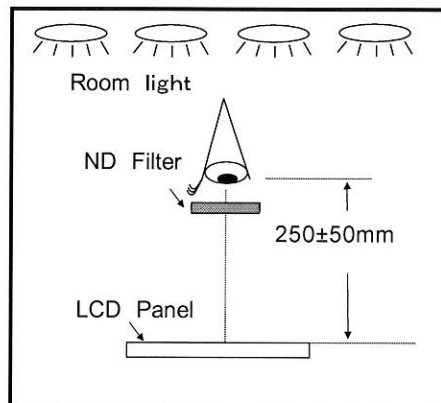
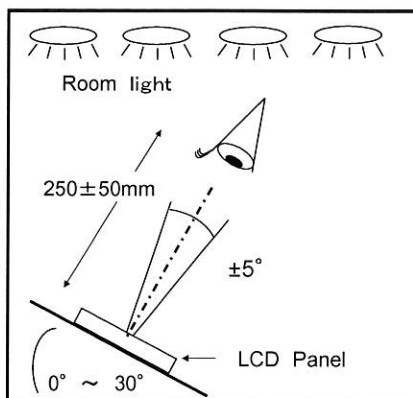
If a lot of PRODUCTS is rejected under the above incoming inspection due to any defects for which the Seller is responsible and such a fact is clearly confirmed by the Seller, the Seller shall exercise one of the following three options. This must be determined with mutual consent and shall be confirmed 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

## 7. Inspection conditions

Item	Inspection conditions	
	Reflection inspection (fig.1) (Cosmetic & appearance inspection)	Inspection with back light
Panel surface illumination	1000 ± 250 lx	Use Back light* (4300cd/m2±430cd/m2)
Light source	Fluorescent tube	LED (Back light)
Ambient illumination	More than 750 lx	300 ~ 700 lx
Ambient temperature	20 ~ 25 °C	←
Ambient Humidity	50 ~ 80%RH	←
Viewing distance	250 mm ± 50 mm	←
Direction of lighting	Set light tube without reflection on the panel surface	—
Viewing angle	The surface of the Module and the eyes of the inspector shall be 90 ± 5 degrees.	←
How to use ND filter	Use ND filter close to eyes (Fig.1)	Use ND filter close to panel (fig.2)
Check pattern (White dot)	Black picture position	←
Check pattern (Black dot)	White picture position	←

- Please refer to the panel surface brightness of the specifications



(fig.1 : Reflection inspection) (fig.2: Inspection with back light )

## 8. Appearance inspection

### 8.1 FPC appearance inspection

#### a. FPC part

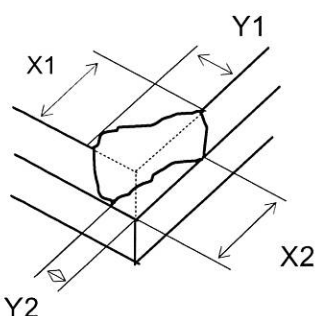
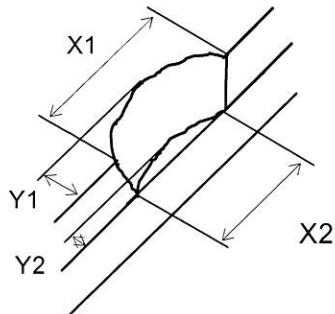
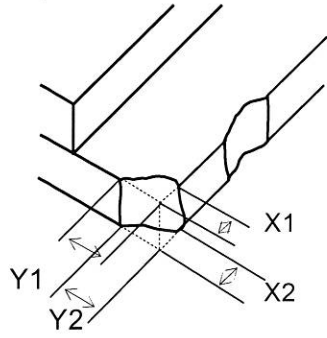
- \* There is no scratch which reaches copper foil. (Do not allow expand.)
- \* There is no peel off of Film/Stiffener.
- \* There is no pattern disconnection.

#### b. Input terminal part

- \* There is no non-plating part.
- \* There is no scratch and/or dent with possibility of pattern disconnection.
- \* There is no stain with possibility of loose connection.

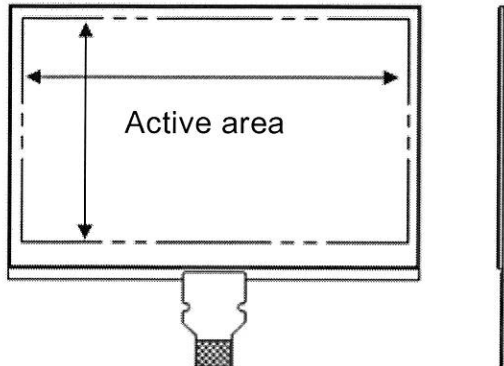
## 8.2 Glass edge crack/chip

[Glass edge crack/chip]

Items	Inspection criteria (Acceptable level)
<p>① Chip on glass corner (except terminal part)</p> 	<ul style="list-style-type: none"> <li>▪ <math>X1 \leq 1.0\text{mm}</math> and <math>Y1 \leq 5.0\text{mm}</math> or <math>X1 \leq 5.0\text{mm}</math> and <math>Y1 \leq 1.0\text{mm}</math> (However, <math>X1+Y1 \leq 5.0\text{mm}</math>)</li> <li>▪ <math>X2 \leq 1.0\text{mm}</math> and <math>Y2 \leq 5.0\text{mm}</math> or <math>X2 \leq 5.0\text{mm}</math> and <math>Y2 \leq 1.0\text{mm}</math> (However, <math>X2+Y2 \leq 5.0\text{mm}</math>)</li> </ul>
<p>② Chip on glass edge (except terminal part)</p> 	<ul style="list-style-type: none"> <li>▪ <math>X1 \leq 10.0\text{mm}</math> and <math>X2 \leq 10.0\text{mm}</math></li> <li>▪ <math>Y1 \leq 1.0\text{mm}</math> and <math>Y2 \leq 1.0\text{mm}</math></li> </ul>
<p>③ Chip on the terminal glass</p> 	<ul style="list-style-type: none"> <li>▪ <math>X1 \leq 3.0\text{mm}</math> and <math>X2 \leq 3.0\text{mm}</math></li> <li>▪ <math>Y1 \leq 3.0\text{mm}</math> and <math>Y2 \leq 3.0\text{mm}</math></li> <li>▪ FPC and/or patterns are not affected.</li> <li>▪ Crack and/or Chip does not reach the pattern.</li> </ul>

## 9. Cosmetic inspection

### 9.1 Active area (58.8mmx 35.28mm)



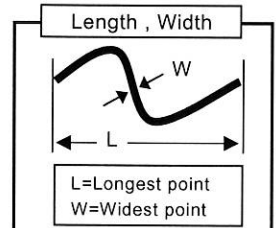
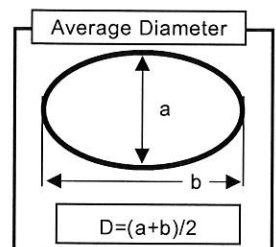
### 9.2 Dot Defect

Item	Allowable number
White dot	2
Black dot	2
Blinking white dot/ black dot	2
Total(White dot+Black dot)	2

### 9.3 Cosmetic items

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

Item	Inspection criteria	Allowable
Foreign particles, stain (Circular shape)	$D \leq 0.1$	ignore
	$0.1 < D \leq 0.15$	3
	$0.15 < D \leq 0.2$	1
	$D > 0.2$	0
Foreign particles, stain (Liner shape)	$L \leq 2.0$ and $W \leq 0.01$	ignore
	$L \leq 2.0$ and $0.01 < W \leq 0.02$	2
	$L \leq 1.0$ and $0.02 < W \leq 0.03$	1
	$L > 2.0$ or $W > 0.03$	0
Judged on white or black picture position		



\*The scratch of the front polarizer is judged in the above.

\*It doesn't become a problem on the function (on the performance), that the scratch, dent and dirt on back of the panel are allowed.

\*Inspection area: Active area and viewing area,

### 9.4 Display non-uniformity(Seen on white or black picture position)

There should be no distinct non-uniformity visible through 2 % ND filter.

## 10. Others

If some 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.