

# NAN YA PLASTICS CORPORATION

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SPECIFICATION OF  
LCD MODULE  
PRODUCT NO.: LTBFAN582P1XCS\_

SPEC. NO.: LM582-1B-

CUSTOMER
APPROVED BY
DATE:

LCD DEPARTMENT  
ELECTRONIC MATERIALS DIVISION  
NAN YA PLASTICS CORPORATION  
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EDITED ON : Oct. 24. 2007

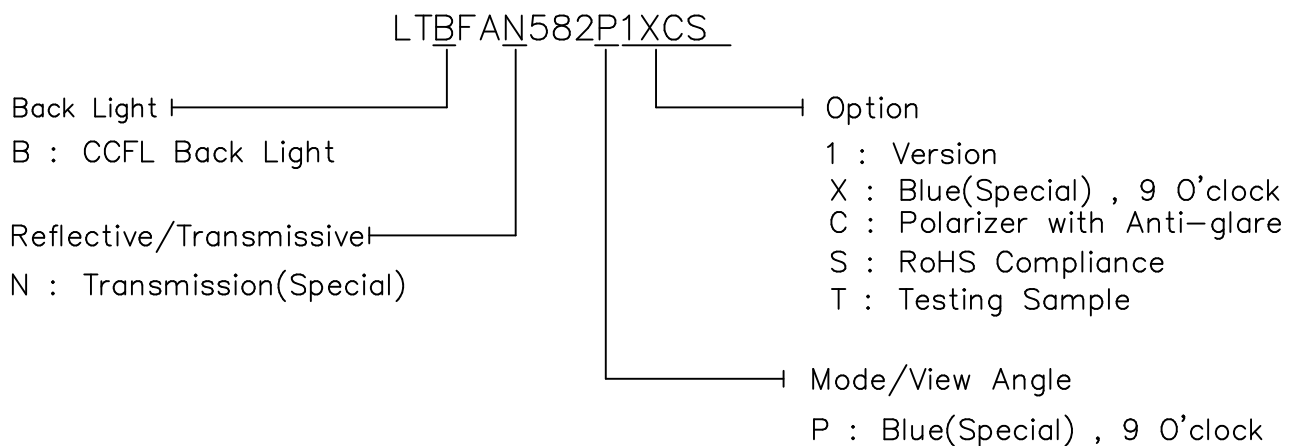
Q.C. DEPT.	DESIGN MANAGER	DESIGN CHECK	DESIGNER
			W. R. HSU



# 1. MECHANICAL DATA

NO	ITEM	CONTENTS	UNIT
1	Product No.	LTBFAN582P1XCS_	-
2	Module Size	155.5 (W) x 104.5 (H) x 7.0 (D)	mm
3	Dot Size	0.23 (W) x 0.23 (H)	mm
4	Dot Pitch	0.25 (W) x 0.25 (H)	mm
5	Number of Dots	480 (W) x 320 (H)	Dot
6	Duty	1/320	-
7	LCD Display Mode	STN, Blue(Special) Mode	-
8	Rear Polarizer	Transmissive(Special) Type	-
9	Viewing Direction	9	O'clock
10	Backlight	CCFL	-
11	Controller	Excluded	-
12	DC/DC Converter	Excluded	-
13	Touch Panel	Excluded	-
14	Weight	126(Approx.)	g

Note :



**RoHS Compliance.**

Nan Ya guarantees that this project doesn't include any materials (6 materials) or includes less than specified quantities which are regulated by RoHS Compliance.

REV/DATE	R0/ 12.20.05'				BY W.R.HSU
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## 2. ABSOLUTE MAXIMUM RATINGS

### (1) ELECTRICAL ABSOLUTE RATINGS

VSS=0V STANDARD

ITEM	SYMBOL	MIN	MAX	UNIT	COMMENT
Power Supply for Logic	VDD-VSS	-0.3	7.0	V	
Power Supply for LCM	VLCD-VSS	0	30.0	V	
Input Voltage	VI	-0.3	VDD	V	
Static Electricity	-	-	-	-	Note 1

### (2) ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE	
	MIN.	MAX.	MIN.	MAX.
Ambient Temperature	0	50	-20	70
Humidity (Without Condensation)	Note 2,4		Note 3,4	
Vibration	-	2.54m/s <sup>2</sup> (0.25G) Note 5	-	11.76m/s <sup>2</sup> (1.2G) Note 5,6
Shock (XYZ Directions)	-	29.4m/s <sup>2</sup> (3G)	-	490.0m/s <sup>2</sup> (50G) Note 6

Note 1 LCM should be grounded during handling LCM.

Note 2 Ta ≤ 50°C : 80%RH max

Note 3 Please refer to item of reliability test

Note 4 Background color will change slightly depending on ambient temperature.  
This phenomenon is reversible.

Note 5 5Hz~100Hz(Except resonant frequency and X,Y,Z each direction within 1 hour)

Note 6 The module should be operated normally after finishing the test.

### 3. ELECTRICAL CHARACTERISTICS

#### 3-1. ELECTRICAL CHARACTERISTICS OF LCM

ITEM			SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT		
Power Supply for Logic			VDD-VSS	-	2.7	3.3	3.45	V		
Recommended LC Driving Voltage			VLCD-VSS	Duty=1/320	0°C	22.2	22.5	22.8	V	
					25°C	21.7	22.0	22.3		
					50°C	20.9	21.2	21.5		
Input Voltage			VIH	H level	0.8VDD	-	VDD	V		
			VIL	L level	0	-	0.2VDD			
Power Supply Current			IDD	Ta = 25°C FLM = 75 Hz VDD= 3.3 V VLCD-VSS= 22.0 V	-	2.0	4.0	mA		
					ILCD	PATTERN : □ ■ □ ■ □ ■ □ ■ ■ □ ■ □ ■ □ ■ □	-	7.7	11.5	mA
							PATTERN : Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q	-	6.8	10.0
LCM	Surface Luminance	CCFL	L	IL=5mA PATTERN: (Dots All On)	100	135	-	cd/m <sup>2</sup>		
					-	25	40			

### 3-2.ELECTRICAL CHARACTERISTICS OF BACKLIGHT

Used Lamp Rating

Temp.=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Lamp Voltage	$V_L$	-	359	-	Vrms	-
Lamp current	$I_L$	-	5	-	mArms	-
Lamp power consumption	$P_L$	-	1.8	-	W	(*1)
Starting voltage	$V_s$	-	-	520	Vrms	Ta=25°C
		-	-	570	Vrms	Ta=0°C
Lamp life time	$L_L$	-	20000	-	hrs	at $I_L = 5$ mArms Ta=25°C (*2)

(\*1) Power consumption excluded inverter loss .

(\*2) Lamp life time is defined as follows : The final brightness is at 50% of original brightness.

## 4.OPTICAL CHARACTERISTICS

AT Vop

ITEM  MODE		Cr(Contrast Ratio)						$\theta$ (Viewing Angle)		$\phi$ (Viewing Angle)	
		0°C		25°C		50°C		25°C		25°C	
		MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.
N	PX	2.5	4.0	3.0	4.5	2.5	4.0	-	F: 32 R: 32	-	L: 42 R: 25
note		NOTE 6						NOTE 5			

note:

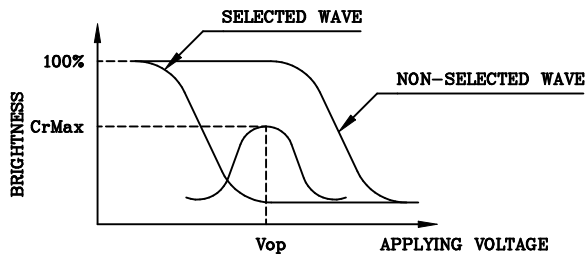
N : TRANSMISSION(SPECIAL)      PX: BLUE(SPECIAL) , 9 O'CLOCK

AT  $\phi=0^\circ$   $\theta=0^\circ$

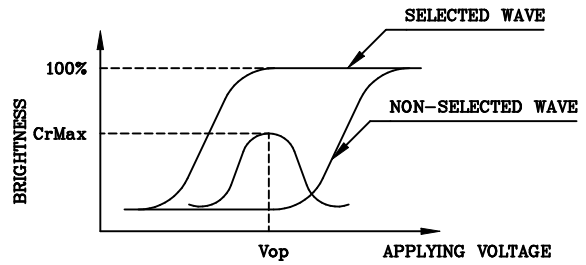
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Response Time (rise)	Tr	0℃	650	800	1200	ms	NOTE 2
		25℃	190	240	360		
		50℃	100	130	190		
Response Time (fall)	Tf	0℃	420	520	780	ms	NOTE 2
		25℃	160	200	300		
		50℃	70	90	135		

(NOTE 1)

Definition of Operation Voltage(Vop)



(positive type)



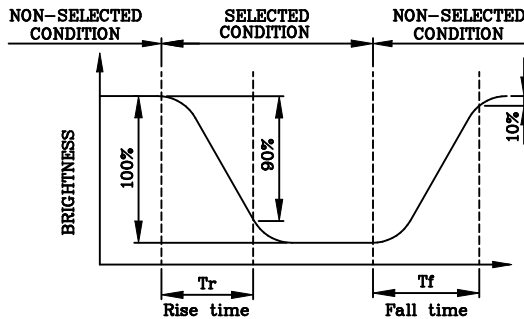
(negative type)

\*Conditions

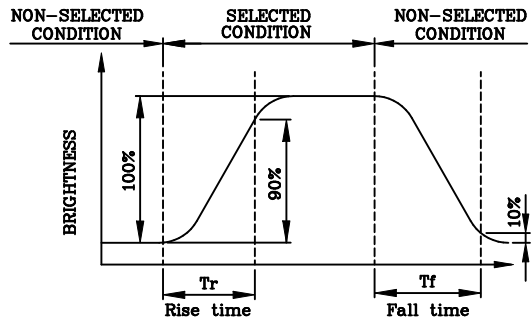
Viewing Angle : 0  
Frame Frequency : 70Hz  
Applying Waveform : 1/N duty 1/a bias

(NOTE 2)

Definition of Response Time(Tr,Tf)



(positive type)



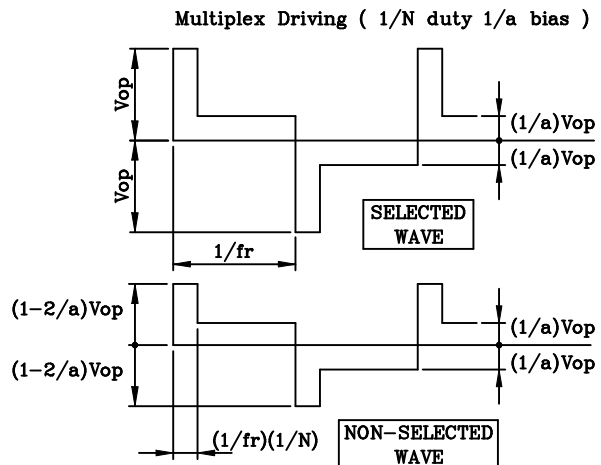
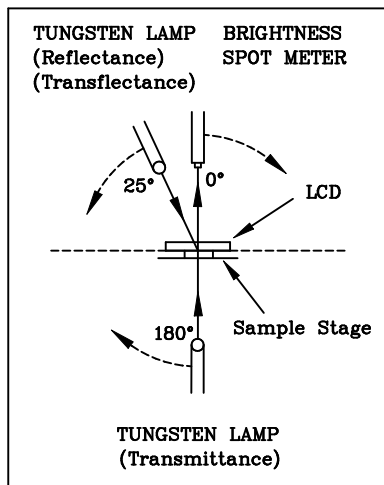
(negative type)

\*Conditions

Operating Voltage : Vop  
Viewing Angle ( $\theta, \phi$ ) : (0,0)  
Frame Frequency : 70Hz  
Applying Waveform : 1/N duty 1/a bias

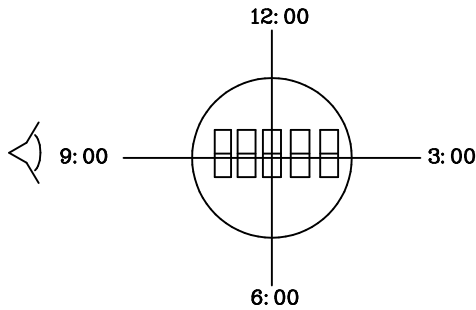
(NOTE 3)

Description of Measuring Equipment and Driving Waveforms



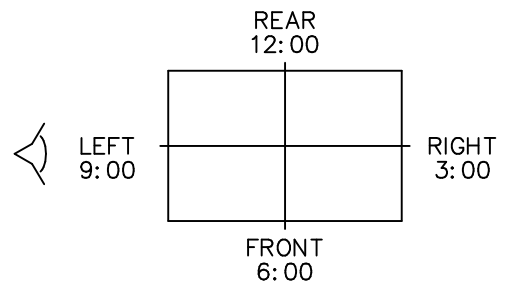
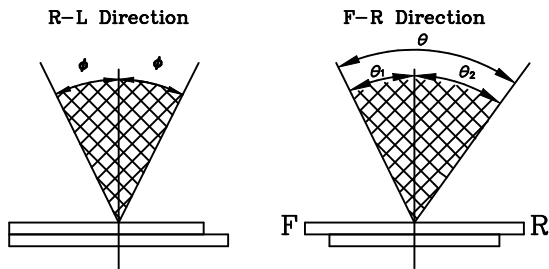
(NOTE 4)

Definition of Viewing Direction



(NOTE 5)

Definition of Viewing Angle



\*For This Product  
 The Viewing Direction Is 9 O'clock

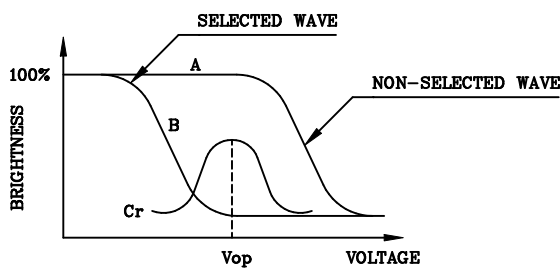
$$\theta = \theta_1 + \theta_2$$

\*Conditions

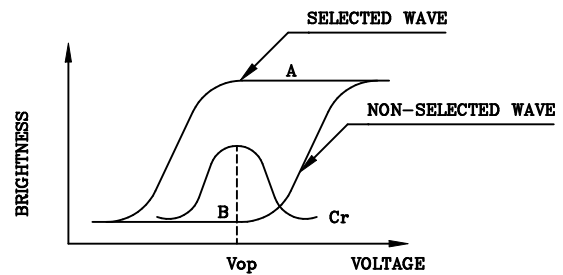
Operating Voltage :  $V_{op}$   
 Frame Frequency : 70Hz  
 Applying Waveform : 1/N duty 1/a bias  
 Contrast Ratio : larger than 2

(NOTE 6)

Definition of Contrast Ratio (Cr)



(positive type)



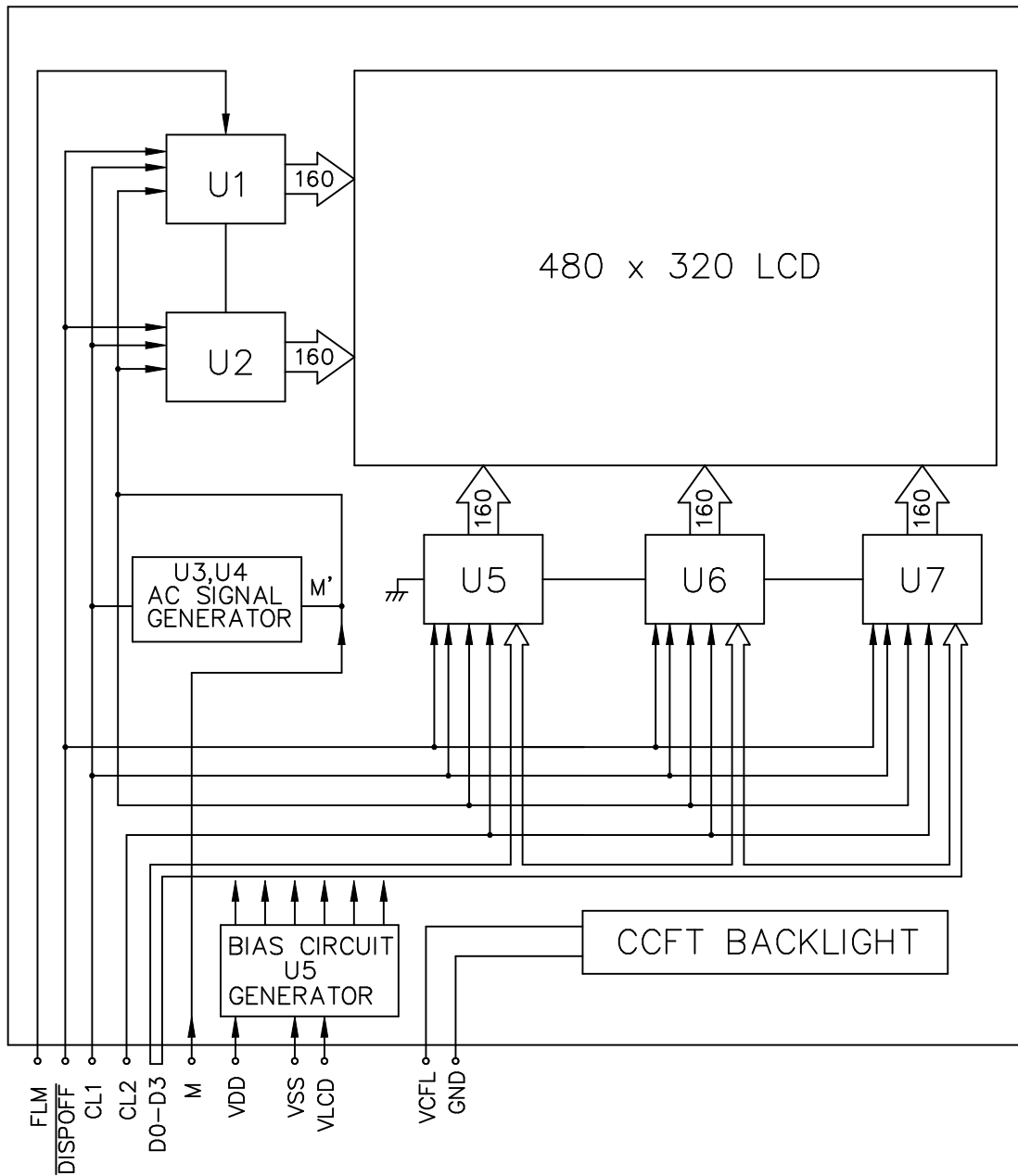
(negative type)

$$\text{Contrast Ratio : } Cr = A/B$$

\*Conditions

Viewing Angle : 0  
 Frame Frequency : 70Hz  
 Applying Waveform : 1/N duty 1/a bias

# 5. BLOCK DIAGRAM



## 6. INTERNAL PIN CONNECTION

LCM I/F :

PIN NO	SYMBOL	FUNCTION
1	CL2	DATA SHIFT
2	CL1	DATA LATCH
3	FLM	FIRST LINE MARKER
4	M	CONTROL SIGNAL FOR AC DRIVING
5	D0	DISPLAY DATA
6	D1	DISPLAY DATA
7	D2	DISPLAY DATA
8	D3	DISPLAY DATA
9	VLCD	OPERATING VOLTGE FOR LC DRIVING
10	VDD	POWER SUPPLY FOR LOGIC
11	VSS	GND
12	DISP OFF	H: ON / L: OFF

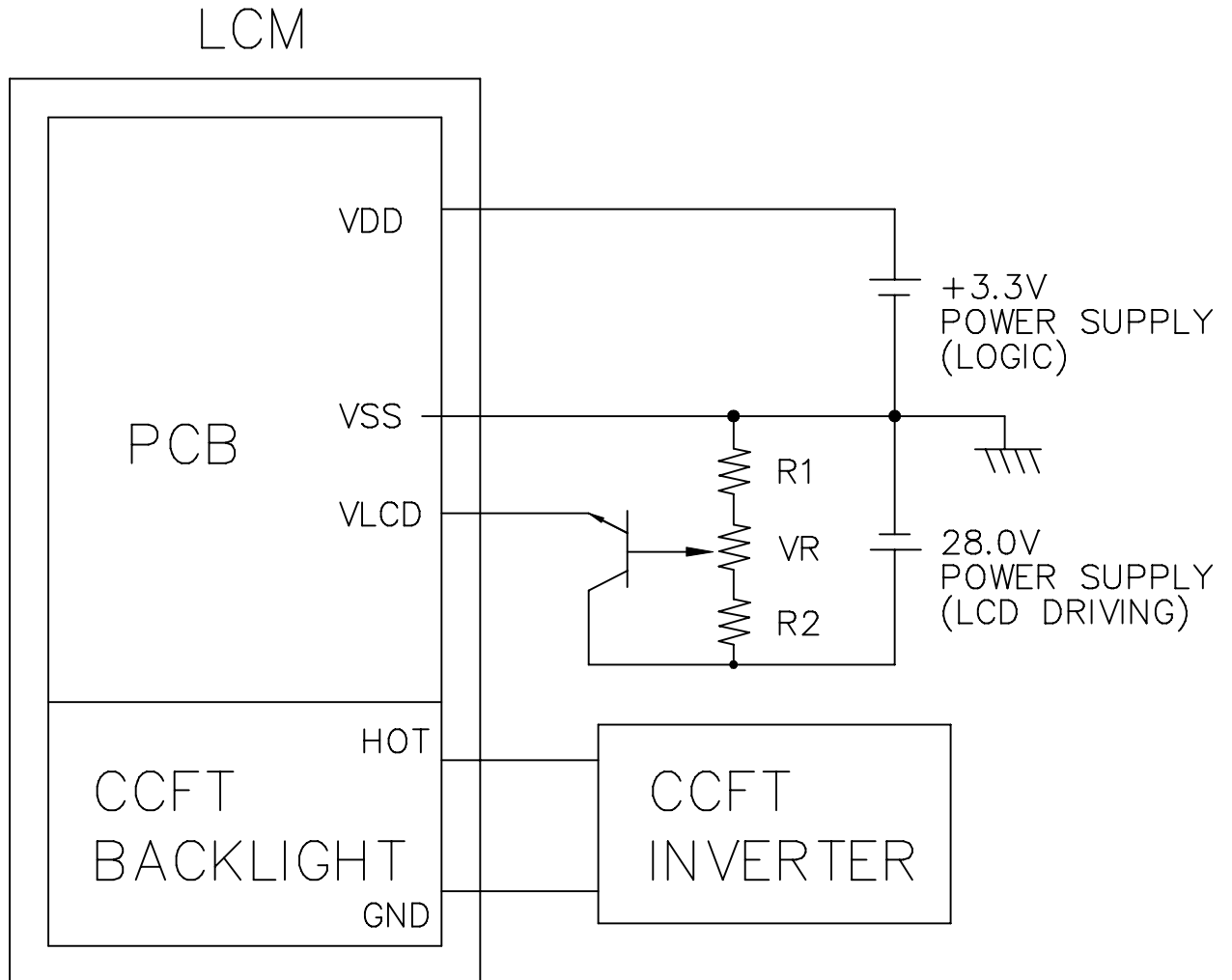
CONNECTOR : MOLEX 52271-1290 or Compatible  
(SUITABLE FPC: Pitch 1.0 mm,12pin, 0.3t)

CFL I/F : JST PHR-4

PIN NO	SYMBOL	FUNCTION
1	VCFL	Power Supply for CFL
2	N.C	—
3	N.C	—
4	GND	GND for CFL

SUITABLE CONNECTION : JST JS/1125-04  
JST B4B-PH-A

## 7. POWER SUPPLY



1.  $R1 + VR + R2 = 10K \sim 20K \Omega$

2. RECOMMENDED CCFT INVERTER :

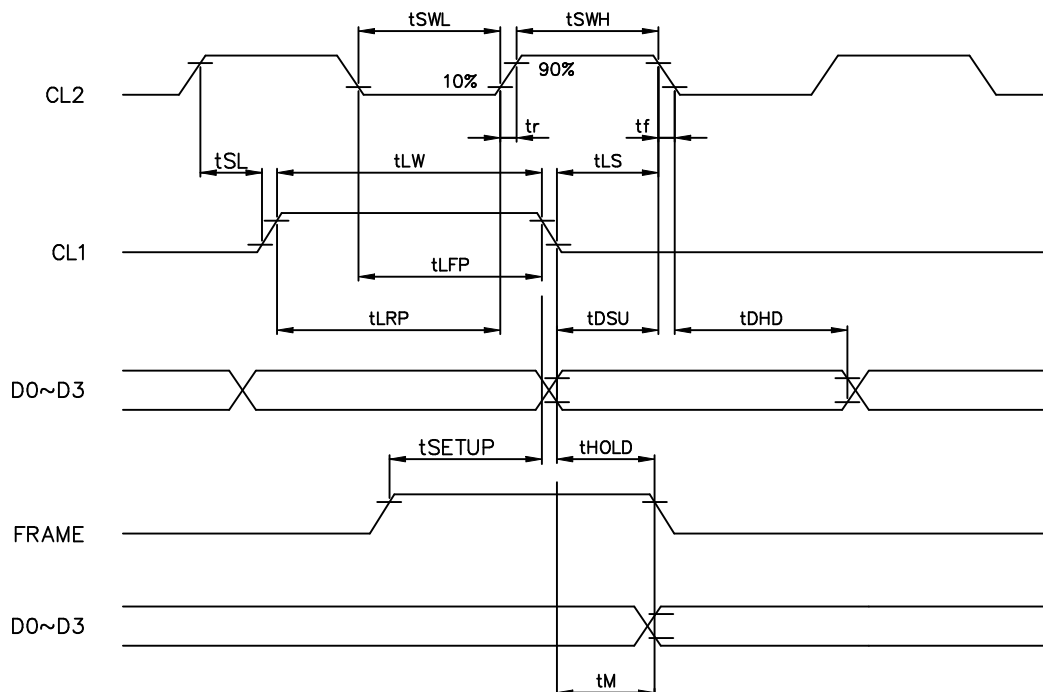
01-B523-0005(COTEK) or CXA-M10L-L(TDK)

# 8. TIMING CHARACTERISTICS

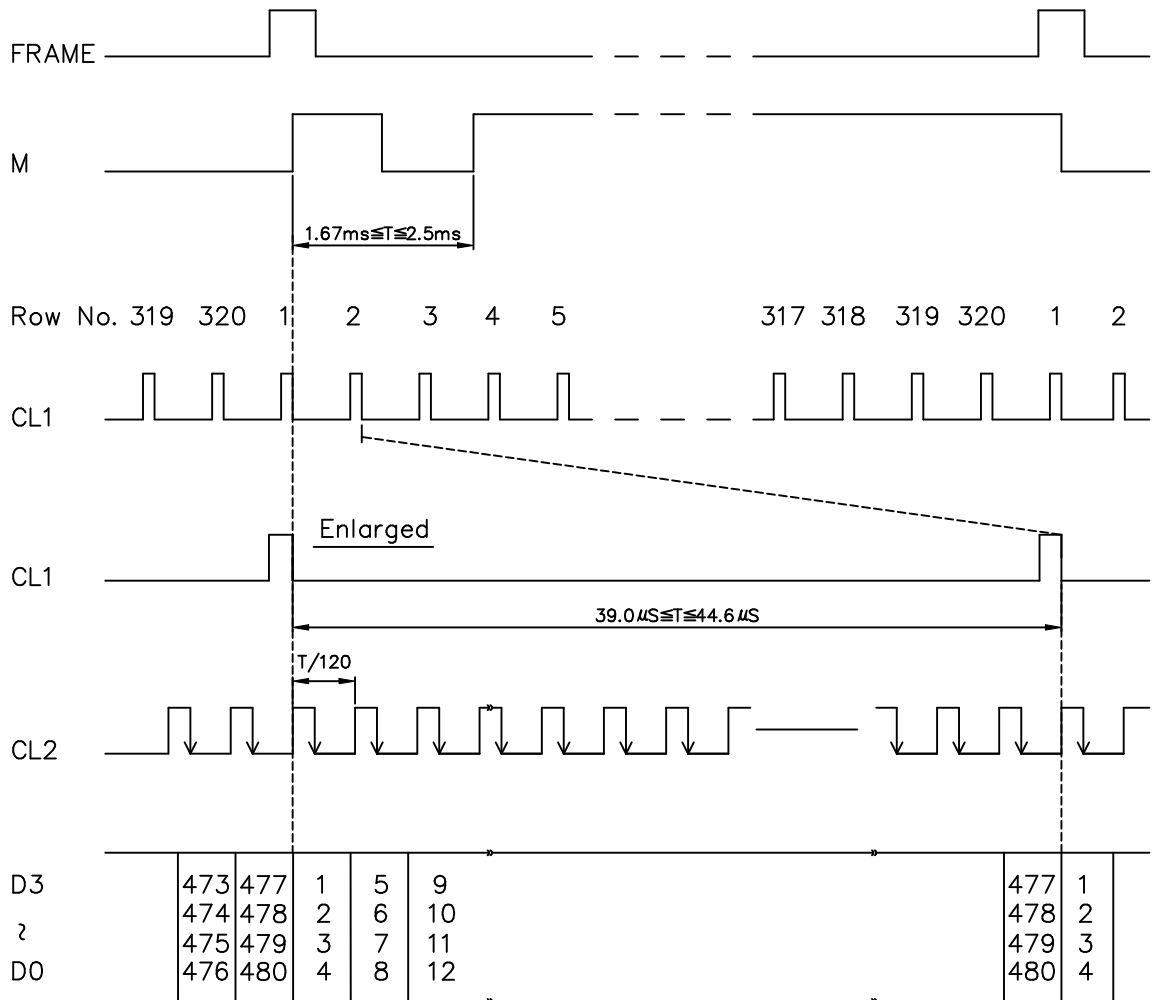
## 8-1. INTERFACE TIMING

VDD=2.7~3.45V

Item	Symbol	Min.	Typ.	Max.	Unit
Clock Frequency	tCP	-	-	10.0	MHz
CL2 Pulse Width	tSWH,tSWL	37	-	-	ns
Data Set Up Time	tDSU	35	-	-	ns
Data Hold Time	tDHD	35	-	-	ns
CL2 Rise/Fall Time	tr,tf	-	-	50	ns
CL1 Rise Time	tLRP	100	-	-	ns
CL1 Fall Time	tLFP	100	-	-	ns
CL1 Pulse Width	tLW	50	-	-	ns
CL2 To CL1 Delay Time	tSL	40	-	-	ns
CL1 To SCP Delay Time	tLS	40	-	-	ns
"FRAME" Set up Time	tSETUP	100	-	-	ns
"FRAME" Hold Time	tHOLD	30	-	-	ns
"M" Set up Time	tM	-	-	300	ns



### 8-2.TIMING CHART OF INPUT SIGNALS



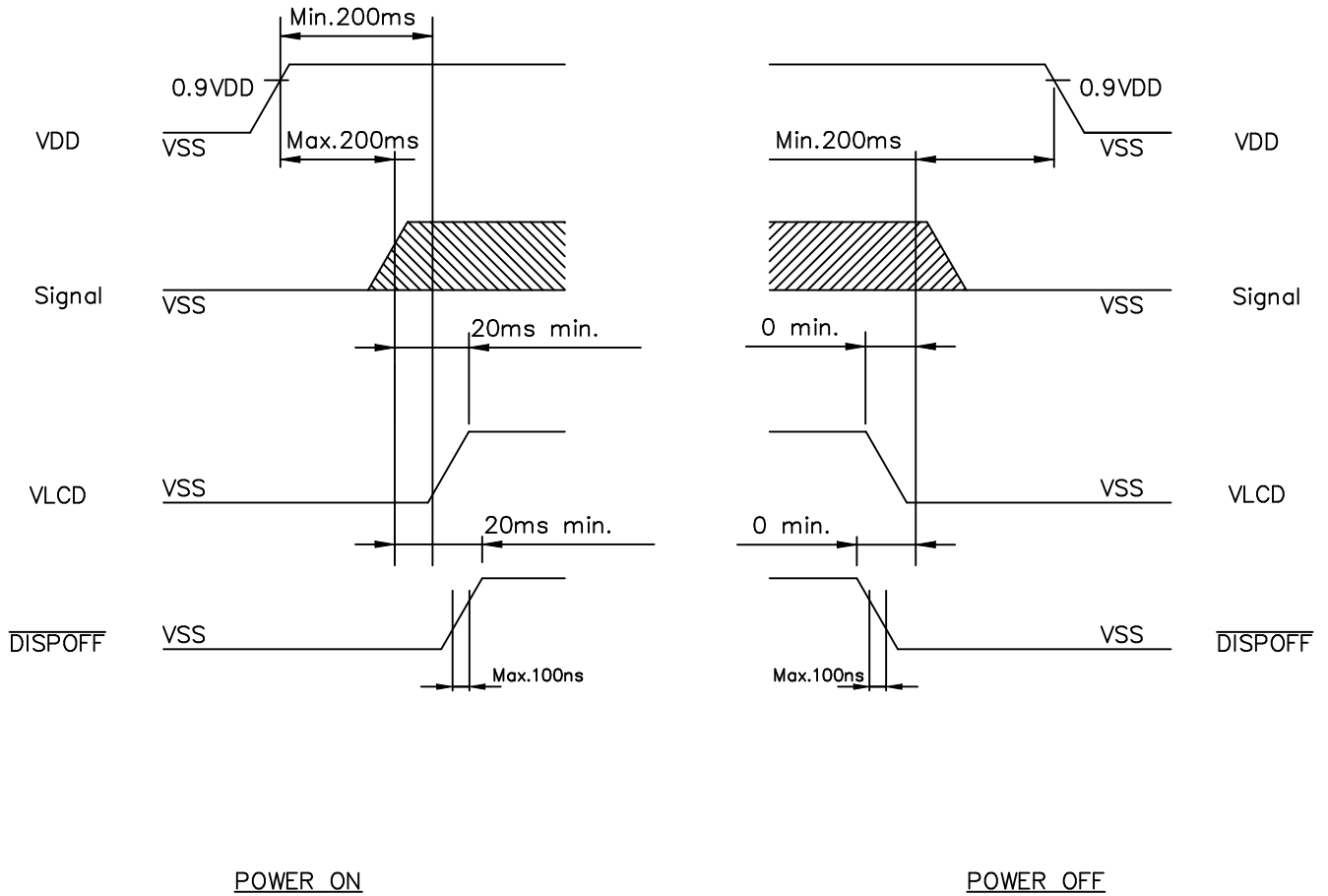
### 8-3.DISPLAY PATTERN

#001	D3	D2	D1	D0	D3		D0	D3	D2	D1	D0
#002	D3	D2	D1	D0	D3		D0	D3	D2	D1	D0
<p>Data Input:          Terninal : Dots (Row) on Display</p> <p>D0 : dot 4, dot 8 ..... dot 476, dot 480          D1 : dot 3, dot 7 ..... dot 475, dot 479          D2 : dot 2, dot 6 ..... dot 474, dot 478          D3 : dot 1, dot 5 ..... dot 473, dot 477</p>											
#319	D3	D2	D1	D0	D3		D0	D3	D2	D1	D0
#320	D3	D2	D1	D0	D3		D0	D3	D2	D1	D0
	d1	d2	d3	d4	d5		d476	d477	d478	d479	d480

320 dots

480 dots

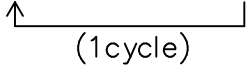
### 8-4. POWER ON/OFF TIMING



The missing pixels may occur when the LCM is driven beyond above power interface timing sequence.

## 9. RELIABILITY TEST

### NORMAL TEMPERATURE RELIABILITY TEST

NO	ITEM	CONDITION			STANDARD	NOTE
1	High Temp. Storage	70°C	120Hrs		Appearance without defect	
2	Low Temp. Storage	-20°C	120Hrs		Appearance without defect	
3	High Temp. & High Humi. Storage	50°C 90%RH	120Hrs		Appearance without defect	
4	High Temp. Operating Display	50°C	120Hrs		Appearance without defect	
5	Low Temp. Operating Display	0°C	120Hrs		Appearance without defect	
6	Thermal Shock	-20°C, 30min → 70°C, 30min  (1cycle)			Appearance without defect	10 cycles

Inspection Provision

1. Purpose

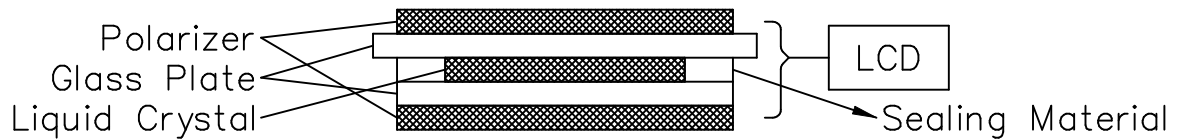
The NAN YA inspection provision provides outgoing inspection provision and its expected quality level based on our outgoing inspection of NAN YA LCD produces.

2. Applicable Scope

The NAN YA inspection provision is applicable to the arrangement in regard to outgoing inspection and quality assurance after outgoing.

3. Technical Terms

3-1 NAN YA Technical Terms



4. Outgoing Inspection

4-1 Inspection Method

MIL-STD-105E Level II Regular inspection

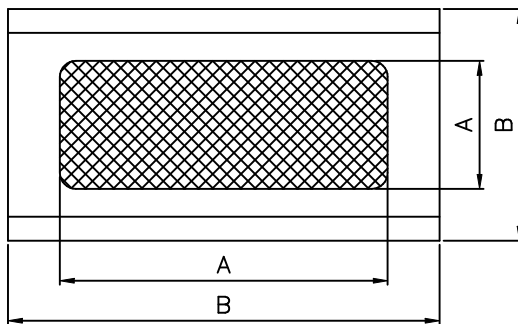
4-2 Inspection Standard

	Item		AQL(%)	Remarks
Major Defect	Dots	Opens Shorts Erroneous operation	0.4	faults which substantially lower the practicality and the initial purpose difficult to achieve.
	Solder appearance	Shorts Loose		
	Cracks	Display surface cracks		

	Dimensions	External from Dimensions	0.4	
Minor Defect	Inside the glass	Black spots	0.65	faults which appear to pose almost no obstacle to the practicality, effective use, and operation.
	Polarizing plate	Scratches, foreign Matter, air bubbles, and peeling		
	Dots	Pinhole, deformation		
	Color tone	Color unevenness		
	Solder appearance	Cold solder Solder projections		

4-3 Inspection Provisions  
\*Viewing Area Definition

Fig. 1



A : Zone Viewing Area  
B : Zone Glass Plate Outline

\*Inspection place to be 500 to 1000 lux illuminance uniformly without glaring.  
The distance between luminous source(daylight fluorescent lamp and cool white fluorescent lamp) and sample to be 30cm to 50cm.

\*Test and measurement are performed under the following conditions, unless otherwise specified.

Temperature             $20 \pm 15^{\circ}\text{C}$   
Humidity                 $65 \pm 20\% \text{R.H.}$   
Pressure                 $860 \sim 1060 \text{hPa}(\text{mmbar})$

In case of doubtful judgment, it is performed under the following conditions.

Temperature             $20 \pm 2^{\circ}\text{C}$   
Humidity                 $65 \pm 5\% \text{R.H.}$   
Pressure                 $860 \sim 1060 \text{hPa}(\text{mmbar})$

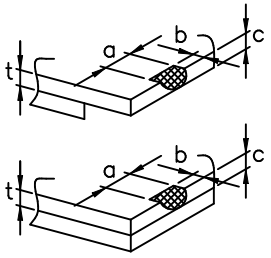
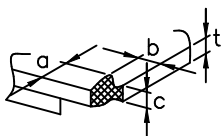
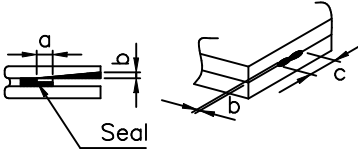
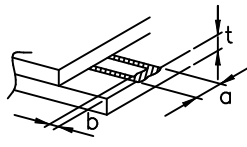
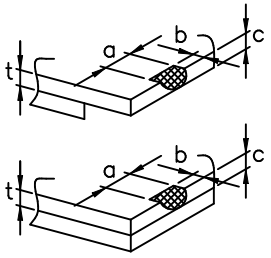
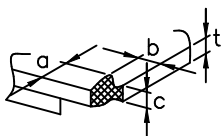
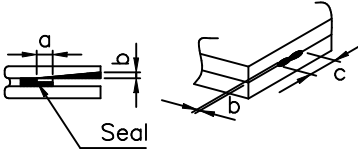
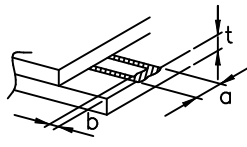
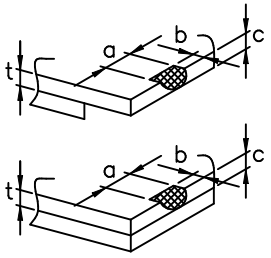
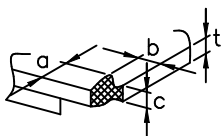
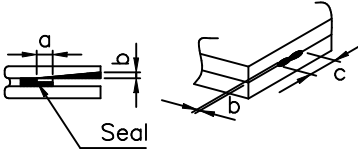
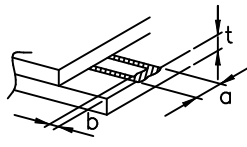
5. Specification for quality check  
5-1 Electrical characteristics

NO.	Item	Criterion
1	Non operational	Fail
2	Miss operating	Fail
3	Missing dot	Fail
4	Contrast irregular	Fail
5	Response time	Within Specified value
6	Backlight turn on/off	Within Specified value

5-2 External Appearance Defect

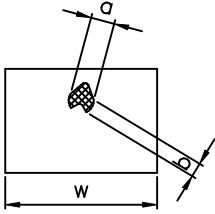
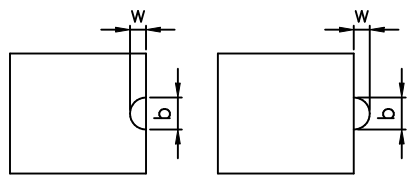
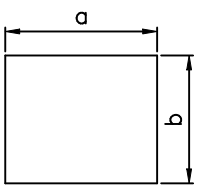
NO.	Item	Criterion																		
1	Black spots, foreign matter, and white spots (Including light leakage due to pinholes of polarizing plates, etc.)	<p>(1)-1-Spots</p> <table border="1" data-bbox="711 477 1356 763"> <thead> <tr> <th>Average Diameter(mm):D</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td><math>D \leq 0.1</math></td> <td>Ignore</td> </tr> <tr> <td><math>0.1 &lt; D \leq 0.2</math></td> <td>5</td> </tr> <tr> <td><math>0.2 &lt; D \leq 0.3</math></td> <td>2</td> </tr> <tr> <td><math>0.3 &lt; D</math></td> <td>0</td> </tr> </tbody> </table> <p>Number of total pieces is set to within 5 pieces.</p> <p>Note that when there are 2 pieces or more, they are not to be concentrated.            Set as: Average diameter = (Long diameter + Short diameter)/2</p> <p>(1)-2-Blurred Spots(At lighting condition)</p> <table border="1" data-bbox="711 1187 1356 1426"> <thead> <tr> <th>Average Diameter(mm):D</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td><math>D \leq 0.3</math></td> <td>Ignore</td> </tr> <tr> <td><math>0.3 &lt; D \leq 0.75</math></td> <td>5</td> </tr> <tr> <td><math>0.75 &lt; D</math></td> <td>0</td> </tr> </tbody> </table> <p>Number of total pieces is set to within 5 pieces.</p> <p>Note that when there are 2 pieces or more, they are not to be concentrated.            Set as: Average diameter = (Long diameter + Short diameter)/2</p>	Average Diameter(mm):D	Number of pieces permitted	$D \leq 0.1$	Ignore	$0.1 < D \leq 0.2$	5	$0.2 < D \leq 0.3$	2	$0.3 < D$	0	Average Diameter(mm):D	Number of pieces permitted	$D \leq 0.3$	Ignore	$0.3 < D \leq 0.75$	5	$0.75 < D$	0
Average Diameter(mm):D	Number of pieces permitted																			
$D \leq 0.1$	Ignore																			
$0.1 < D \leq 0.2$	5																			
$0.2 < D \leq 0.3$	2																			
$0.3 < D$	0																			
Average Diameter(mm):D	Number of pieces permitted																			
$D \leq 0.3$	Ignore																			
$0.3 < D \leq 0.75$	5																			
$0.75 < D$	0																			

1	Line	<p>(1)-1-Lines</p> <table border="1" data-bbox="711 427 1453 712"> <thead> <tr> <th>Width(mm): W</th> <th>Length(mm): L</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td><math>W \leq 0.03</math></td> <td>Ignore</td> <td>Ignore</td> </tr> <tr> <td><math>0.03 &lt; W \leq 0.08</math></td> <td><math>L \leq 4</math></td> <td>2</td> </tr> <tr> <td><math>0.08 &lt; W \leq 0.1</math></td> <td><math>L \leq 1</math></td> <td>1</td> </tr> </tbody> </table> <p>Object exceeding 0.1mm follow the standards of the spots form. Note that when there are 2 pieces or more, they are not to be concentrated.</p> <p>(1)-2-Blurred Lines(At lighting condition)</p> <table border="1" data-bbox="711 1016 1453 1301"> <thead> <tr> <th>Width(mm): W</th> <th>Length(mm): L</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td><math>W \leq 0.03</math></td> <td>Ignore</td> <td>Ignore</td> </tr> <tr> <td><math>0.03 &lt; W \leq 0.08</math></td> <td><math>L \leq 3</math></td> <td>6</td> </tr> <tr> <td><math>0.08 &lt; W</math></td> <td><math>3 &lt; L</math></td> <td>None</td> </tr> </tbody> </table> <p>Object exceeding 0.1mm follow the standards of the spots form. Note that when there are 2 pieces or more, they are not to be concentrated.</p>	Width(mm): W	Length(mm): L	Number of pieces permitted	$W \leq 0.03$	Ignore	Ignore	$0.03 < W \leq 0.08$	$L \leq 4$	2	$0.08 < W \leq 0.1$	$L \leq 1$	1	Width(mm): W	Length(mm): L	Number of pieces permitted	$W \leq 0.03$	Ignore	Ignore	$0.03 < W \leq 0.08$	$L \leq 3$	6	$0.08 < W$	$3 < L$	None
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$0.03 < W \leq 0.08$	$L \leq 3$	6																								
$0.08 < W$	$3 < L$	None																								
2	Scratches(Glass, reflection plates, and polarizing plates)	In accordance with black spots. (At non lighting condition)																								
3	Color irregular	Not remarkable color irregular.																								

<p>4 Air bubbles polarizing plates, and reflection plates</p>	<table border="1" data-bbox="710 380 1225 672"> <tr> <th data-bbox="710 380 970 526">Average Diameter (mm):D</th> <th data-bbox="970 380 1225 526">Number of pieces permitted</th> <th data-bbox="1225 380 1473 672" rowspan="2">Average diameter = (Long diameter + Short diameter)/2</th> </tr> <tr> <td data-bbox="710 526 970 672">D ≤ 0.3 0.3 &lt; D</td> <td data-bbox="970 526 1225 672">Ignore 0</td> </tr> </table> <p data-bbox="710 683 1473 779">Note that when there are 4 pieces or more, they are not to be concentrated.</p>		Average Diameter (mm):D	Number of pieces permitted	Average diameter = (Long diameter + Short diameter)/2	D ≤ 0.3 0.3 < D	Ignore 0						
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D ≤ 0.3 0.3 < D	Ignore 0												
<p>5 Cracks</p>	<table border="1" data-bbox="662 779 1473 1964"> <tr> <td data-bbox="662 779 1066 1171"> <p>(1)General crack</p>  </td> <td data-bbox="1066 779 1473 1171"> <p><math>a \leq 5</math> <math>b \leq 2</math> <math>c \leq t</math></p> <p>Where, a and b are ignored when less than or equal to 0.5. The numbers of pieces are set at up to 5 pieces.</p> </td> </tr> <tr> <td data-bbox="662 1171 1066 1361"> <p>(2)Corner crack</p>  </td> <td data-bbox="1066 1171 1473 1361"> <p><math>a \leq 2.5</math> <math>b \leq 2.5</math> <math>c \leq t</math> <math>a+b \leq 4</math></p> </td> </tr> <tr> <td data-bbox="662 1361 1066 1635"> <p>(3)Seal portion crack</p>  </td> <td data-bbox="1066 1361 1473 1635"> <p><math>a \leq \text{The seal width} \times 1/3</math> <math>b \leq t \times 2/3</math> <math>c \leq 5</math></p> <p>The numbers of pieces are set at up to 5 pieces.</p> </td> </tr> <tr> <td data-bbox="662 1635 1066 1870"> <p>(4)ITO Pin crack</p>  </td> <td data-bbox="1066 1635 1473 1870"> <p><math>a \leq 5</math> <math>b \leq 1/3 \text{ pin length}</math> <math>c \leq t</math></p> </td> </tr> <tr> <td data-bbox="662 1870 1066 1964"> <p>(5)Progressive cracks</p> </td> <td colspan="2" data-bbox="1066 1870 1473 1964"> <p>All taken to be unacceptable.</p> </td> </tr> </table>		<p>(1)General crack</p> 	<p><math>a \leq 5</math> <math>b \leq 2</math> <math>c \leq t</math></p> <p>Where, a and b are ignored when less than or equal to 0.5. The numbers of pieces are set at up to 5 pieces.</p>	<p>(2)Corner crack</p> 	<p><math>a \leq 2.5</math> <math>b \leq 2.5</math> <math>c \leq t</math> <math>a+b \leq 4</math></p>	<p>(3)Seal portion crack</p> 	<p><math>a \leq \text{The seal width} \times 1/3</math> <math>b \leq t \times 2/3</math> <math>c \leq 5</math></p> <p>The numbers of pieces are set at up to 5 pieces.</p>	<p>(4)ITO Pin crack</p> 	<p><math>a \leq 5</math> <math>b \leq 1/3 \text{ pin length}</math> <math>c \leq t</math></p>	<p>(5)Progressive cracks</p>	<p>All taken to be unacceptable.</p>	
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6	Outer dimensions	Should be within the tolerance.
7	Newton ring(touch panel)	Orbicular of interference fringes is not allowed in the optimum contrast within the active area under viewing angle.
8	Soldering	Should be no defective soldering such as shorting, loose terminal cold solder, peeling of printed circuit board pattern, improper mounting position, etc.

5-3 Dot Appearance Defect

NO.	Item	Criteria
1	Pinhole	 <p>Dot display a and b are each <math>\leq 0.2\text{mm}</math> The overall total is taken be with in 10 units. Note that they are not to be concentrated.</p>
2	Missing	 <p>Dot display a and b are each <math>\leq 0.2\text{mm}</math> The overall total is taken to be with in 10 units.</p>
3	Thick and thin display	 <p>Taken to be within <math>\pm 1.5\%</math> of display character width(a) and height(b).</p>

NOTICE:

• SAFETY

- 1.If the LCD panel breaks, be careful not to get the liquid crystal to touch your skin.
- 2.If the liquid crystal touches your skin or clothes, please wash it off immediately by using soap and water.

• HANDLING

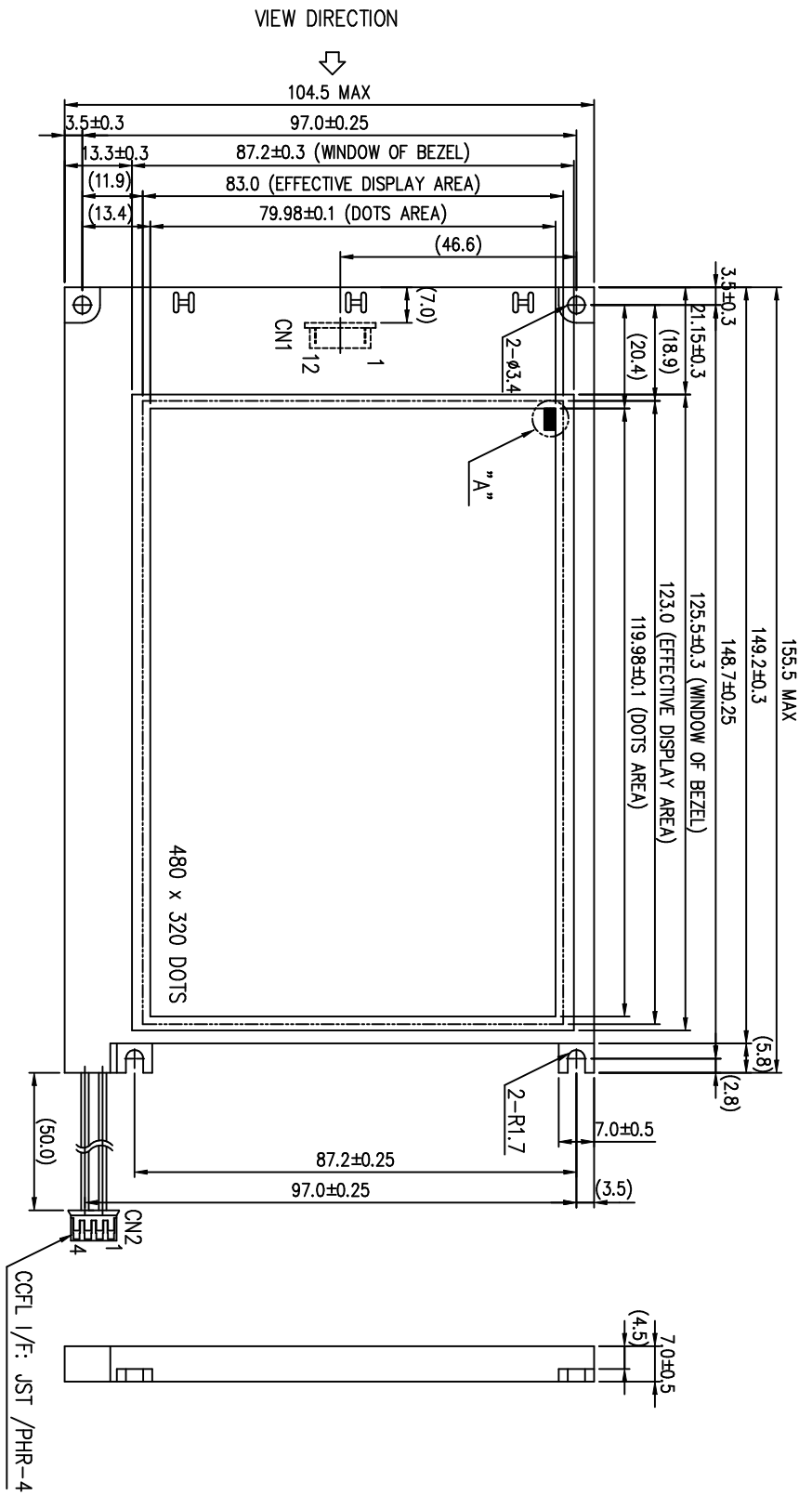
- 1.Avoid static electricity which can damage the CMOS LSI.
- 2.Do not remove the panel or frame from the module.
- 3.The polarizing plate of the display is very fragile. So, please handle it very carefully.
- 4.Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
- 5.Do not use ketonics solvent & Aromatic solvent. Use a soft cloth soaked with a cleaning naphtha solvent.

• STORAGE

- 1.Store the panel or module in a dark place where the temperature is  $25^{\circ}\text{C}\pm 5^{\circ}\text{C}$  and the humidity is below 65% RH.
- 2.Do not place the module near organics solvents or corrosive gases.
- 3.Do not crush, shake, or jolt the module.

• TERMS OF WARRANT

- 1.Acceptance inspection period  
The period is within one month after the arrival of contracted commodity at the buyer's factory site.
- 2.Applicable warrant period  
The period is within twelve months since the date of shipping out under normal using and storage conditions.



VIEW DIRECTION

104.5 MAX

97.0±0.25

3.5±0.3

13.3±0.3

(11.9)

(13.4)

87.2±0.3 (WINDOW OF BEZEL)

83.0 (EFFECTIVE DISPLAY AREA)

79.98±0.1 (DOTS AREA)

(46.6)

(7.0)



2-φ3.4

"A"

3.4±0.3

21.15±0.3

(18.9)

(20.4)

149.2±0.3

148.7±0.25

155.5 MAX

125.5±0.3 (WINDOW OF BEZEL)

123.0 (EFFECTIVE DISPLAY AREA)

119.98±0.1 (DOTS AREA)

(5.8)

(2.8)

7.0±0.5

(3.5)

87.2±0.25

97.0±0.25

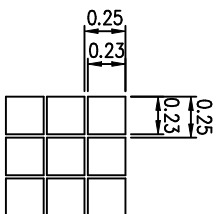
(50.0)

CN2

CCFL I/F: JST /PHR-4

(4.5)

7.0±0.5



A DETAIL  
S = 30:1

CN2 CCFL I/F: JST /PHR-4

PIN NOSYMBOL	FUNCTION
1	VCFL Power Supply for CCFL
2	N/C
3	N/C
4	GND GND for CCFL

- NOTES :
1. RESOLUTION : 480 x 320 DOTS
  2. GLASS THICKNESS : 0.7 mm
  3. BACKLIGHT : CCFL

GENERAL TOLERANCE LIST

DIMENSION	TOLERANCE
L ≤ 6	±0.25 (mm)
6 < L ≤ 18	±0.3 (mm)
18 < L ≤ 50	±0.4 (mm)
50 < L ≤ 125	±0.5 (mm)
125 < L	±0.6 (mm)

南亞塑膠工業股份有限公司  
NAN YA PLASTICS CORPORATION  
製 品 圖

LTBFAN582P1XCS\_

CN1 LCM I/F : MOLEX 52271-1290 or COMPATIBLE(FPC: Pitch 1.0 mm,12pin, 0.3t)

PIN NOSYMBOL	FUNCTION	PIN NOSYMBOL	FUNCTION
1	CL2 DATA SHIFT	7	D2 DISPLAY DATA
2	CL1 DATA LATCH	8	D3 DISPLAY DATA
3	FLM FIRST LINE MARKER	9	VLCD OPERATING VOLTGE FOR LC DRIVING
4	M CONTROL SIGNAL FOR AC DRIVING	10	VDD POWER SUPPLY FOR LOGIC
5	DO DISPLAY DATA	11	VSS GND
6	D1 DISPLAY DATA	12	DISP OFF H: ON / L: OFF

REV. NO.	DESCRIPTION	DATE	DESIGN	CHECK	APPROVE

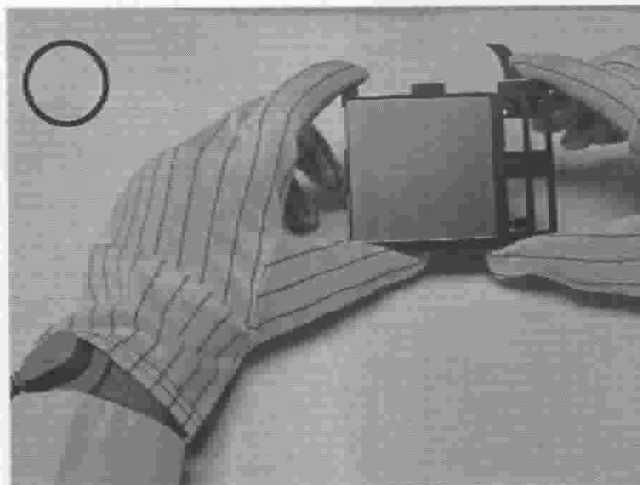
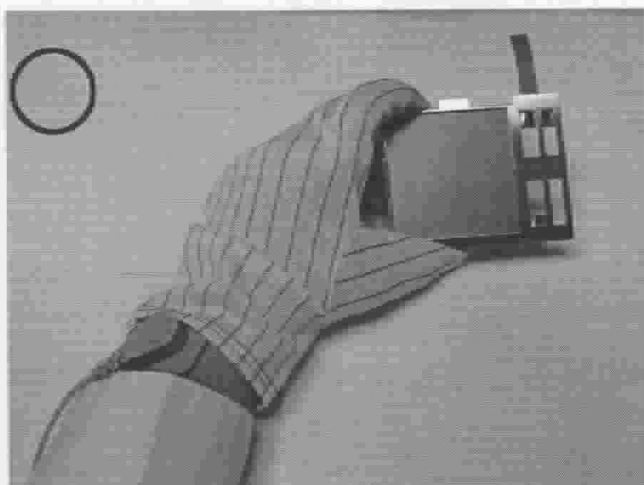
DWG NO.	NAME	DATE	THIRD ANGLE P.
M1582BD1A			

# THE NOTES OF LCM USING

LCM is easy to damage.

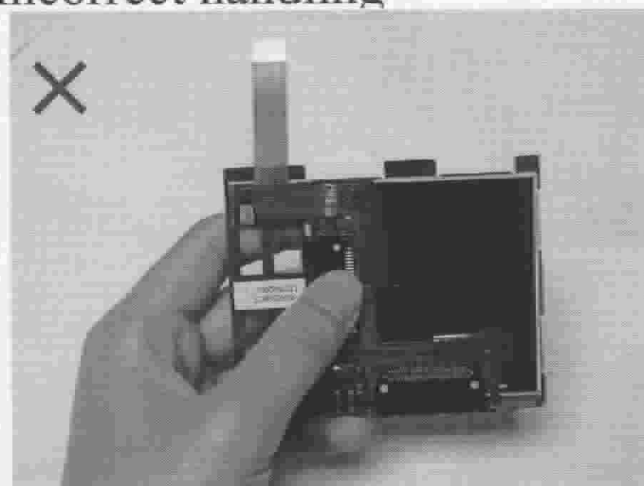
Please follow the notes as bellows, and be careful of handling!

## Correct handling

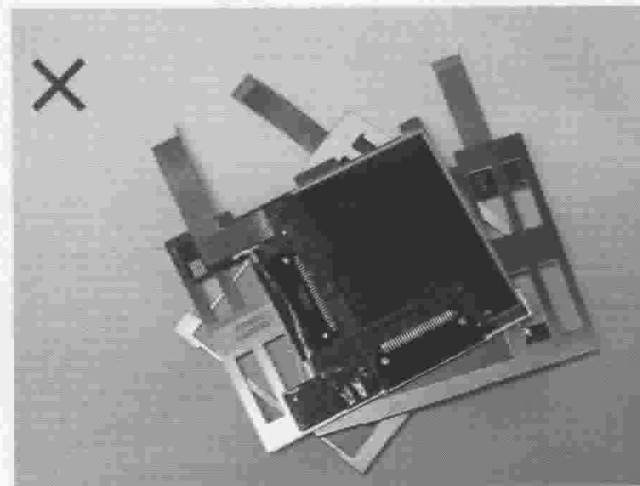


As above picture, please handle with glove by LCM edges and full EOS/ESD protection.

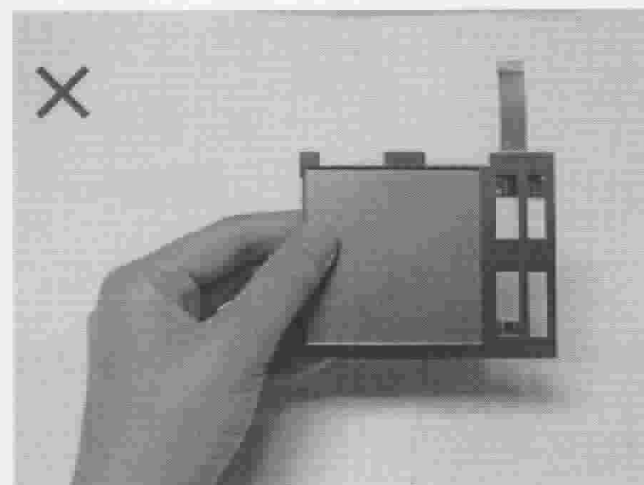
## Incorrect handling



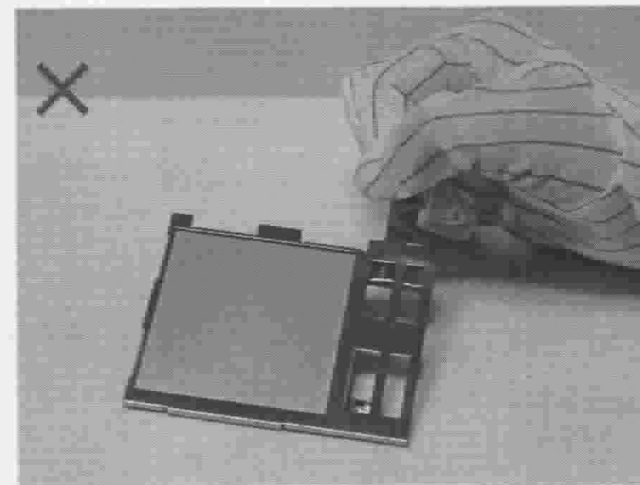
Please don't touch IC directly.



Please don't put one on another LCM.



Please don't hold the surface of LCM.



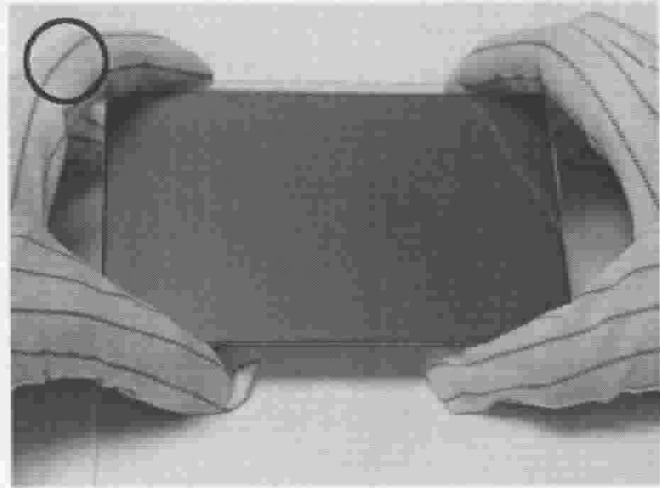
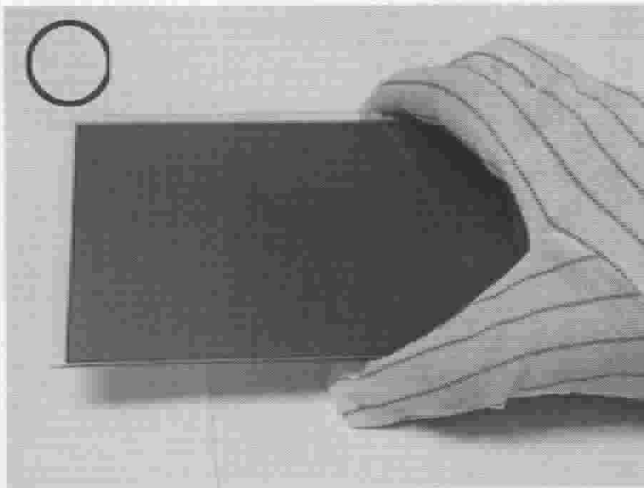
Please don't stretch interface of output.

# THE NOTES OF LCD USING

LCD is easy damage.

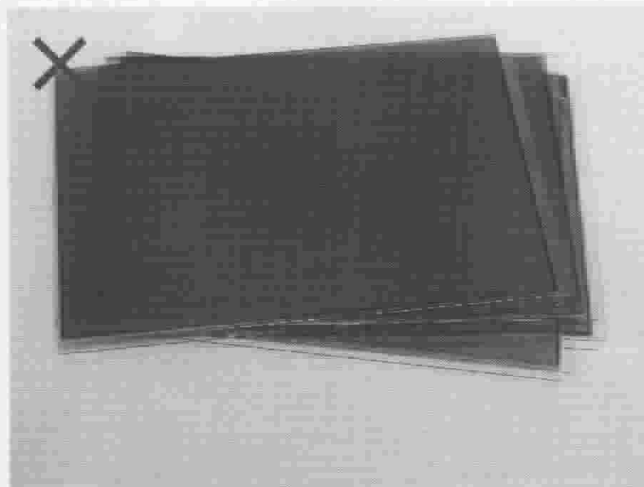
Please follow notes as bellows, and be careful of handling!

## Correct handling

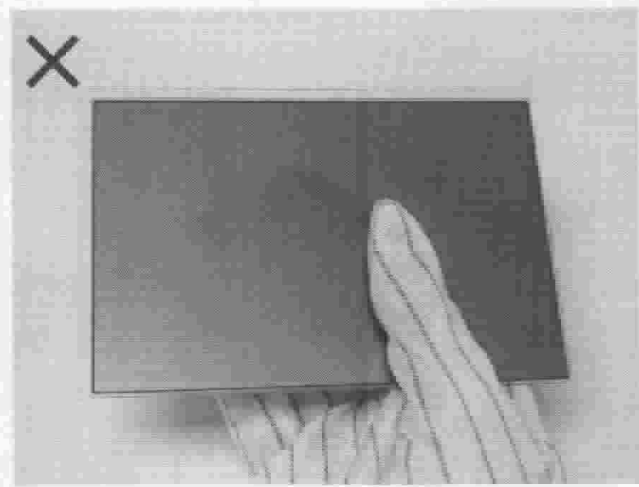


As above picture, please handle with glove by LCD edges and full EOS/ESD protection.

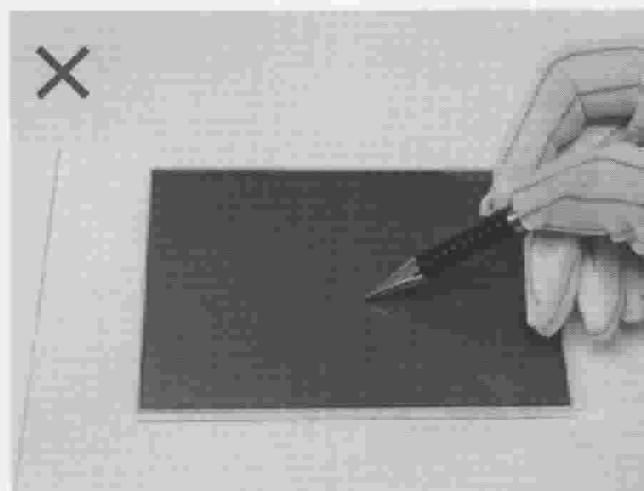
## Incorrect handling



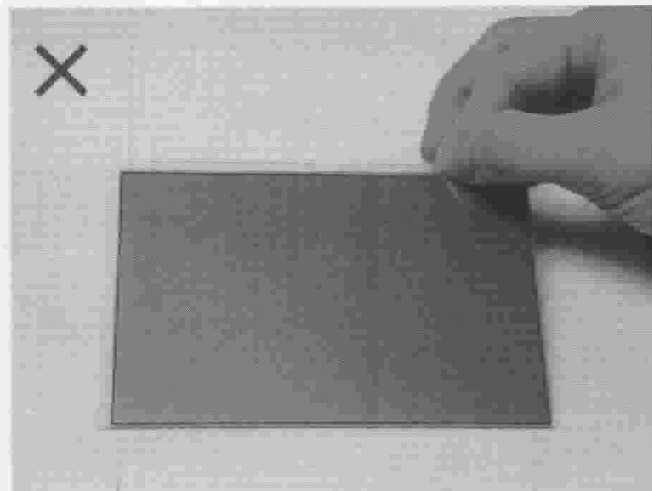
Please don't put one on another LCD.



Please don't hold the surface of LCD.



Please don't operate with sharp stick such as sharp pencil.



Please don't touch ITO glass without anti-static gloves.

