

NAN YA PLASTICS CORPORATION

SPECIFICATION OF
LCD MODULE
PRODUCT NO.: LT_E9_372__

SPEC. NO.: LM372-0- 

CUSTOMER
APPROVED BY
DATE:

LCD DEPARTMENT
ELECTRONIC MATERIALS DIVISION
NAN YA PLASTICS CORPORATION
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EDITED ON : JUN.20, 2002

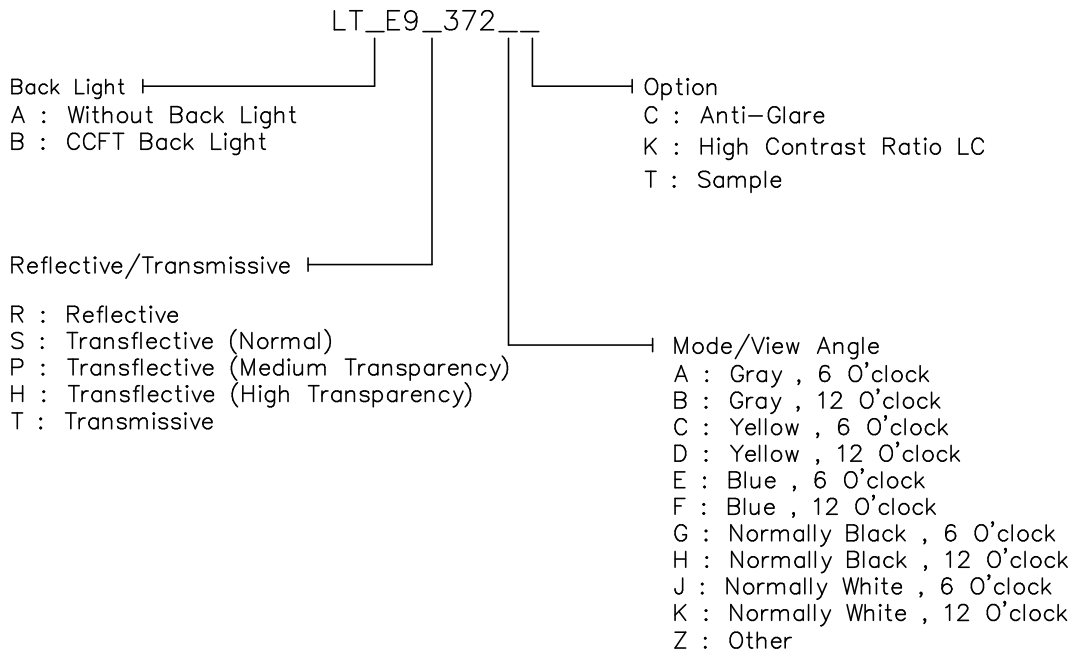
DESIGN MANAGER	DESIGN CHECK	DESIGNER
		J.P. Weng

NAN YA PLASTICS CORP. ELEC. MATERIALS DIV. LCD DEPARTMENT	SPECIFICATION	SPEC. NO. : LM372-0 DATE : Apr. 15, 2000 SHEET NO. : 1/23
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1. MECHANICAL DATA

- | | |
|------------------------------|---|
| (1) Product No. | LT_E9_372__ |
| (2) Module Size | 142.6 (W)mm x 92.6 (H)mm x MAX 7.5 (D)mm |
| (3) Dot Size | 0.285 (W)mm x 0.285 (H)mm |
| (4) Dot Pitch | 0.30 (W)mm x 0.30 (H)mm |
| (5) Number of Dots | 320 (W) x 240 (H)Dots |
| (6) Duty | 1/240 |
| (7) LCD Display Mode | STN: <input type="checkbox"/> Gray Mode <input type="checkbox"/> Yellow Mode <input type="checkbox"/> Blue Mode
<input type="checkbox"/> Other Mode
FSTN: <input type="checkbox"/> Black and White(Normal White/Positive Image)
<input type="checkbox"/> Black and White(Normal Black/Negative Image)
Rear Polarizer: <input type="checkbox"/> Transflective(Normal) <input type="checkbox"/> Transmissive
<input type="checkbox"/> Transflective(Medium Transparency)
<input type="checkbox"/> Transflective(High Transparency)
<input type="checkbox"/> Reflective |
| (8) Viewing Direction | <input type="checkbox"/> 6 O'clock <input type="checkbox"/> 12 O'clock <input type="checkbox"/> ____O'clock |
| (9) Backlight | <input type="checkbox"/> CCFT <input type="checkbox"/> W/O B.L |
| (10) Recommended FL Inverter | TDK CORP. CXA-L10L For CCFT |
| (11) Weight | 120 g (approx.) |

Note :



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NAN YA PLASTICS CORP. ELEC. MATERIALS DIV. LCD DEPARTMENT	SPECIFICATION	SPEC. NO. : LM372-0 DATE : Apr. 15, 2000 SHEET NO. : 2/23
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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	6.5	V	
Power Supply for LCM	VDD-VEE	0	27.0	V	
Input Voltage	VI	-0.3	VDD+0.3	V	
Static Electricity	-	-	-	-	Note 1

Note 1 LCM should be grounded during handling LCM.

(2) ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE	
	MIN.	MAX.	MIN.	MAX.
Ambient Temperature	-20	70	-30	80
Humidity(Without Condensation)	Note 2, 4		Note 3, 4	

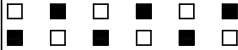
Note 2 Ta ≤ 70°C : 75%RH max
 Ta > 70°C : Absolute humidity must be lower
 than the humidity of 75%RH at 70°C

Note 3 Ta at -30°C will be < 48hrs, at 80°C will be < 120hrs

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

REV/DATE	R0/ 4.15.2000'								BY SEAN HU
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3. ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
Power Supply for Logic	VDD-VSS	-	4.5	5.0	5.5	V	
			2.7	3.0	3.3		
Recommended LC Driving Voltage	VDD-VEE	Duty=1/240 Bias=1/13	-20°C	24.3	24.7	25.1	V
			0°C	23.0	23.4	23.8	
			25°C	22.2	22.6	23.0	
			50°C	20.9	21.3	21.7	
			70°C	20.3	20.7	21.1	
Input Voltage	VIH	H level	0.8VDD	-	VDD	V	
	VIL	L level	0	-	0.2VDD	V	
Power Supply Current	IDD	FLM = 70 Hz VDD = 5.0 V VDD-VEE = 22.6 V	-	6.4	9	mA	
	IEE	PATTERN : 	-	6.0	9	mA	
CCFL LAMP	Starting Voltage	Vs	-	420	1000	Vrms	
	Lamp Voltage	VL	-	280	-	Vrms	
	Lamp Current	IL	4	5	6	mArms	
	Lamp Consumption	PL	-	1.4	-	W	
	Lamp Frequency	FL	-	35	-	KHz	
	Lamp Life Time	LL	-	20000	-	hrs	
LCM	Surface Luminance	L(ALL ON)	Transmissive/Black	-	191	-	cd/m ²
		L(ALL OFF)		-	8.3	-	cd/m
		L(ALL ON)	Transflective/Normally white	-	23	-	cd/m
		L(ALL OFF)		-	97	-	cd/m
		L(ALL ON)	Transflective/BLUE	-	36	-	cd/m
		L(ALL OFF)		-	195	-	cd/m

REV/DATE	R0/ 4.15.2000'	R1/ 5.06.2000'						BY SEAN HU
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4. OPTICAL CHARACTERISTICS

AT V_{OP}

ITEM MODE		Cr(Contrast Ratio)										θ(Viewing Angle)		φ(Viewing Angle)	
		-20℃		0℃		25℃		50℃		70℃		25℃		25℃	
		MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.
T	G,H	-	15	-	18	-	20	-	10	-	5	-	X-60	-	54-33
S	J	-	7	-	8	-	8	-	6	-	4	-	36-36	-	33-36
T	E	-	4	-	4	-	4.5	-	3.5	-	2.5	-	X-37	-	37-27
R	J	5	7	6	8	6	8	4	6	2.5	4	-	36-33	-	35-35
Note		NOTE 6										NOTE 5			

Note:

R: REFLECTIVE

S: TRANSFLECTIVE(NORMAL)

T: TRANSMISSIVE

P: TRANSFLECTIVE(MEDIUM TRANSPARENCY)

A: GRAY

C: YELLOW

E,F: BLUE

G,H: NORMALLY BLACK

J: NORMALLY WHITE

Z: OTHER

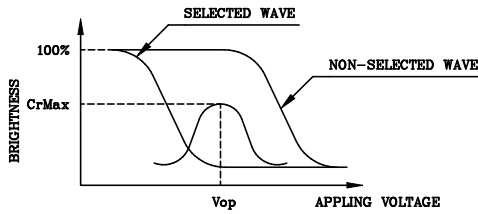
AT $\phi=0^\circ$ $\theta=0^\circ$

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Response Time (rise)	Tr	-20℃	1700	3400	5100	ms	NOTE 2
		0℃	400	800	1200		
		25℃	100	200	300		
		50℃	50	100	150		
		70℃	35	70	105		
Response Time (fall)	Tf	-20℃	1000	2000	3000	ms	NOTE 2
		0℃	180	350	520		
		25℃	60	120	180		
		50℃	35	70	105		
		70℃	25	50	75		

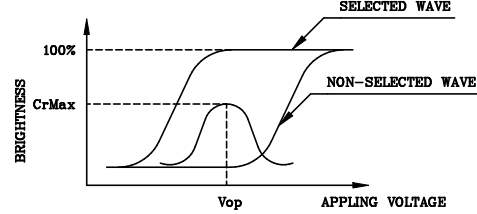
REV/DATE	R0/ 4.15.2000'	R2/ 6.20.2002'						BY J.P. Weng
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(NOTE 1)

Definition of Operation Voltage(Vop)



(positive type)



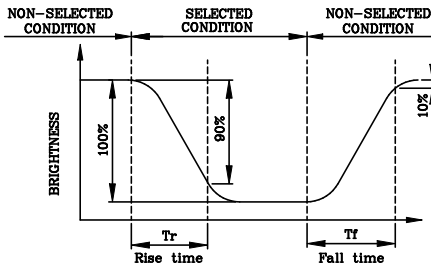
(negative type)

*Conditions

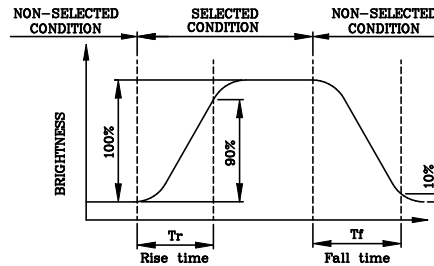
Viewing Angle : 0
Frame Frequency : 70Hz
Applying Waveform : 1/N duty 1/a bias

(NOTE 2)

Definition of Response Time(Tr,Tf)



(positive type)



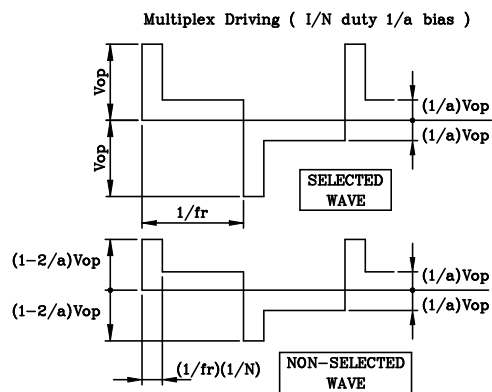
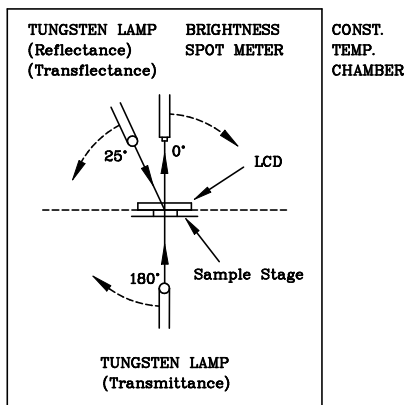
(negative type)

*Conditions

Operating Voltage : Vop
Viewing Angle (θ,φ) : (0,0)
Frame Frequency : 70Hz
Applying Waveform : 1/N duty 1/a bias

(NOTE 3)

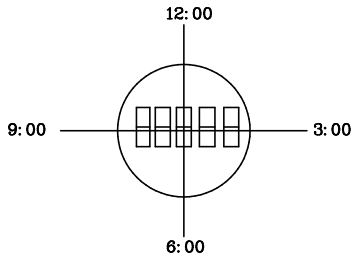
Description of Measuring Equipment and Driving Waveforms



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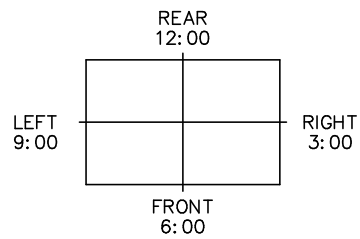
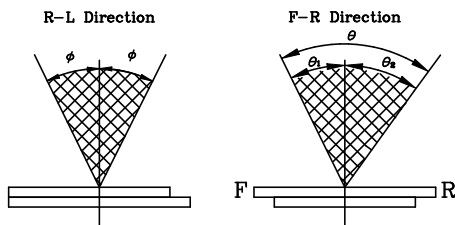
(NOTE 4)

Definition of Viewing Direction



(NOTE 5)

Definition of Viewing Angle



*For This Product
The Viewing Direction Is 6 O'clock
So $\theta_1 > \theta_2$

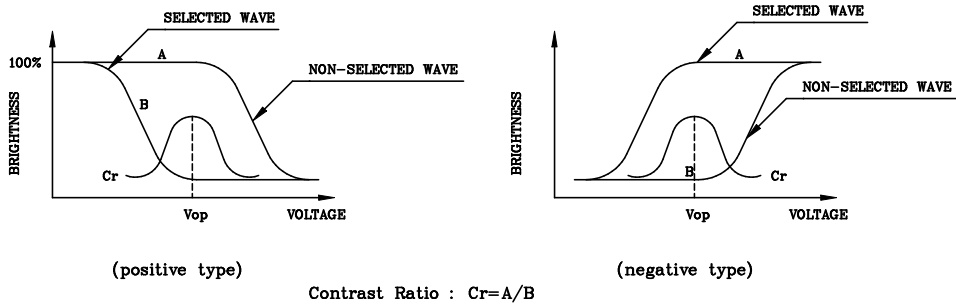
$\theta = \theta_1 + \theta_2$

*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)

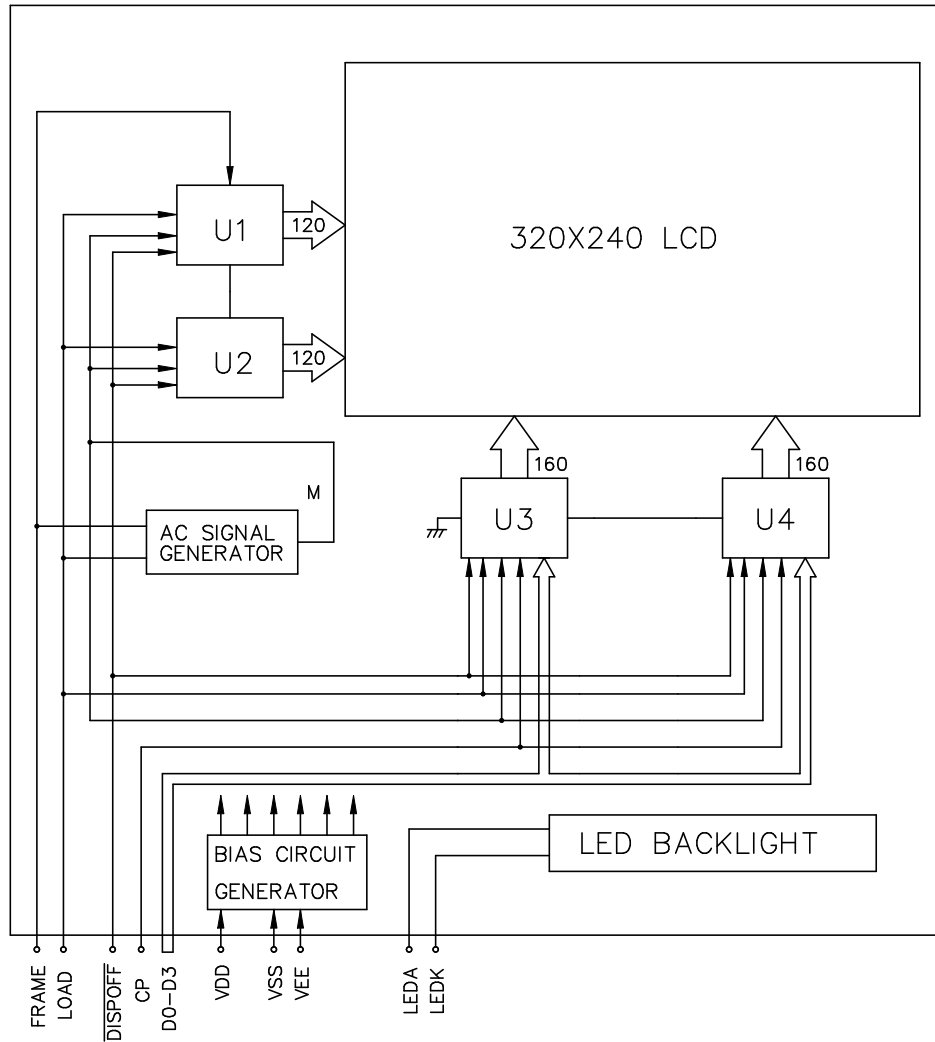


*Conditions

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

REV/DATE	R0/ 4.15.2000'							BY SEAN HU
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5. BLOCK DIAGRAM



* AC SIGNAL SETTING

J1	J2	J3	J4	J5	J6	J7	J8
H	L	L	H	H	L	L	L

REV/DATE

R0/
4.15.2000'

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6. INTERNAL PIN CONNECTION

PIN CONNECTOR : ELCO 6224-12P-S-A OR EQUIVALENT

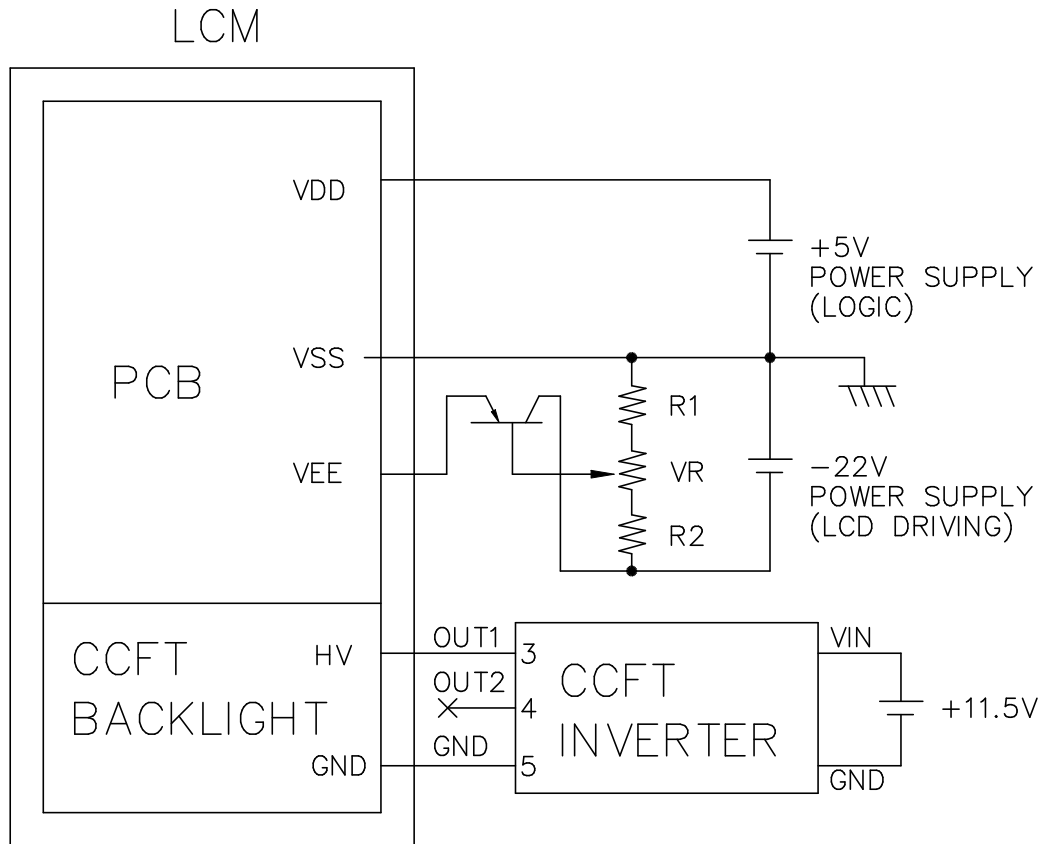
PIN NO.	SYMBOL	LEVEL	FUNCTION
1	FRAME	H	FIRST LINE MARKER
2	LOAD	H→L	DATA LATCH
3	CP	H→L	DATA SHIFT
4	VDD	-	POWER SUPPLY FOR LOGIC
5	VSS	-	GND
6	VEE	-	POWER SUPPLY FOR LC
7	D0	H/L	DISPLAY DATA
8	D1		
9	D2		
10	D3		
11	$\overline{\text{DISPOFF}}$	H/L	H: ON/L: OFF
12	NC	-	-

CCFL CONNECTOR : MITSUMI/M63M83-04 OR EQUIVALENT

PIN NO.	SYMBOL	LEVEL	FUNCTION
1	GND	-	GND FOR CCFT BACKLIGHT
2	NC	-	-
3	NC	-	-
4	HV	-	POWER SUPPLY FOR CCFT BACKLIGHT

REV/DATE	R0/ 4.15.2000'							BY SEAN HU
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7. POWER SUPPLY



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

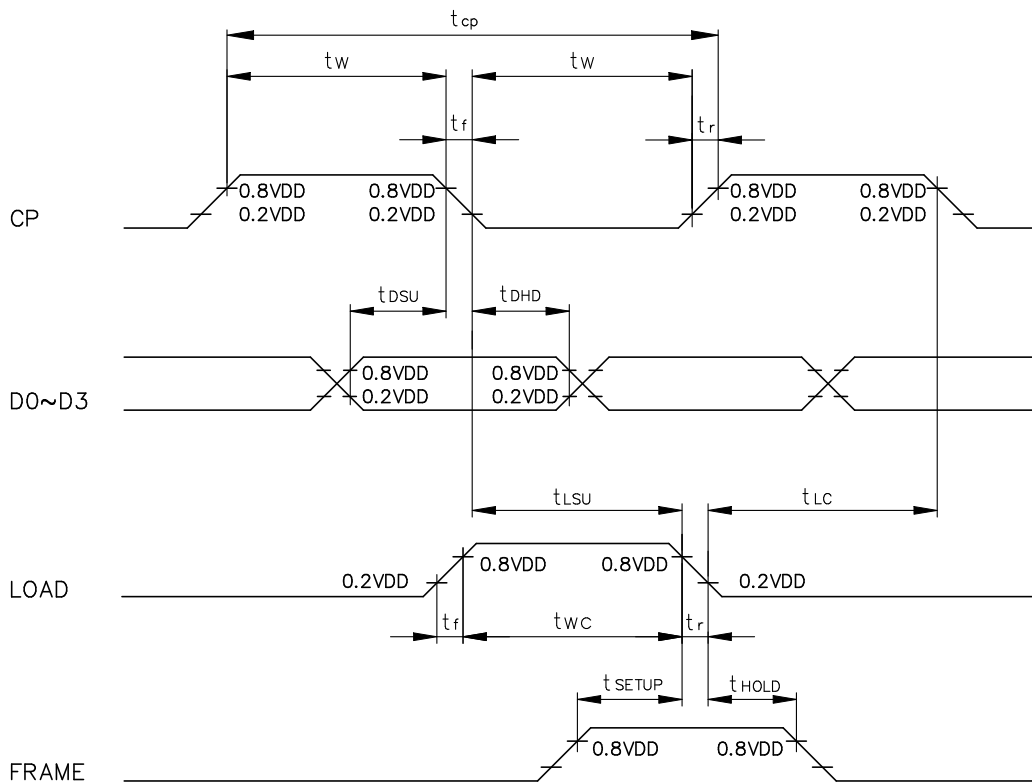
2. RECOMMENDED CCFT INVERTER : CXA-L10L(TDK)
(OPERATING TEMP. $-10^{\circ} \sim 60^{\circ}C$)

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8. TIMING CHARACTERISTICS

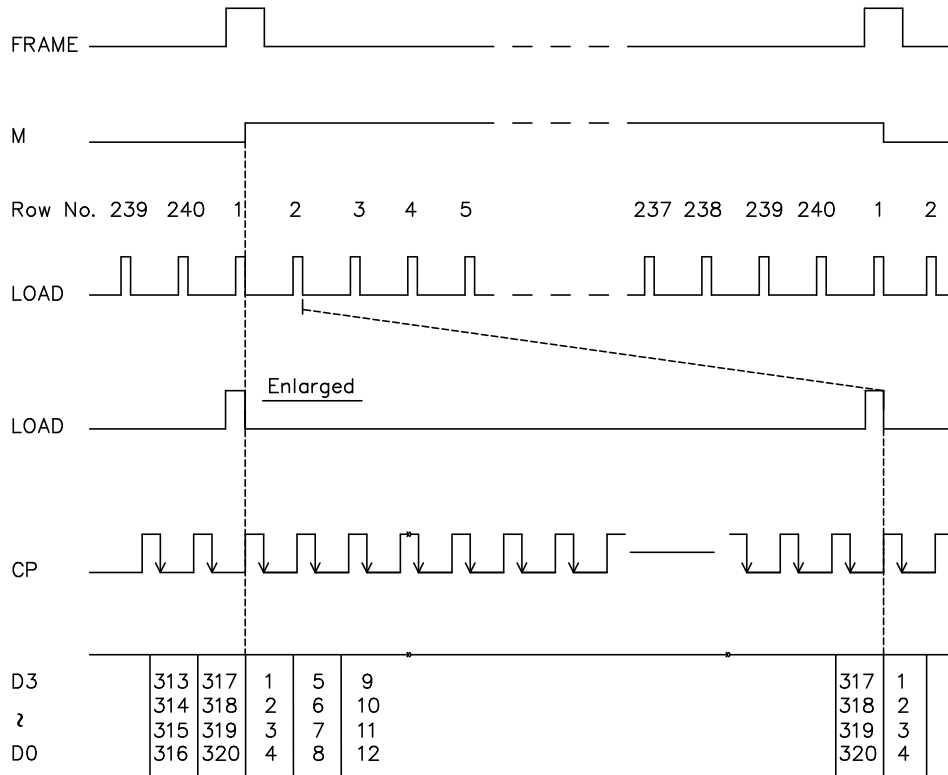
@VDD=2.5~5.5V

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Shift Clock Period	t_{cp}	220	-	-	ns
"CP" PULSE WIDTH	t_w	90	-	-	ns
CLOCK RISE, FALL TIME	t_r, t_f	-	-	20	ns
DATA SETUP TIME	t_{dsu}	80	-	-	ns
DATA HOLD TIME	t_{dhd}	65	-	-	ns
"CP" → "LOAD" FALL TIME	t_{lsu}	100	-	-	ns
"LOAD" → "CP" FALL TIME	t_{lc}	100	-	-	ns
"FRAME" SETUP TIME	t_{setup}	100	-	-	ns
"FRAME" HOLD TIME	t_{hold}	100	-	-	ns
"LOAD" PULSE WIDTH	t_{wc}	110	-	-	ns



REV/DATE	R0/ 4.15.2000'	R1/ 5.06.2000'						BY SEAN HU
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8.2 TIMING CHART OF INPUT SIGNALS

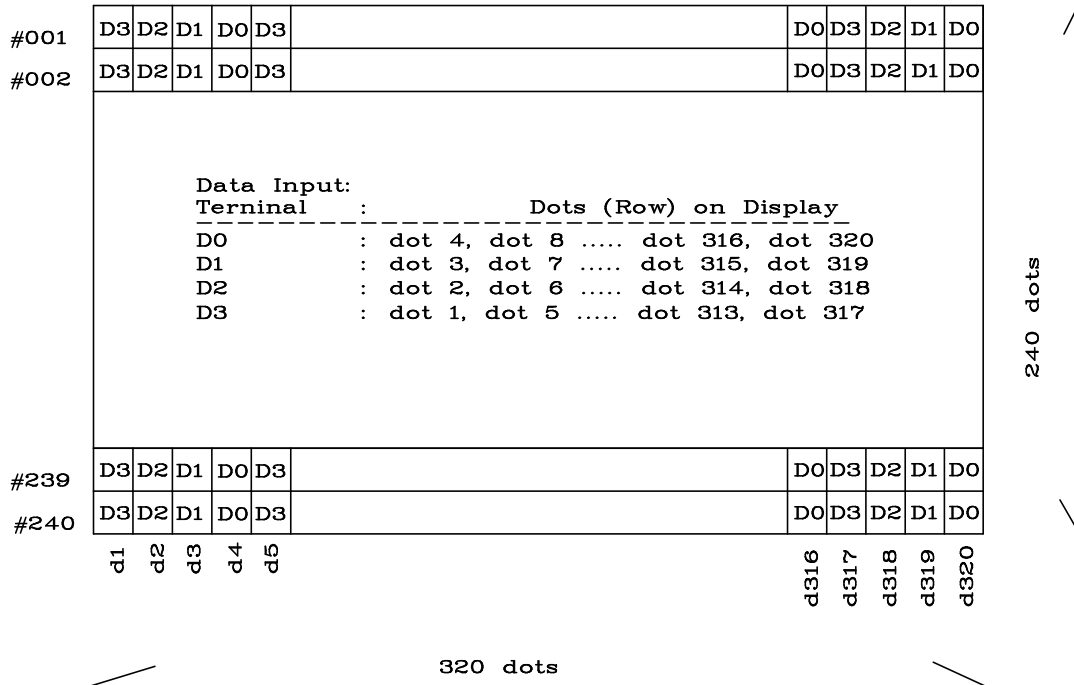


REV/DATE

R0/
4.15.2000'

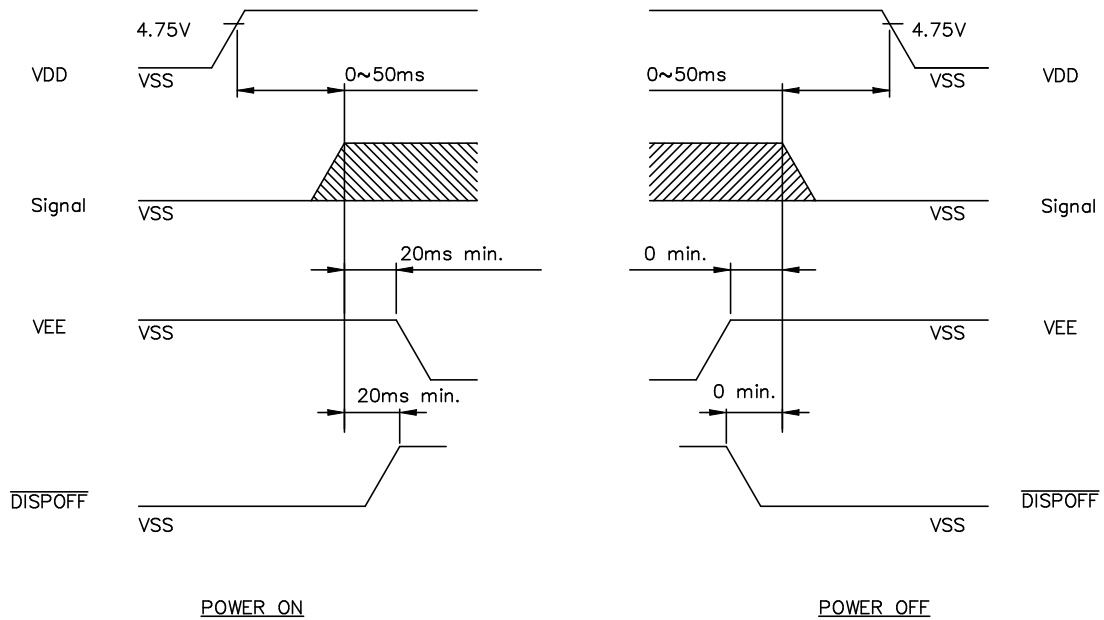
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8.3 DISPLAY PATTERN



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8.4 POWER ON/OFF TIMING



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

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9. RELIABILITY TEST

NO	ITEM	CONDITION			STANDARD	NOTE
1	High Temp. Storage	70°C	120HR		Appearance without defect	
2	Low Temp. Storage	-20°C	120HR		Appearance without defect	
3	High Temp. & High Humi. Storage	40°C 90%RH	120HR		Appearance without defect	
4	Thermal Shock	-20°C, 30min → 25°C.5min → 60°C, 30min → 25°C.5min (1cycle)			Appearance without defect	5 cycles

REV/DATE	R0/ 4.15.2000'							BY SEAN HU
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NAN YA PLASTICS CORP. ELEC. MATERIALS DIV. LCD DEPARTMENT	SPECIFICATION	SPEC. NO. : LM372-0 DATE : Apr. 15, 2000 SHEET NO. : 15/23
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Inspection Provision

1. Purpose

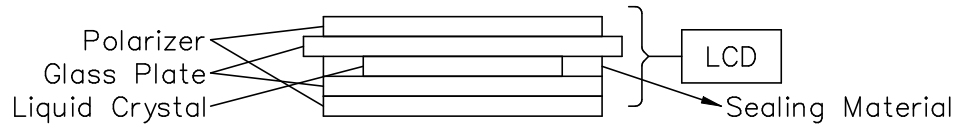
The NAN YA inspection provision provides outgoing inspection provision and its expected quality level based on our outgoing inspection of NAN YA LCD produces.

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 Provision

Outgoing inspection is according to the product inspection manual.
(Per 1-1, 1-2 & 1-3)

4-1 Inspection Method

MIL-STD-105D 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		

REV/DATE	R0/ 4.15.2000'							BY SEAN HU
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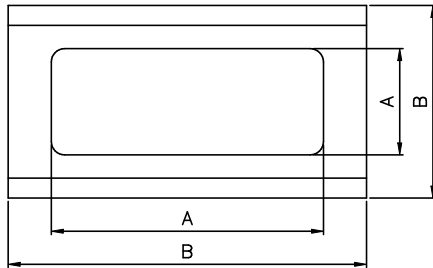
NAN YA PLASTICS CORP. ELEC. MATERIALS DIV. LCD DEPARTMENT	SPECIFICATION	SPEC. NO. : LM372-0 DATE : Apr. 15, 2000 SHEET NO. : 16/23
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	Dimensions	External from Dimensions	0.4	
Minor Defect	Inside the glass	Black spots	0.65	faults which appear to pose 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 Out Line

*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 a sample to be 30cm to 50cm.

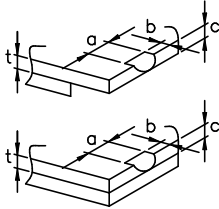
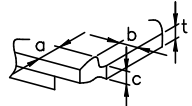
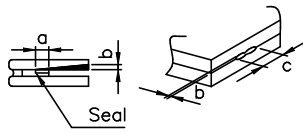
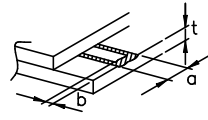
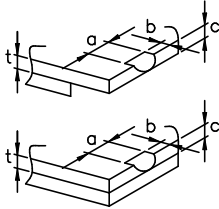
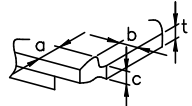
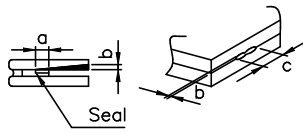
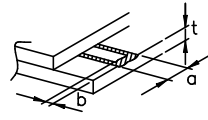
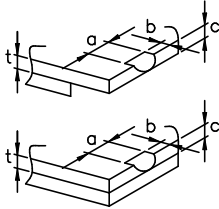
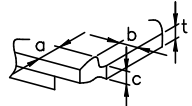
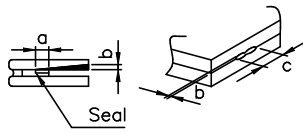
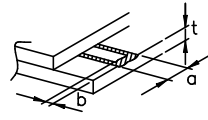
REV/DATE	R0/ 4.15.2000'							BY SEAN HU
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NAN YA PLASTICS CORP. ELEC. MATERIALS DIV. LCD DEPARTMENT		SPECIFICATION				SPEC. NO. : LM372-0 DATE : Apr. 15, 2000 SHEET NO. : 17/23																			
<p>*Test and measurement are performed under the following conditions, unless otherwise specified.</p> <p style="margin-left: 40px;">Temperature 20± 15°C Humidity 65± 20%R.H.. Pressure 860~1060hPa(mmbar)</p> <p>In case of doubtful judgment, it is performed under the following conditions.</p> <p style="margin-left: 40px;">Temperature 20± 2°C Humidity 65± 5%R.H.. Pressure 860~1060hPa(mmbar)</p> <p>5.Specification for quality check 5-1 Electrical characteristics</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>NO.</th> <th>Item</th> <th>Criterion</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Non operational</td> <td>Fail</td> </tr> <tr> <td>2.</td> <td>Miss operating</td> <td>Fail</td> </tr> <tr> <td>3.</td> <td>Missing dot</td> <td>Fail</td> </tr> <tr> <td>4.</td> <td>Contrast irregular</td> <td>Not allowable</td> </tr> <tr> <td>5.</td> <td>Response time</td> <td>Within Specified value</td> </tr> </tbody> </table>								NO.	Item	Criterion	1.	Non operational	Fail	2.	Miss operating	Fail	3.	Missing dot	Fail	4.	Contrast irregular	Not allowable	5.	Response time	Within Specified value
NO.	Item	Criterion																							
1.	Non operational	Fail																							
2.	Miss operating	Fail																							
3.	Missing dot	Fail																							
4.	Contrast irregular	Not allowable																							
5.	Response time	Within Specified value																							
REV/DATE	R0/ 4.15.2000'						BY SEAN HU																		

NAN YA PLASTICS CORP. ELEC. MATERIALS DIV. LCD DEPARTMENT		SPECIFICATION				SPEC. NO. : LM372-0 DATE : Apr. 15, 2000 SHEET NO. : 18/23																			
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(At non lighting condition)</p> <table border="1"> <thead> <tr> <th>Average Diameter(mm):D</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td>$D \leq 0.1$</td> <td>Ignore</td> </tr> <tr> <td>$0.1 < D \leq 0.2$</td> <td>5</td> </tr> <tr> <td>$0.2 < D \leq 0.3$</td> <td>2</td> </tr> <tr> <td>$0.3 < D$</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-Spots(At lighting condition)</p> <table border="1"> <thead> <tr> <th>Average Diameter(mm):D</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td>$D \leq 0.3$</td> <td>Ignore</td> </tr> <tr> <td>$0.3 < D \leq 0.75$</td> <td>5</td> </tr> <tr> <td>$0.75 < D$</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
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REV/DATE	R0/ 4.15.2000'						BY SEAN HU																		

NAN YA PLASTICS CORP. ELEC. MATERIALS DIV. LCD DEPARTMENT		SPECIFICATION				SPEC. NO. : LM372-0 DATE : Apr. 15, 2000 SHEET NO. : 19/23	
1. Black spots, foreign matter, and white spots (Including light leakage due to pinholes of polarizing plates, etc.)		(1)-1 Spots(At non lighting condition)					
		Width(mm): W		Length(mm): L		Number of pieces permitted	
		W ≤ 0.03		Ignore		Ignore	
		0.03 < W ≤ 0.08		L ≤ 4		2	
		0.08 < W ≤ 0.1		L ≤ 1		1	
		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.					
		(1)-2 Spots(At lighting condition)					
		Width(mm): W		Length(mm): L		Number of pieces permitted	
		W ≤ 0.03		Ignore		Ignore	
		0.03 < W ≤ 0.08		L ≤ 3		6	
		0.08 < W		3 < L		None	
		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.					
2. Scratches(Glass, reflection plates, and polarizing plates)		In accordance with black spots. (At non lighting condition)					
3. Color irregular		Not remarkable color irregular.					
REV/DATE	R0/ 4.15.2000'						BY SEAN HU

SPECIFICATION

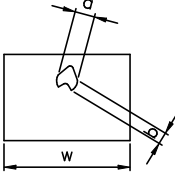
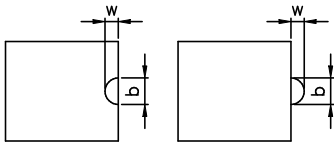
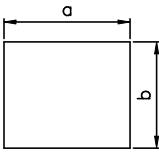
4.	Air bubbles polarizing plates, and reflection plates	<table border="1"> <tr> <td data-bbox="740 432 954 551">Average Diameter (mm):D</td> <td data-bbox="954 432 1161 551">Number of pieces permitted</td> <td data-bbox="1161 432 1361 674" rowspan="2">Average diameter = (Long diameter + Short diameter)/2</td> </tr> <tr> <td data-bbox="740 551 954 669">D ≤ 0.3 0.3 < D</td> <td data-bbox="954 551 1161 669">Ignore 0</td> </tr> </table> <p data-bbox="740 685 1337 752">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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5.	Cracks	<table border="1"> <tr> <td data-bbox="699 763 1034 1088"> <p data-bbox="703 770 943 801">(1)General crack</p>  </td> <td data-bbox="1034 763 1361 1088"> <p data-bbox="1038 770 1098 801">$a \leq 5$</p> <p data-bbox="1038 808 1098 840">$b \leq 2$</p> <p data-bbox="1038 846 1098 878">$c \leq t$</p> <p data-bbox="1038 884 1353 1088">Where, a and b are ignored when less than or equal 0.5. The numbers of pieces are set at up to 5 pieces.</p> </td> </tr> <tr> <td data-bbox="699 1088 1034 1245"> <p data-bbox="703 1095 935 1126">(2)Corner crack</p>  </td> <td data-bbox="1034 1088 1361 1245"> <p data-bbox="1038 1095 1123 1126">$a \leq 2.5$</p> <p data-bbox="1038 1133 1123 1164">$b \leq 2.5$</p> <p data-bbox="1038 1171 1098 1202">$c \leq t$</p> <p data-bbox="1038 1209 1139 1240">$a+b \leq 4$</p> </td> </tr> <tr> <td data-bbox="699 1245 1034 1469"> <p data-bbox="703 1252 1015 1283">(3)Seal portion crack</p>  </td> <td data-bbox="1034 1245 1361 1469"> <p data-bbox="1038 1252 1353 1283">$a \leq$ The seal width $\times 1/3$</p> <p data-bbox="1038 1290 1161 1321">$b \leq t \times 2/3$</p> <p data-bbox="1038 1328 1098 1359">$c \leq 5$</p> <p data-bbox="1038 1366 1353 1469">The numbers of pieces are set at up to 5 pieces.</p> </td> </tr> <tr> <td data-bbox="699 1469 1034 1671"> <p data-bbox="703 1476 948 1507">(4)ITO Pin crack</p>  </td> <td data-bbox="1034 1469 1361 1671"> <p data-bbox="1038 1476 1098 1507">$a \leq 5$</p> <p data-bbox="1038 1514 1294 1545">$b \leq 1/3$ pin length</p> <p data-bbox="1038 1552 1098 1583">$c \leq t$</p> </td> </tr> <tr> <td data-bbox="699 1671 1034 1744"> <p data-bbox="703 1677 911 1744">(5)Progressive cracks</p> </td> <td data-bbox="1034 1671 1361 1744"> <p data-bbox="1038 1677 1270 1744">All taken to be unacceptable.</p> </td> </tr> </table>	<p data-bbox="703 770 943 801">(1)General crack</p> 	<p data-bbox="1038 770 1098 801">$a \leq 5$</p> <p data-bbox="1038 808 1098 840">$b \leq 2$</p> <p data-bbox="1038 846 1098 878">$c \leq t$</p> <p data-bbox="1038 884 1353 1088">Where, a and b are ignored when less than or equal 0.5. The numbers of pieces are set at up to 5 pieces.</p>	<p data-bbox="703 1095 935 1126">(2)Corner crack</p> 	<p data-bbox="1038 1095 1123 1126">$a \leq 2.5$</p> <p data-bbox="1038 1133 1123 1164">$b \leq 2.5$</p> <p data-bbox="1038 1171 1098 1202">$c \leq t$</p> <p data-bbox="1038 1209 1139 1240">$a+b \leq 4$</p>	<p data-bbox="703 1252 1015 1283">(3)Seal portion crack</p> 	<p data-bbox="1038 1252 1353 1283">$a \leq$ The seal width $\times 1/3$</p> <p data-bbox="1038 1290 1161 1321">$b \leq t \times 2/3$</p> <p data-bbox="1038 1328 1098 1359">$c \leq 5$</p> <p data-bbox="1038 1366 1353 1469">The numbers of pieces are set at up to 5 pieces.</p>	<p data-bbox="703 1476 948 1507">(4)ITO Pin crack</p> 	<p data-bbox="1038 1476 1098 1507">$a \leq 5$</p> <p data-bbox="1038 1514 1294 1545">$b \leq 1/3$ pin length</p> <p data-bbox="1038 1552 1098 1583">$c \leq t$</p>	<p data-bbox="703 1677 911 1744">(5)Progressive cracks</p>	<p data-bbox="1038 1677 1270 1744">All taken to be unacceptable.</p>
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REV/DATE	R0/ 4.15.2000'							BY SEAN HU
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NAN YA PLASTICS CORP. ELEC. MATERIALS DIV. LCD DEPARTMENT	SPECIFICATION	SPEC. NO. : LM372-0 DATE : Apr. 15, 2000 SHEET NO. : 21/23
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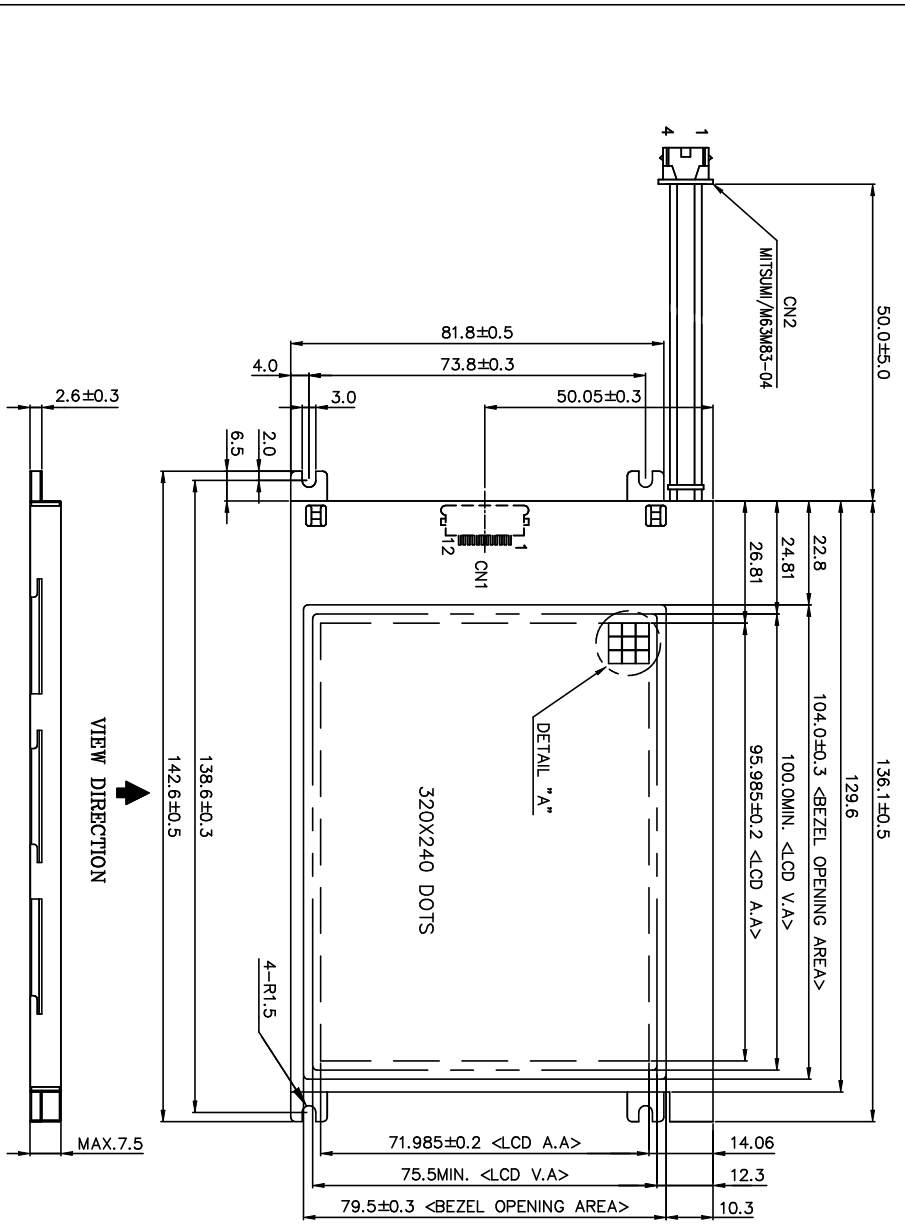
6.	Outer dimensions	Should be with in the tolerance.
7.	Newton ring	Orbicular of interference fringes. To be non. In case of doubtful judgenemt, agreement shall be reachment.
8.	Soldering	Should be no defective soldering such as shorting, loose terminal cold solder, peeling of printed circuit board pattern, improper mouting position, etc.

5-3 Dot Appearance Defect

NO.	Item	Criteria
1.	Plinhole	 <p>Dot display a and b are each $\leq 0.2\text{mm}$ 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 $\leq 0.2\text{mm}$ The overall total is taken to be with in 10 units.</p>
3.	Thick and thin display	 <p>Taken to be within $\pm 1.5\%$ of display character width(a) and height(b).</p>

REV/DATE	R0/ 4.15.2000'								BY SEAN HU
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NAN YA PLASTICS CORP. ELEC. MATERIALS DIV. LCD DEPARTMENT		SPECIFICATION				SPEC. NO. : LM372-0 DATE : Apr. 15, 2000 SHEET NO. : 22/23	
<p>NOTICE:</p> <ul style="list-style-type: none"> • SAFETY <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 with a soft cloth soaked with a cleaning naphtha solvent. • STORAGE <ul style="list-style-type: none"> 1.Store the panel or module in a dark place where the temperature is 25°C±5°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 <ul style="list-style-type: none"> 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. • THE OPERATING LIFE TIME OF BACK LIGHT CCFT : 20,000hrs for lamp-current 5mA, 35KHz, 25°C (Operating life time is defined as follows : The final brightness is at 50% of original brightness.) 							
REV/DATE	R0/ 4.15.2000'						BY SEAN HU



CN1: ELCO/6224-12P-S-A OR COMPATIBLE

Pin No.	Symbol	Level	Function
1	FRAME	H	FIRST LINE MARKER
2	LOAD	H → L	DATA LATCH
3	CP	H → L	DATA SHIFT
4	VDD	-	POWER SUPPLY FOR LOGIC
5	VSS	-	GND
6	VEE	-	POWER SUPPLY FOR LC
7	DO	-	
8	D1	H/L	DISPLAY DATA
9	D2	H/L	
10	D3	H/L	
11	DISPOFF	H/L	H: ON/L: OFF
12	NC	-	-

CN2/CN1 CONNECTOR: MITSUMI/MS3MBS-04 OR COMPATIBLE

Pin No.	Symbol	Function
1	GND	GROUND LINE (INVERTER)
2	NC	NO CONNECTION
3	NC	NO CONNECTION
4	HV	HIGH VOLTAGE LINE (INVERTER)

- NOTES :
- RESOLUTION : 800 X 240 DOTS
 - DRIVER IC : "OUT" LIGHT EYE (COM) LIGHT EYE (SEG)
 - BACKGROUND : CRT (WHITE)
 - FRAME : 819 480
 - TOLERANCE NOT SPECIFIED : ±0.05mm

Pin No.	Symbol	Function
1	GND	GROUND LINE (INVERTER)
2	NC	NO CONNECTION
3	NC	NO CONNECTION
4	HV	HIGH VOLTAGE LINE (INVERTER)

REV. NO.	DESCRIPTION	DATE	DESIGN	CHECK	APPROVE

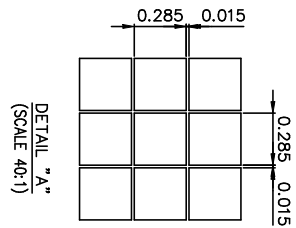
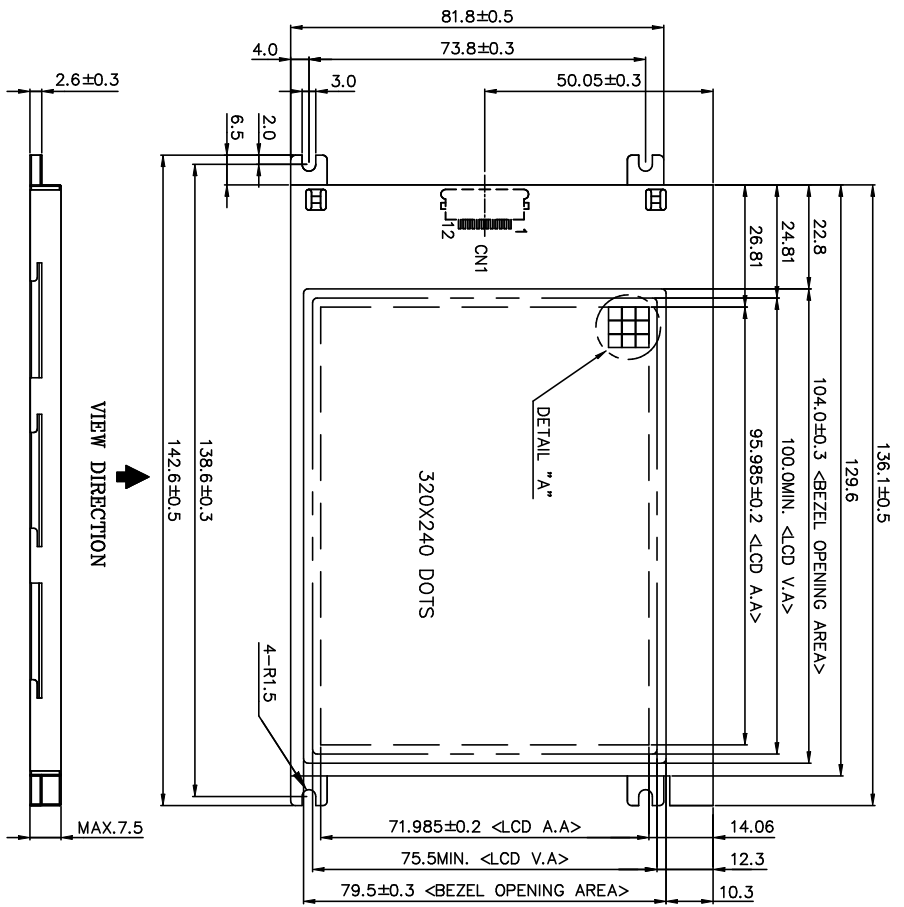
APPROVE		THIRD ANGLE P.
CHECK		
DESIGN	JS HIANG	88.02.19
DRAWN	JS HIANG	88.02.19
NAME		DATE
		1/1
DWG NO.	M372AD0A	SCALE UNIT
		1/1 mm

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

LITBE9_372

SHEET NO 23-1/23





CN1: ELCO/6224-12P-S-A OR COMPATIBLE

Pin NO.	SYMBOL	LEVEL	FUNCTION
1	FRAME	H	FIRST LINE MARKER
2	LOAD	H → L	DATA LATCH
3	CP	H → L	DATA SHIFT
4	VDD	-	POWER SUPPLY FOR LOGIC
5	VSS	-	GND
6	VEE	-	POWER SUPPLY FOR LC
7	D0	-	-
8	D1	-	-
9	D2	H/L	DISPLAY DATA
10	D3	-	-
11	DISPOFF	H/L	H: ON/L: OFF
12	NC	-	-

- NOTES :
- RESOLUTION : 320 X 240 DOTS
 - FRAME : 512 X 432
 - TOLERANCE NOT SPECIFIED : ±0.5mm

REV. NO.	DESCRIPTION	DATE	DESIGN	CHECK	APPROVE
△					
△					
△					
△					

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

製品圖

LTAIE9_372

APPROVE	CHECK	DESIGN	DRAWN	DWG NO.
	Y.C. LU	9/05/29		M372BDD0A
	Y.C. LU	9/05/29		
	NAME	DATE		
		1/1		

SHEET NO 23-2/23