

NAN YA PLASTICS CORPORATION

SPECIFICATION OF
LCD MODULE
PRODUCT NO.: LMCDB_078_13_

SPEC. NO.: LM078-13-~~0~~△

CUSTOMER
APPROVED BY
DATE:

LCD DEPARTMENT
ELECTRONIC MATERIALS DIVISION
NAN YA PLASTICS CORPORATION
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TEL: 886-2-27122211 EXT. 5993~5995
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E-mail: lcdsales@npc.com.tw

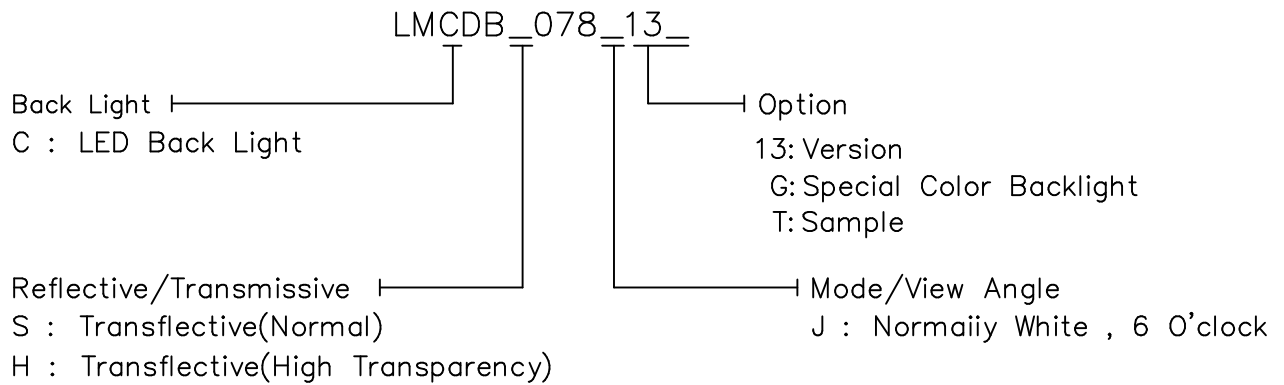
EDITED ON : May. 10, 2001

DESIGN MANAGER	DESIGN CHECK	DESIGNER
		C.F. Su

1. MECHANICAL DATA

- | | |
|---------------------------|--|
| (1) Product No. | LMCDB_078_13_ |
| (2) Module Size | 134.5 (W)mm x 117.0 (H)mm x MAX 14.0 (D)mm |
| (3) Dot Size | 0.27 (W)mm x 0.27 (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 | FSTN:Normally White |
| | Rear Polarizer: <input type="checkbox"/> Transflective(Normally) |
| | <input type="checkbox"/> Transflective(High Transparency) |
| (8) Viewing Direction | 6 O'clock |
| (9) Backlight | LED(Edge Type Backlight) |
| (10) Weight(Included T/P) | 195 g(Approx.) |

Note :



2. ABSOLUTE MAXIMUM RATINGS

(1) ELECTRICAL ABSOLUTE RATINGS

VSS=0V

ITEM	SYMBOL	MIN	MAX	UNIT	COMMENT
Power Supply for Logic	VDD-VSS	-0.3	6.5	V	
Power Supply for LCD Drive	VDD-VO	0	26.0	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	NORMAL TEMP.				WIDE TEMP.			
	OPERATION		STORAGE		OPERATION		STORAGE	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Ambient Temperature	0	50	-20	80	0	50	-20	80
Humidity(Without Condensation)	Note 2,4		Note 3,4		Note 5,4		Note 6,4	

Note 2 $T_a \leq 50^\circ\text{C}$: 85%RH max

$T_a > 50^\circ\text{C}$: Absolute humidity must be lower
than the humidity of 85%RH at 50°C

Note 3 T_a at -20°C will be < 48hrs, at 70°C will be < 120hrs

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

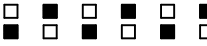
Note 5 $T_a \leq 70^\circ\text{C}$: 75%RH max

$T_a > 70^\circ\text{C}$: Absolute humidity must be lower
then the humidity of 75%RH at 70°C

Note 6 T_a at -30°C will be < 48hrs, at 80°C will be 120hrs

3. ELECTRICAL CHARACTERISTICS

(VDD = 5V±5%)

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
Power Supply for Logic	VDD-VSS	-	4.75	5.0	5.25	V	
Supply Voltage For LC	VDD-VO	Duty=1/240 Bias=1/13	0°C	23.4	23.7	24.0	V
			25°C	21.6	21.9	22.2	V
			50°C	19.6	19.9	20.2	V
Input Voltage	V _{IH}	H level	0.7VDD	-	VDD	V	
	V _{IL}	L level	0	-	0.3VDD	V	
Power Supply Current	IDD	FLM = 70 Hz VDD = 5.0 V VEE = -27.0 V VDD-VO= 21.9V	-	5.4	8.0	mA	
	IEE	PATTERN : 	-	5.3	8.0	mA	
LED Power Supply Voltage	VLED	-	-	9.8	-	V	
LED Power Consumption	ILED	VLED = 9.8V RLED = 0Ω	-	35	-	mA	
LCM Surface Luminance (FOR LMCDBH078J13G_)	L	ALL PIXEL ON	-	3.4	-	cd/m ²	
		ALL PIXEL OFF	-	9.0	-	cd/m ²	
LCM Surface Luminance (FOR LMCDBS078J13G_)	L	ALL PIXEL ON	-	2.0	-	cd/m ²	
		ALL PIXEL OFF	-	5.5	-	cd/m ²	

3.2 LED BACKLIGHT : (EDGE LED BACKLIGHT)

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
LUMINOUS INTENSITY	IN	IF=35mA TA=25°	32	35	-	cd/m ²
AVG.X OF 1931 C.I.E.	X		0.19	0.27	0.35	-
AVG.Y OF 1931 C.I.E.	Y		0.24	0.32	0.40	-
FORWARD VOLTAGE	V _F		8.7	10.2	11.7	V
REVERSE CURRENT	I _R	V _R =15V	-	-	0.4	mA

4. OPTICAL CHARACTERISTICS

AT V_{OP}

ITEM MODE		Cr(Contrast Ratio)						θ (Viewing Angle)		ϕ (Viewing Angle)	
		0℃		25℃		50℃		25℃		25℃	
		MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.
S	J	-	5.5	-	6.5	-	5.0	-	32	-	77
H	J	-	5.0	-	5.0	-	4.5	-	29-30	-	25-28
note		NOTE6						NOTE5			

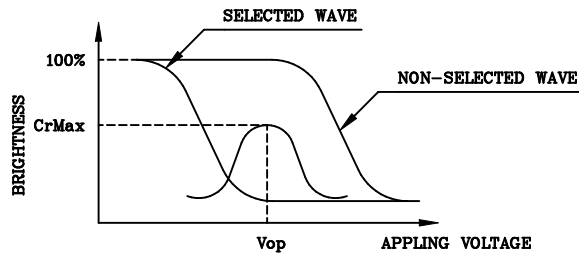
Note: S: Transflect(Normal)
H: Transflect(High)
J: Normally White

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

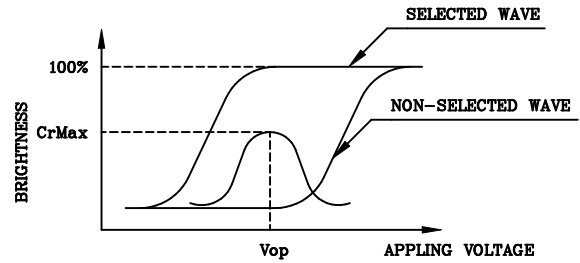
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Response Time (rise)	Tr	0℃	—	660	900	ms	NOTE 2
		25℃	—	160	240		
		50℃	—	110	165		
Response Time (fall)	Tf	0℃	—	560	840	ms	NOTE 2
		25℃	—	90	140		
		50℃	—	75	110		

(NOTE 1)

Definition of Operation Voltage(Vop)



(positive type)



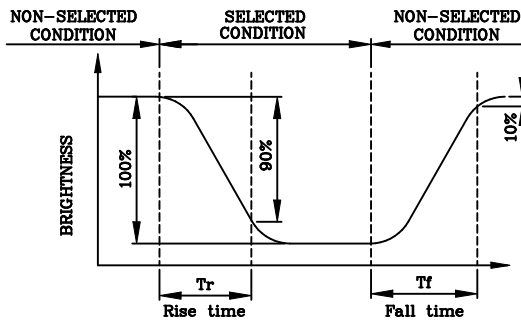
(negative type)

*Conditions

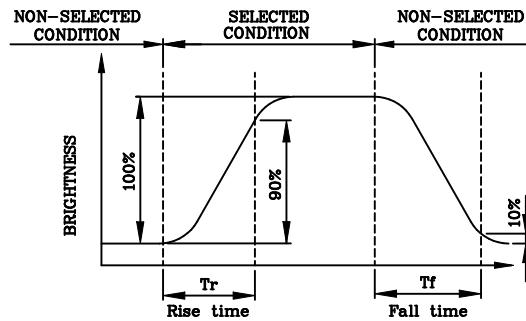
Viewing Angle : 0
 Frame Frequency : 70Hz
 Applying Waveform : 1/N duty 1/a bias

(NOTE 2)

Definition of Response Time(Tr,Tf)



(positive type)



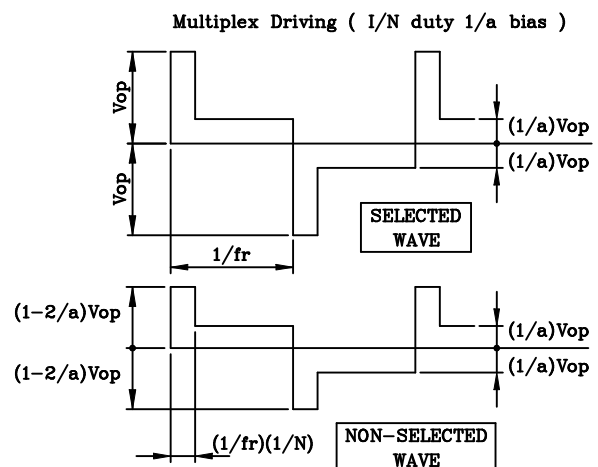
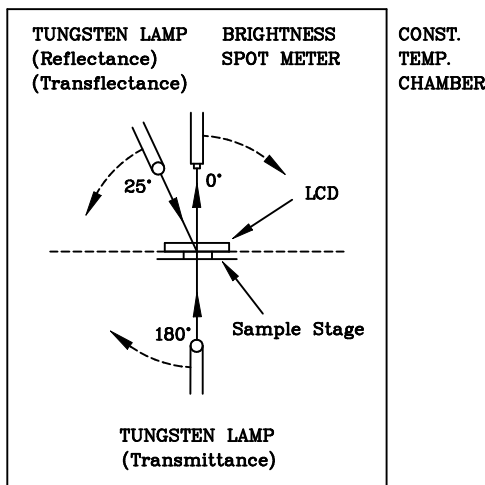
(negative type)

*Conditions

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

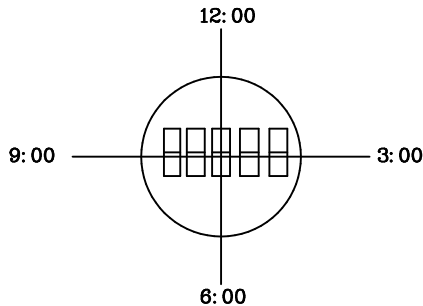
(NOTE 3)

Description of Measuring Equipment and Driving Waveforms



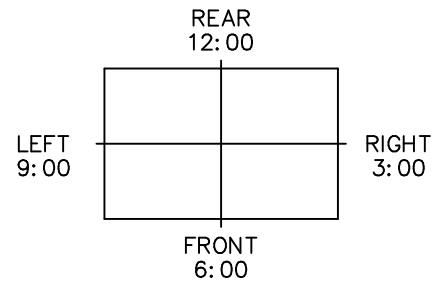
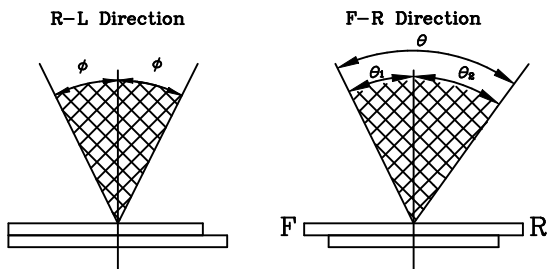
(NOTE 4)

Definition of Viewing Direction



(NOTE 5)

Definition of Viewing Angle



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

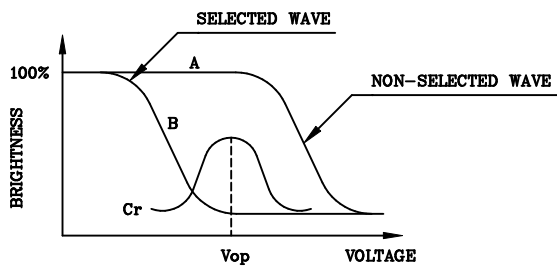
$$\theta = \theta_1 + \theta_2$$

*Conditions

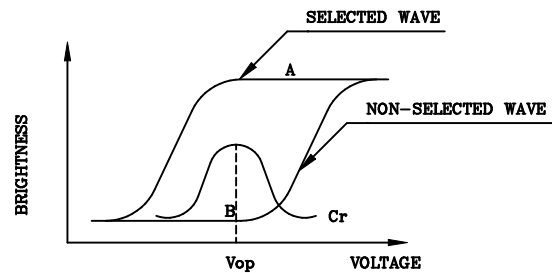
Operating Voltage : V_{op}
 Frame Frequency : 70Hz
 Applying Waveform : 1/N duty 1/a bias
 Contrast Ratio : larger than 2

(NOTE 6)

Definition of Contrast Ratio (Cr)



(positive type)



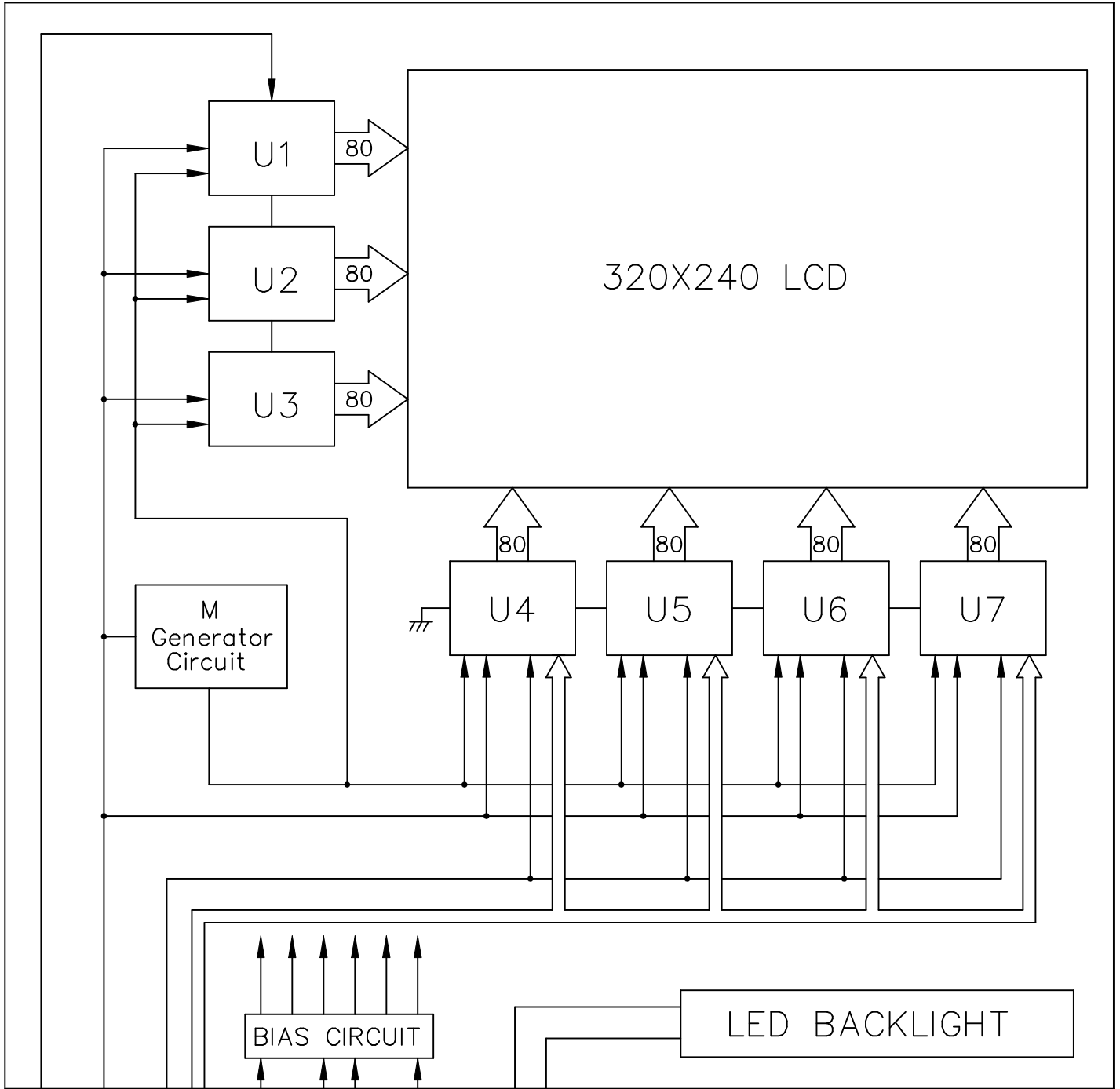
(negative type)

Contrast Ratio : $Cr = A/B$

*Conditions

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

5. BLOCK DIAGRAM



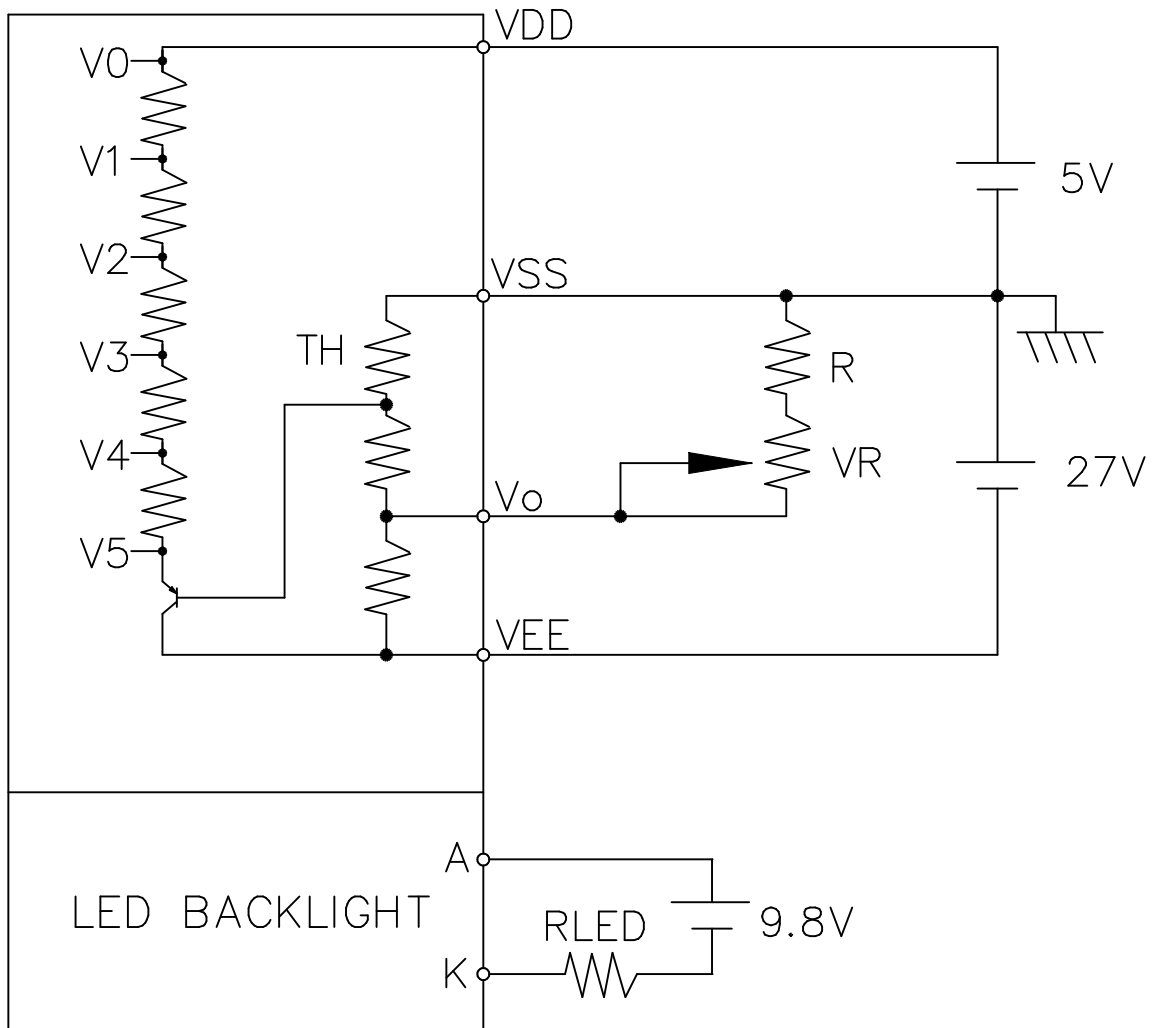
* AC SIGNAL SETTING

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

6. INTERNAL PIN CONNECTION

PIN NO.	SYMBOL	LEVEL	FUNCTION
1	VO	-	OPERATING VOLTAGE FOR LCD
2	VEE	-	POWER SUPPLY FOR LCD
3	D3	H/L	DISPLAY DATA 3
4	D2	H/L	DISPLAY DATA 2
5	D1	H/L	DISPLAY DATA 1
6	D0	H/L	DISPLAY DATA 0
7	VSS	-	GND
8	VDD	-	POWER SUPPLY FOR LOGIC
9	CL2	H→L	DATA SHIFT
10	CL1	H→L	DATA LATCH
11	FLM	H/L	SCAN START PULSE
12	K	-	POWER SUPPLY FOR LED BACKLIGHT
13	A	-	POWER SUPPLY FOR LED BACKLIGHT
14	NC	-	NO CONNECTION

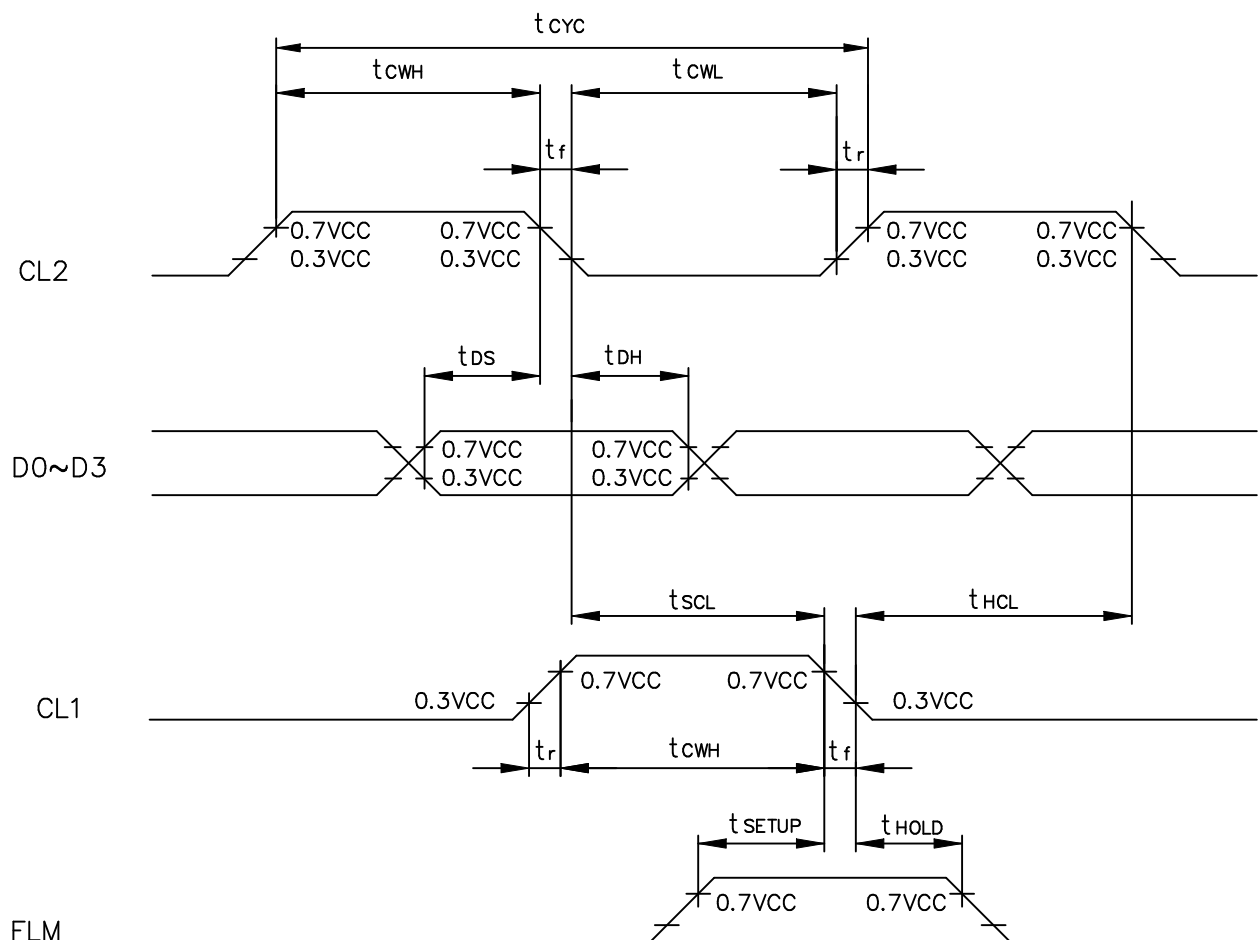
7. POWER SUPPLY



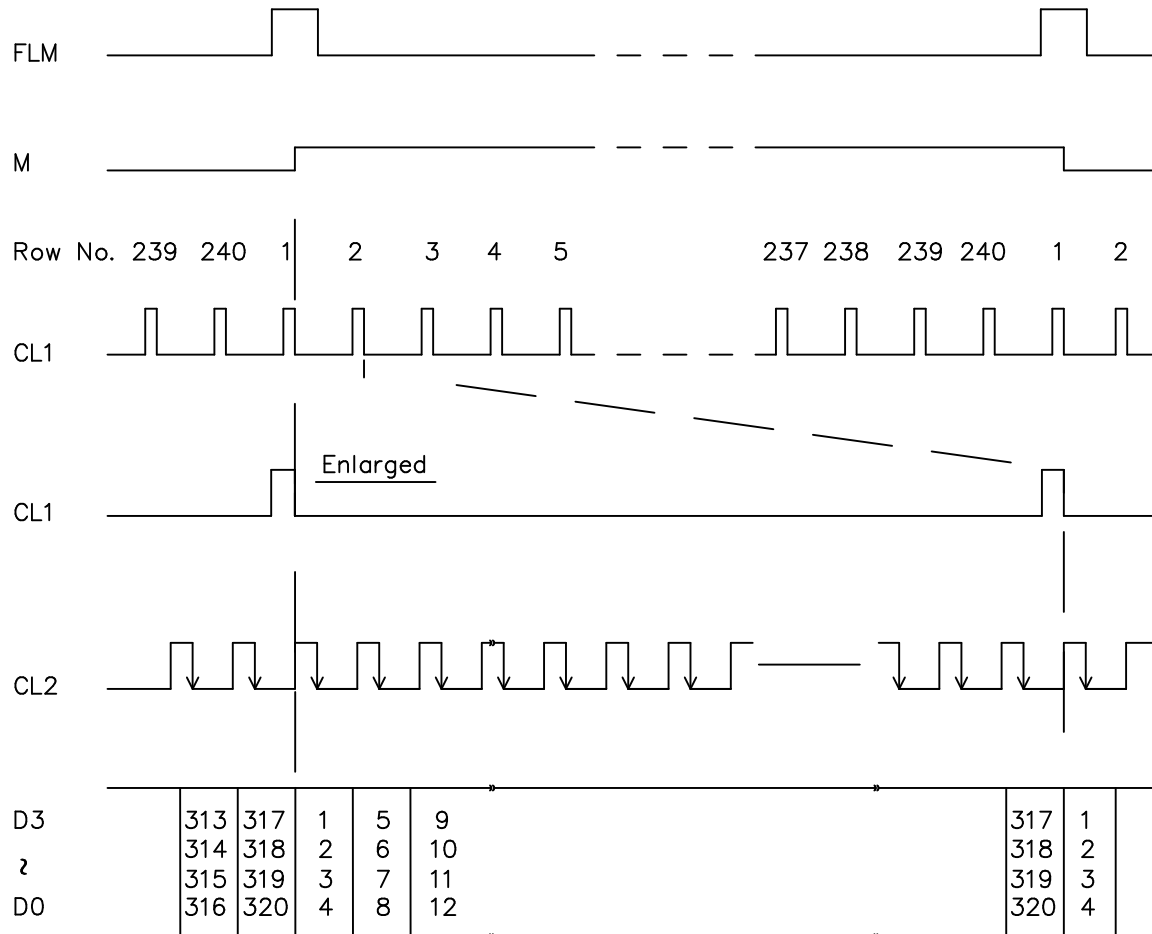
RECOMMENDED VR : 30K~50K Ω
 R : 4.3K Ω
 RLED : 0 Ω

8.1 TIMING CHARACTERISTICS

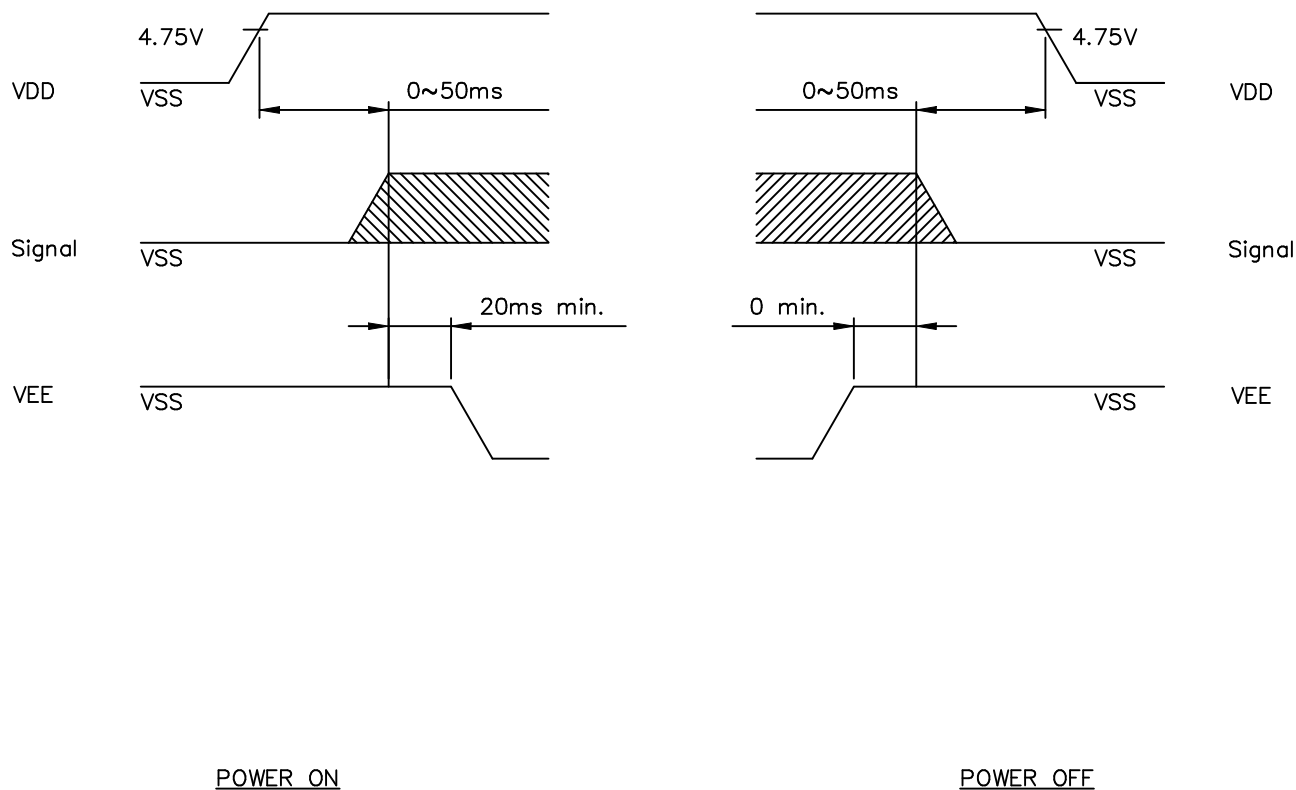
ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
CLOCK CYCLE TIME	t_{cyc}	125	-	-	ns
CLOCK HIGH LEVEL WIDTH	t_{cwh}	40	-	-	ns
CLOCK LOW LEVEL WIDTH	t_{cwl}	40	-	-	ns
CLOCK RISE TIME	t_r	-	-	30	ns
CLOCK FALL TIME	t_f	-	-	30	ns
DATA SETUP TIME	t_{ds}	20	-	-	ns
DATA HOLD TIME	t_{dh}	20	-	-	ns
CLOCK SETUP TIME	t_{scl}	80	-	-	ns
CLOCK HOLD TIME	t_{hcl}	80	-	-	ns
FLM SETUP TIME	t_{setup}	100	-	-	ns
FLM HOLD TIME	t_{hold}	100	-	-	ns



8.2 TIMING CHART OF INPUT SIGNALS



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

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 → 70°C, 30min → 25°C.5min (1cycle)			Appearance without defect	5 cycles

Inspection Provision

1. Purpose

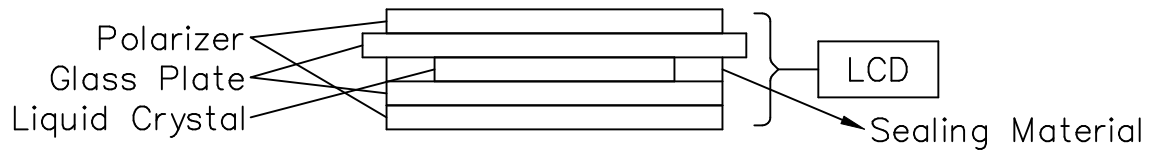
The NAN YA inspection provision provides outgoing inspection provision and its expected quality level based on our outgoing inspection of NAN YA LCD produces.

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 Provision

Outgoing inspection is according to the product inspection manual.

4-1 Inspection Method

MIL-STD-105D Level II Regular inspection

4-2 Inspection Standard

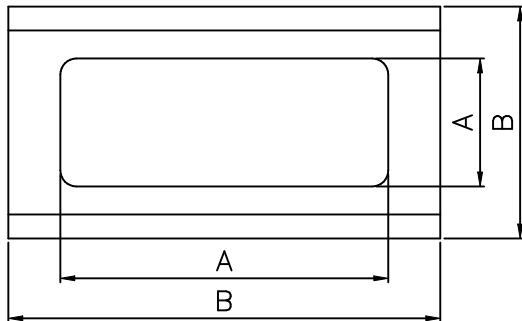
	Item		AQL(%)	Remarks
Major Defect	Dots	Opens Shorts Erroneous operation	0.4	faults which substantially lower the practicality and the initial purpose difficult to achieve.
	Solder appearance	Shorts Loose		
	Cracks	Display surface cracks		

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.

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

Otherwise specified.

Temperature 20± 15°C
 Humidity 65± 20%R.H..
 Pressure 860~1060hPa(mmbar)

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

Temperature 20± 15°C
 Humidity 65± 20%R.H..
 Pressure 860~1060hPa(mmbar)

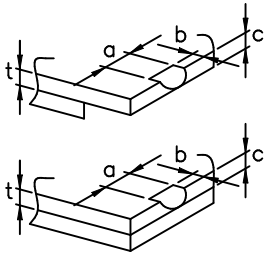
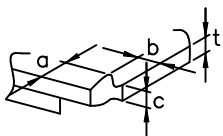
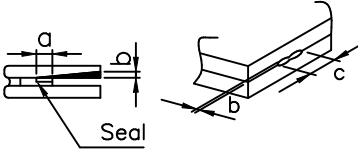
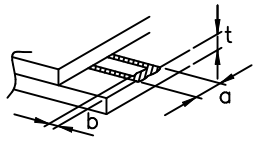
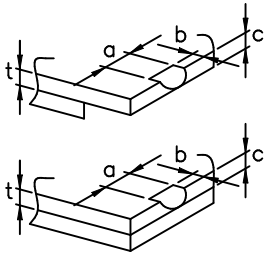
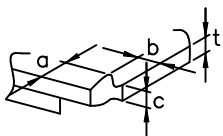
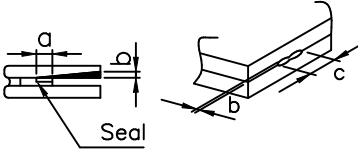
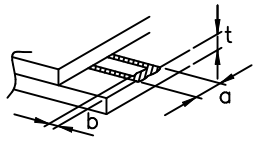
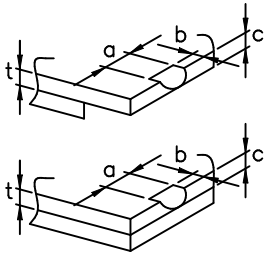
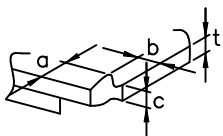
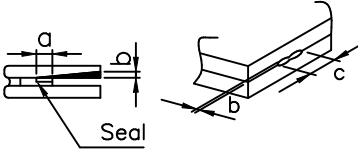
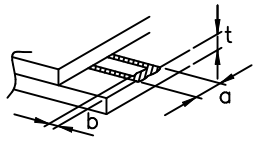
5.Specification for quality check
 5-1 Electrical characteristics

NO.	Item	Criterion
1.	Non operational	NO-GO
2.	Miss operating	NO-GO
3.	Missing dot	NO-GO
4.	Contrast irregular	Non detectable
5.	Response time	Within Specified value
6.	Tablet contact resistance	NO-GO
7.	backlight turn on/off	NO-GO

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" 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>$D \leq 0.1$</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" 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>$D \leq 0.3$</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
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																			

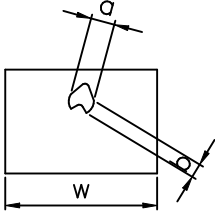
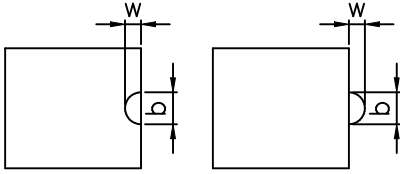
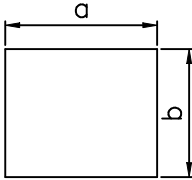
1.	Black spots, foreign matter, and white spots (Including light leakage due to pinholes of polarizing plates, etc.)	<p>(1)-1 Spots(At non lighting condition)</p> <table border="1" data-bbox="710 425 1452 712"> <thead> <tr> <th>Width(mm): W</th> <th>Length(mm):L</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td>$W \leq 0.03$</td> <td>Ignore</td> <td>Ignore</td> </tr> <tr> <td>$0.03 < W \leq 0.08$</td> <td>$L \leq 4$</td> <td>2</td> </tr> <tr> <td>$0.08 < W \leq 0.1$</td> <td>$L \leq 1$</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 Spots(At lighting condition)</p> <table border="1" data-bbox="710 1019 1452 1305"> <thead> <tr> <th>Width(mm): W</th> <th>Length(mm):L</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td>$W \leq 0.03$</td> <td>Ignore</td> <td>Ignore</td> </tr> <tr> <td>$0.03 < W \leq 0.08$</td> <td>$L \leq 3$</td> <td>6</td> </tr> <tr> <td>$0.08 < W$</td> <td>$3 < L$</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
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																								
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 667"> <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 667" rowspan="2">Average diameter = (Long diameter + Short diameter)/2</th> </tr> <tr> <td data-bbox="710 526 970 667">D ≤ 0.3 0.3 < D</td> <td data-bbox="970 526 1225 667">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					
Average Diameter (mm):D	Number of pieces permitted	Average diameter = (Long diameter + Short diameter)/2										
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>a ≤ 5 b ≤ 2 c ≤ t</p> <p>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="662 1171 1066 1361"> <p>(2) Corner crack</p>  </td> <td data-bbox="1066 1171 1473 1361"> <p>a ≤ 2.5 b ≤ 2.5 c ≤ t a + b ≤ 4</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>a ≤ The seal width × 1/3 b ≤ t × 2/3 c ≤ 5</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>a ≤ 5 b ≤ 1/3 pin length c ≤ t</p> </td> </tr> <tr> <td data-bbox="662 1870 1066 1964"> <p>(5) Progressive cracks</p> </td> <td data-bbox="1066 1870 1473 1964"> <p>All taken to be unacceptable.</p> </td> </tr> </table>		<p>(1) General crack</p> 	<p>a ≤ 5 b ≤ 2 c ≤ t</p> <p>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>(2) Corner crack</p> 	<p>a ≤ 2.5 b ≤ 2.5 c ≤ t a + b ≤ 4</p>	<p>(3) Seal portion crack</p> 	<p>a ≤ The seal width × 1/3 b ≤ t × 2/3 c ≤ 5</p> <p>The numbers of pieces are set at up to 5 pieces.</p>	<p>(4) ITO Pin crack</p> 	<p>a ≤ 5 b ≤ 1/3 pin length c ≤ t</p>	<p>(5) Progressive cracks</p>	<p>All taken to be unacceptable.</p>
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<p>(5) Progressive cracks</p>	<p>All taken to be unacceptable.</p>											

SPECIFICATION

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.	Pinhole	 <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>

(2) NOTE:

• 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 with 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.

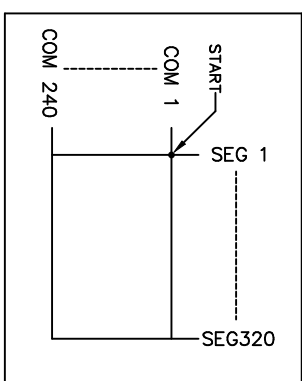
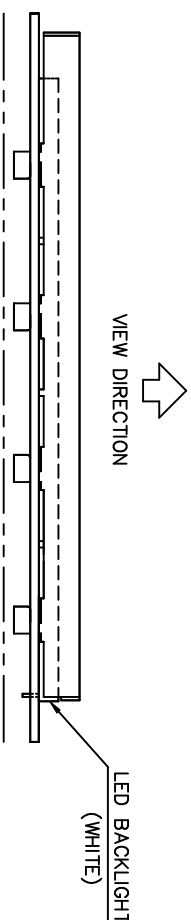
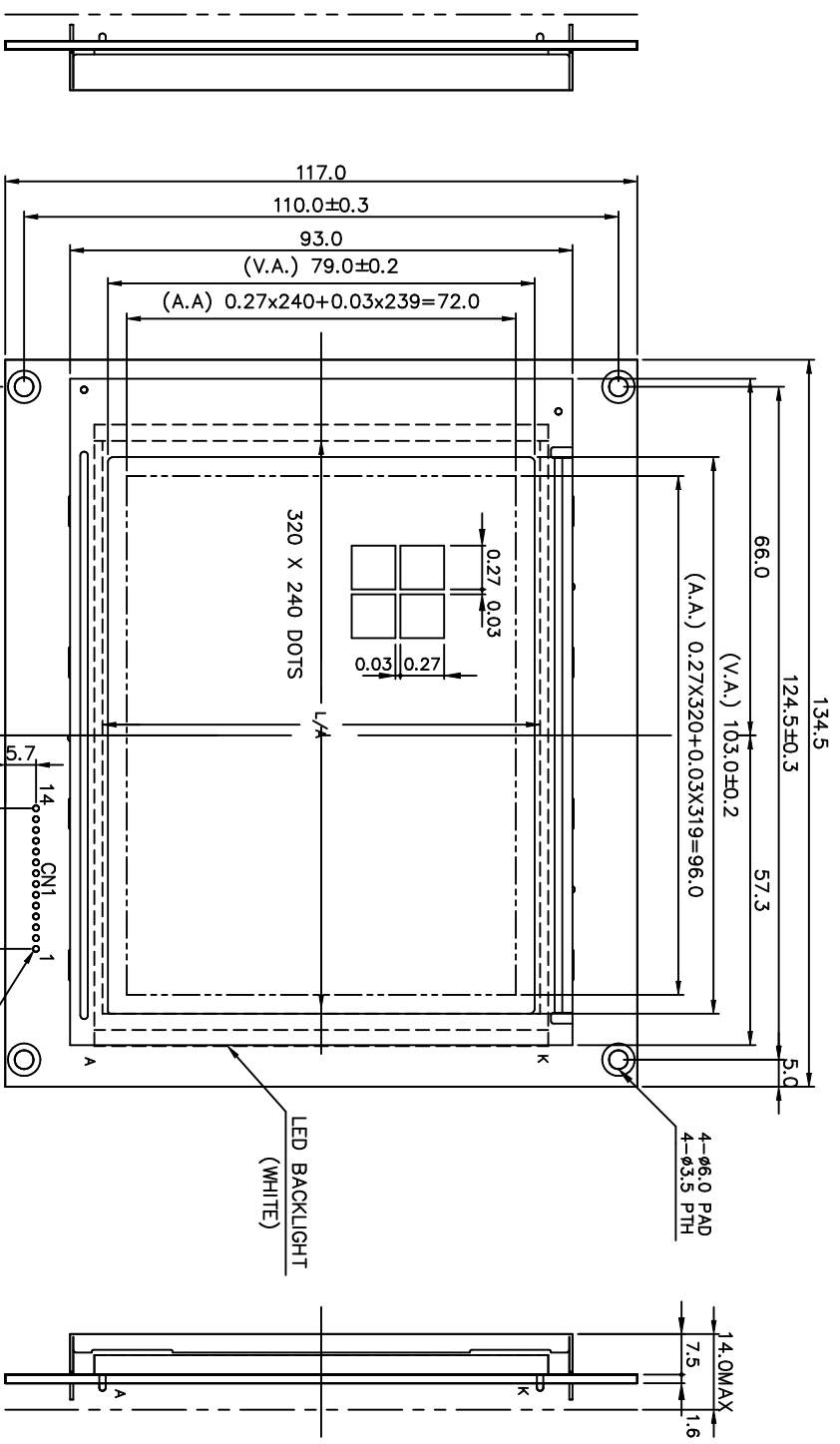
• TERMS OF WARRANT

- 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.

• THE OPERATING LIFE TIME OF BACK LIGHT

LED : 40,000hrs for IF 10mA , 25°C

(Operating life time is defined as follows: The final brightness is at 50% of original brightness.)



- NOTES:
- 1.RESOLUTION: 320X240 DOTS
 - 2.BACKLIGHT: LED (WHITE)
 - 3.FRAME MATERIAL: SECC

GENERAL TOLERANCE LIST

DIMENSION	TOLERANCE
$L \leq 6$	± 0.25 (mm)
$6 < L \leq 18$	± 0.3 (mm)
$18 < L \leq 50$	± 0.4 (mm)
$50 < L \leq 125$	± 0.5 (mm)
$125 < L$	± 0.6 (mm)
ANGLE	$\pm 1^\circ$ (DEG)


 南亚塑胶工业股份有限公司
 NAN YA PLASTICS CORPORATION
 製品圖

LMCDB5078J13

APPROVE _____ THIRD ANGLE P.

*(CN1) INTERFACE PIN CONNECTION

PinNo.	Symbol	Level	Function	PinNo.	Symbol	Level	Function
1	VO	-	Operating voltage for LED driving	8	VDD	-	Power supply for logic(+5V)
2	VEE	-	Power supply for LED driving	9	CL2	H-L	Display data fetch pulse
3	D3	H/L	Display data 3	10	CL1	H-L	Display data fetch pulse
4	D2	H/L	Display data 2	11	FLM	H/L	Scan start pulse
5	D1	H/L	Display data 1	12	K	-	Power supply for LED backlight(K)
6	DO	H/L	Display data 0	13	A	-	Power supply for LED backlight(A)
7	VSS	-	GND for logic(0V)	14	NC	-	-

REV. NO.	DESCRIPTION	DATE	DESIGN	CHECK	APPROVE	DWG. NO.
△						M078-D13A
△						
△						
△						