

NAN YA PLASTICS CORPORATION

Specification of LCD Module □
NLC-122x032-xxxx

SPEC. NO.: LM042-13A- 



admatec

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EDITED ON : Jul. 28, 2000

DESIGN MANAGER	DESIGN CHECK	DESIGNER
		M.Y. Lin

1. MECHANICAL DATA

- | | |
|--------------------------|--|
| (1) Product No. | NLC-122x032-xxxx |
| (2) Module Size | 66.1 (W)mm x 27.3 (H)mm x 8.5 (D)mm
(W/O, EL B.L.) |
| (3) Dot Size | 0.40 (W)mm x 0.45 (H)mm |
| (4) Dot Pitch | 0.44 (W)mm x 0.49 (H)mm |
| (5) Number of Characters | 122 (W) x 32 (H)DOTs |
| (6) Duty | 1/32 |
| (7) LCD Display Mode | STN: <input type="checkbox"/> Gray Mode <input type="checkbox"/> Yellow Mode
Rear Polarizer: <input type="checkbox"/> Reflective <input type="checkbox"/> Transflective |
| (8) Viewing Direction | 6 O'clock |
| (9) Backlight | <input type="checkbox"/> W/O <input type="checkbox"/> EL B/L |
| (10) LCD Controller | AX6120AA |
| (11) Weight | W/O B/L: 16.0 g
EL B/L: 17.0 g |

Note :

NLC- 122x032- x x x x

Back Light |-----|
A : None Back Light
D : EL Back Light

Reflective/Transmissive |-----|
R : Reflective
S : Transflective

|-----| Option
M : Graphic product Usint 180° Twist LC
D : Wide Temperature
13 : Version
T : Testing Sample

|-----| Mode/View Angle
A : Gray , 6 O'clock
C : Yellow , 6 O'clock

2. ABSOLUTE MAXIMUM RATINGS

(1) ELECTRICAL ABSOLUTE RATINGS

V_{SS}=0V

	SYMBOL	MIN	MAX	UNIT	COMMENT
Power Supply for Logic	VDD-VSS	-0.3	6.5	V	
Input Voltage	V _I	-0.3	VDD	V	
Static Electricity	-	-	-		Note 1

Note 1 LCM should be grounded during handling LCM.

(2) ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	NORMAL TEMP.				WIDE TEMP.			
	OPERATING		STORAGE		OPERATING		STORAGE	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
Ambient Temperature	0	50	-20	70	-20	70	-30	80
Humidity (Without Condensation)	Note 1,3		Note 2,3		Note 3,4		Note 3,5	

Note 1 Ta ≤ 50°C : 85%RH max
Ta > 50°C : Absolute humidity must be lower
than the humidity of 85%RH at 50°C

Note 2 Ta at -20°C will be < 48hrs, at 70°C will be < 120hrs

Note 3 Background color changes slightly depending on ambient temperature.
This phenomenon is reversible.

Note 4 Ta ≤ 70°C : 75%RH max
Ta > 70°C : Absolute humidity must be lower
than the humidity of 75%RH at 70°C

Note 5 Ta at -30°C will be < 48hrs, at 80°C will be < 120hrs

3. ELECTRICAL CHARACTERISTICS

(VDD = 5V±10%)

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT										
Input Voltage	VIH	H level	0.8VDD	-	VDD	V										
	VIO	L level	0	-	0.2VDD	V										
Recommended LC Driving Voltage (NORMAL TEMP. LCM)	VDD-VEE	DUTY=1/32 Bias=1/4	0°C	-	5.3	-	V									
			25°C	-	4.9	-										
			50°C	-	4.2	-										
Recommended LC Driving Voltage (WIDE TEMP. LCM)	VDD-VEE	DUTY=1/32 Bias=1/4	-20°C	-	6.8	-	V									
			0°C	-	6.7	-										
			25°C	-	6.2	-										
			50°C	-	6.1	-										
			70°C	-	5.7	-										
Power Supply Current (NORMAL TEMP. LCM)	IDD	VDD=5.0V VDD-VEE=4.9V PATTERN :	-	0.4	0.6	mA										
	IEE	<table border="0"> <tr> <td>□</td><td>■</td><td>□</td><td>■</td><td>□</td><td>■</td> </tr> <tr> <td>■</td><td>□</td><td>■</td><td>□</td><td>■</td><td>□</td> </tr> </table>	□	■	□		■	□	■	■	□	■	□	■	□	-
□	■	□	■	□	■											
■	□	■	□	■	□											
Power Supply Current (WIDE TEMP. LCM)	IDD	VDD=5.0V VDD-VEE=6.2V PATTERN :	-	0.5	0.75	mA										
	IEE	<table border="0"> <tr> <td>□</td><td>■</td><td>□</td><td>■</td><td>□</td><td>■</td> </tr> <tr> <td>■</td><td>□</td><td>■</td><td>□</td><td>■</td><td>□</td> </tr> </table>	□	■	□		■	□	■	■	□	■	□	■	□	-
□	■	□	■	□	■											
■	□	■	□	■	□											
Power Supply Current For EL	IEL	VBL=110VAC 400Hz	-	2.1	3.5	mA										
Power Supply Current For LED	ILED	VBL=5VDC	-	100	150	mA										
LCM Surface Luminance	LMC84S042C13M_	L	VDD=5.0V VDD-VEE=4.9V ILED=100mA	PATTERN: (Dots All On)	-	4.5	-	cd/m ²								
				PATTERN: (Dots All Off)	-	14.6	-									
	LMC84T042B13M_	L	VDD=5.0V VDD-VEE=4.9V ILED=100mA	PATTERN: (Dots All On)	-	12.1	-	cd/m ²								
				PATTERN: (Dots All Off)	-	44.4	-									
LMD84S042K13M_	L	VDD=5.0V VDD-VEE=4.9V VBL=110VAC 400Hz	PATTERN: (Dots All On)	-	2.3	-	cd/m ²									
			PATTERN: (Dots All Off)	-	8.1	-										

4. OPTICAL CHARACTERISTICS

4-1. FOR NORMAL TEMPERATURE MODE LCM

AT Vop

ITEM MODE		Cr(Contrast Ratio)						θ (Viewing Angle)		ϕ (Viewing Angle)	
		0°C		25°C		50°C		50°C		50°C	
		MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.
R	C	-	5.0	-	4.5	-	4.5	-	58	-	(L) 22 (R) 24
S	C	-	4.5	-	3.5	-	4.5	-	59	-	(L) 20 (R) 26
	K	-	5.5	-	5.5	-	5.5	-	69	-	(L) 22 (R) 29
T	B	-	2.5	-	2.5	-	2.0	-	28	-	(L) 9 (R) 26
NOTE		NOTE 6						NOTE 5			

NOTE :

R: REFLECTIVE
S: TRANFLECTIVE
T: TRANSMISSIVE
A.B: GRAY
C: YELLOW
K: NORMALLY WHITE

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

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Response Time (rise)	Tr	0°C	-	1000	-	ms	NOTE 2
		25°C	-	300	-		
		50°C	-	100	-		
Response Time (fall)	Tf	0°C	-	500	-	ms	NOTE 2
		25°C	-	150	-		
		50°C	-	100	-		

4-2.FOR WIDE TEMPERATURE MODE LCM

AT Vop

ITEM		Cr(Contrast Ratio)										θ (Viewing Angle)		ϕ (Viewing Angle)	
		-20°C		0°C		25°C		50°C		70°C		25°C		25°C	
		MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.	MIN.	TYP.
R	C	-	4.5	-	4.5	-	4.0	-	4.0	-	3.0	-	52	-	(L) 34 (R) 22
note		NOTE 6										NOTE 5			

NOTE :

R: REFLECTIVE

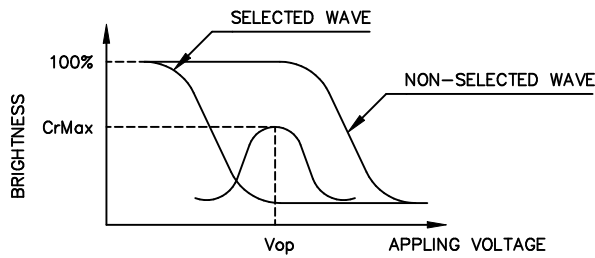
C: YELLOW

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

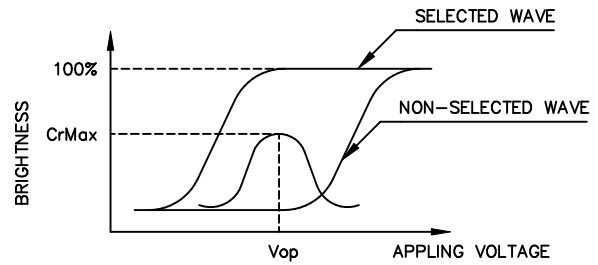
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Response Time (rise)	Tr	-20°C	-	2000	-	ms	NOTE 2
		0°C	-	400	-		
		25°C	-	80	-		
		50°C	-	70	-		
		70°C	-	50	-		
Response Time (fall)	Tf	-20°C	-	1000	-	ms	NOTE 2
		0°C	-	300	-		
		25°C	-	100	-		
		50°C	-	60	-		
		70°C	-	50	-		

(NOTE 1)

Definition of Operation Voltage(Vop)



(positive type)



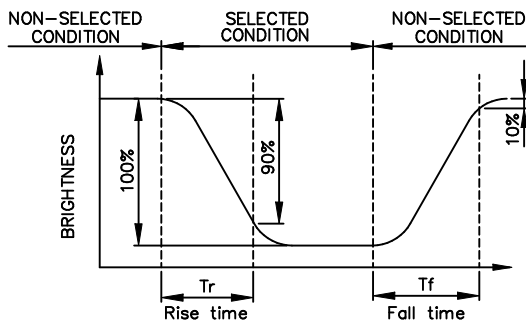
(negative type)

*Conditions

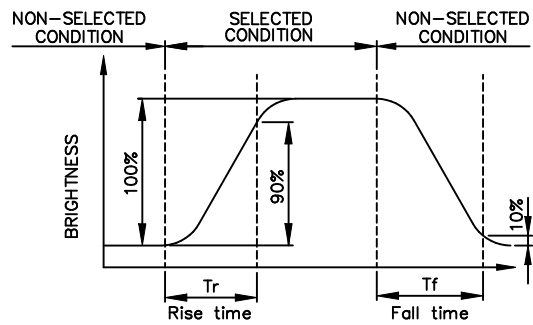
Viewing Angle : 0
 Frame Frequency : 70Hz
 Applying Waveform : 1/N duty 1/a bias

(NOTE 2)

Definition of Response Time(Tr,Tf)



(positive type)



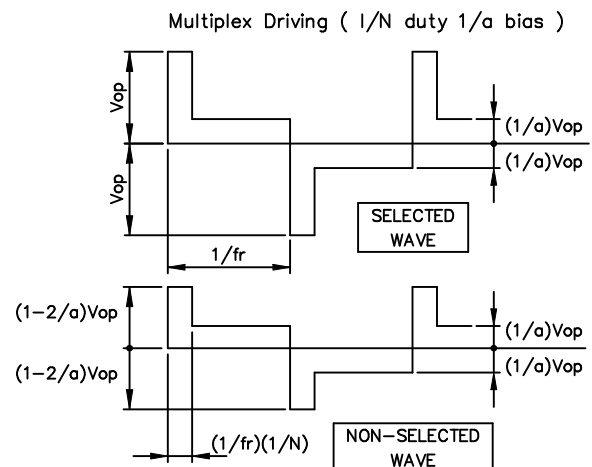
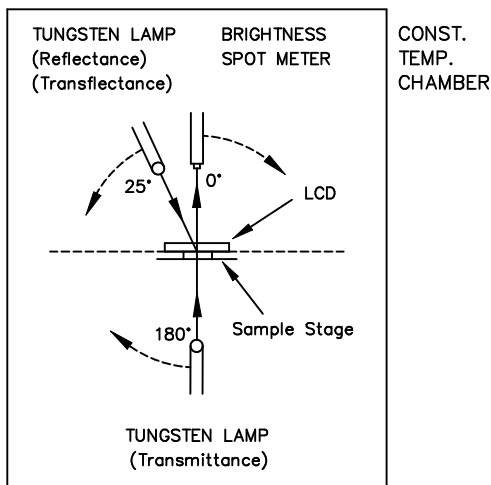
(negative type)

*Conditions

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

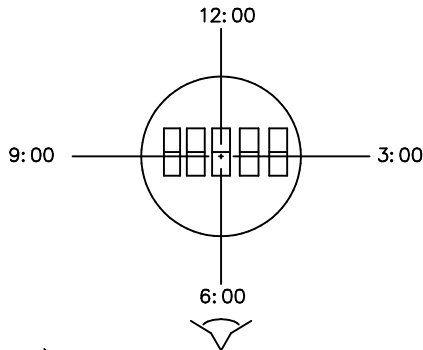
(NOTE 3)

Description of Measuring Equipment and Driving Waveforms



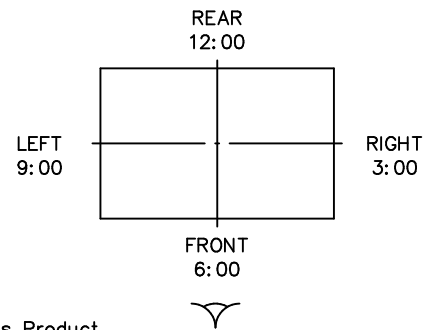
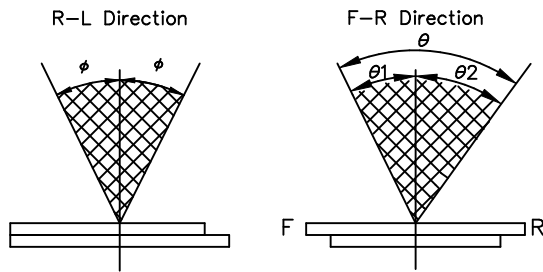
(NOTE 4)

Definition of Viewing Direction



(NOTE 5)

Definition of Viewing Angle



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

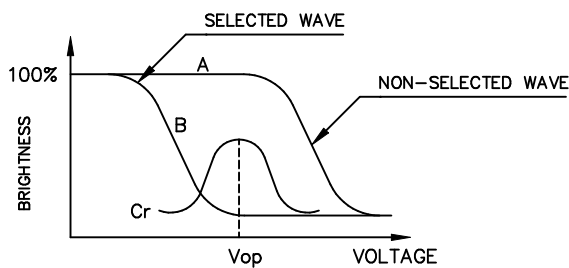
$$\theta = \theta_1 + \theta_2$$

*Conditions

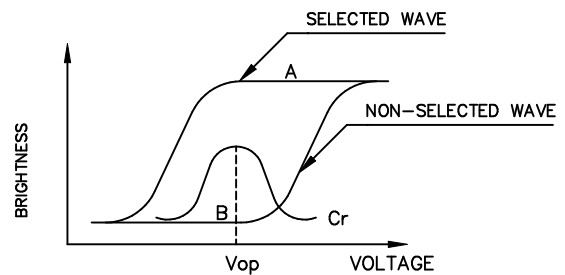
Operating Voltage : V_{op}
 Frame Frequency : 70Hz
 Applying Waveform : 1/N duty 1/a bias
 Contrast Ratio : larger than 2

(NOTE 6)

Definition of Contrast Ratio (Cr)



(positive type)



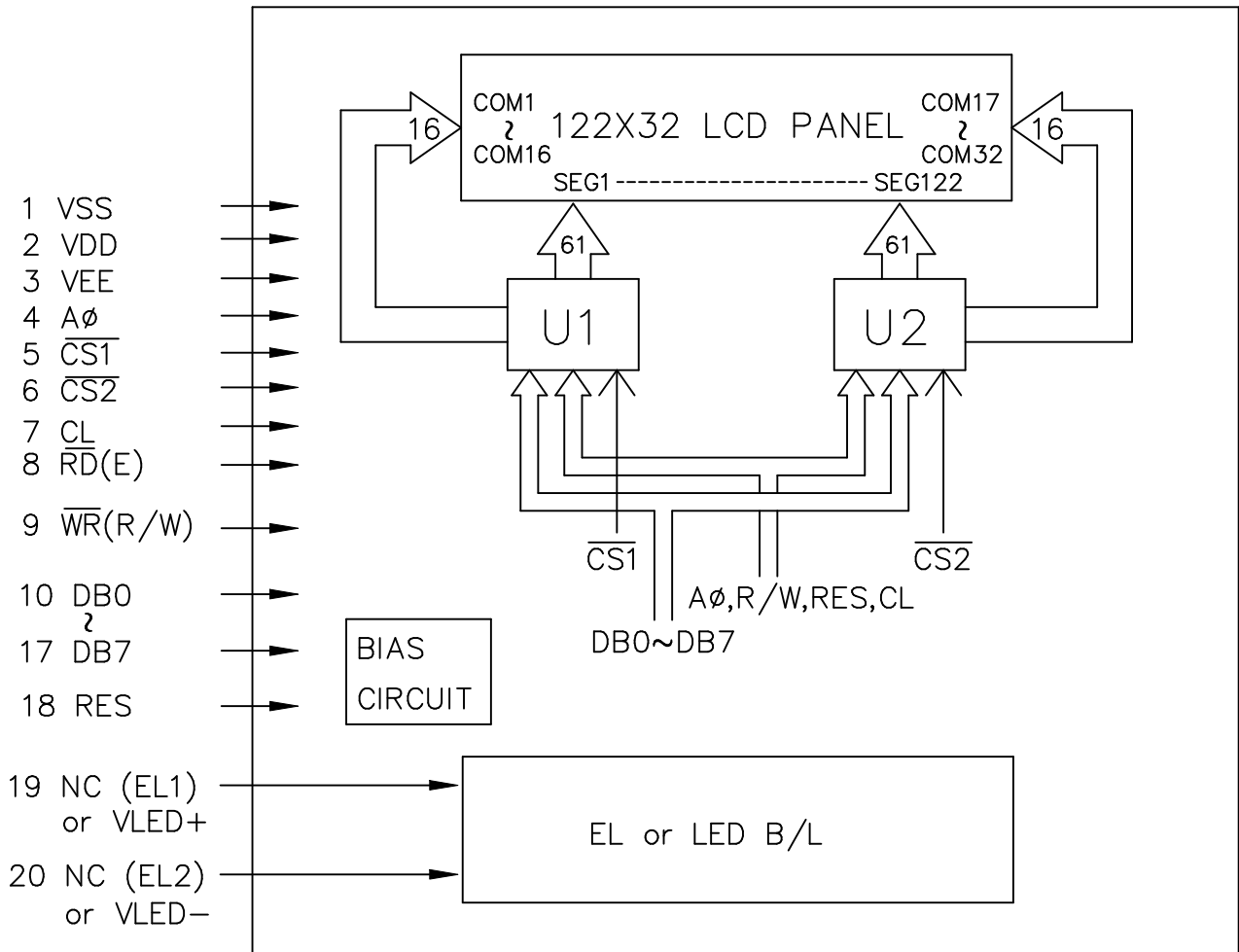
(negative type)

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

*Conditions

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

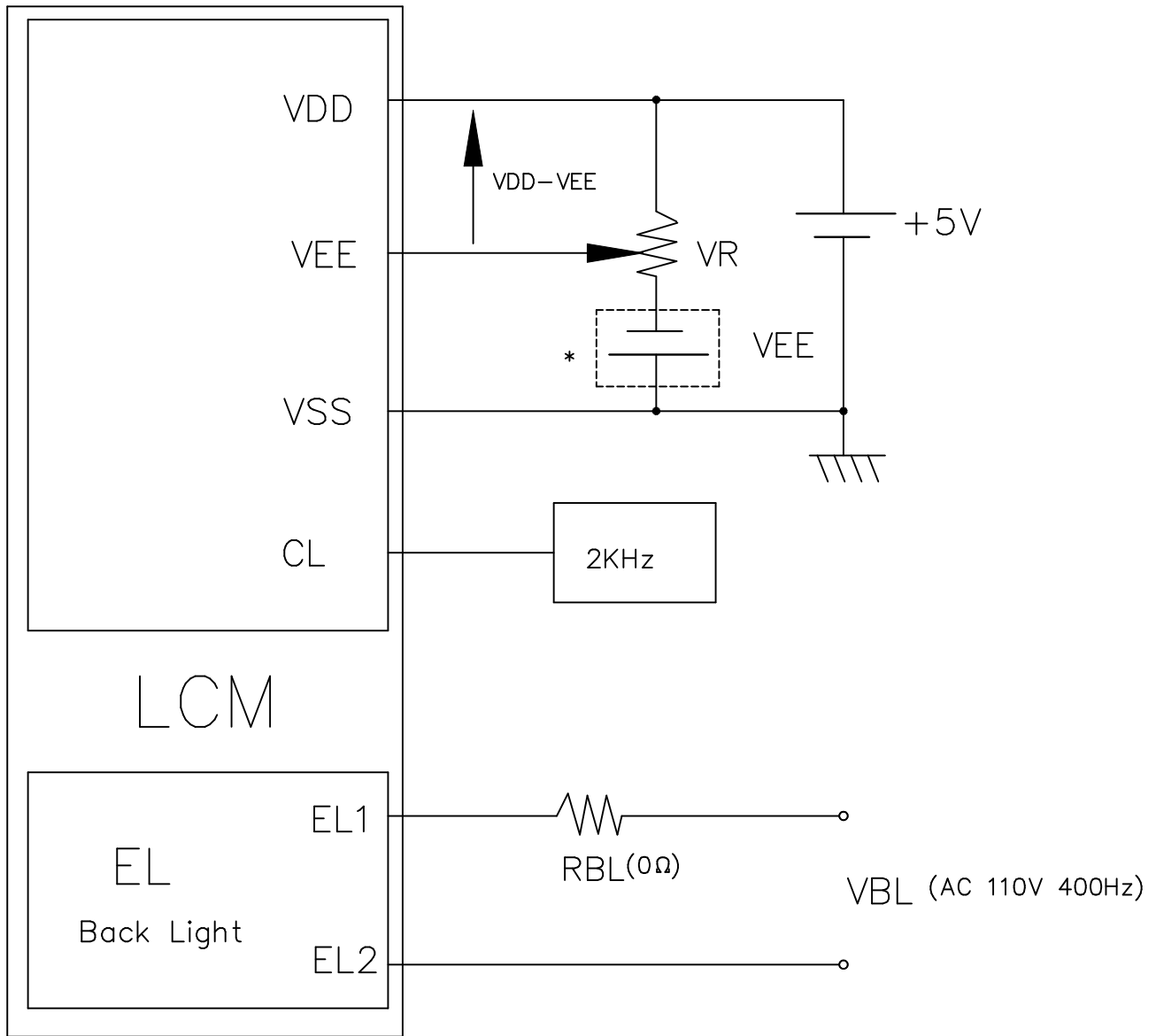
5. BLOCK DIAGRAM



6. INTERNAL PIN CONNECTION

PinNo.	Symbol	Level	Function
1	A \emptyset	H/L	L→INSTRUCTION H→DATA
2	$\overline{CS2}$	L	CHIP ENABLE ACTIVE "L"
3	$\overline{CS1}$	L	CHIP ENABLE ACTIVE "L"
4	CL	H/L	EXTERNAL CLOCK(2KHZ)
5	$\overline{RD}(E)$	—	\overline{RD} FOR 80 SERI, E FOR 68 SERI
6	$\overline{WR}(R/W)$	—	\overline{WR} FOR 80 SERI, R/W FOR 68 SERI
7	VSS	—	GROUND
8	DB0	H/L	DATA BUS LINE
9	DB1	H/L	
10	DB2	H/L	
11	DB3	H/L	
12	DB4	H/L	
13	DB5	H/L	
14	DB6	H/L	
15	DB7	H/L	
16	VDD	—	POWER SUPPLY FOR LOGIC CIRCUIT
17	RES	H/L	L→80 SERIES H→68 SERIES
18	VEE	—	POWER SUPPLY FOR LCD
19	NC (EL1)	—	NC (NO CONNECTION): FOR LMA62x042x13x
20	NC (EL2)	—	EL1,EL2 (POWER SUPPLY FOR EL): FOR LMD62x042x13x

7. POWER SUPPLY



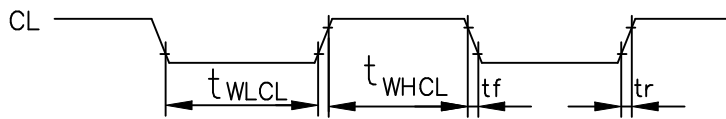
VR = 20KΩ (Variable)

* VEE = 5V

8. TIMING CHARACTERISTICS

8-1. Control timing for 80-port/68-port display

Item	Signal	Symbol	Condition	Min	Typ	Max	Unit
LOW pulse width	CL	tWLCL		35	-	-	μ s
HIGH pulse width		tWHCL		35	-	-	μ s
Rising time		tr		-	30	150	ns
Falling time		tf		-	30	150	ns

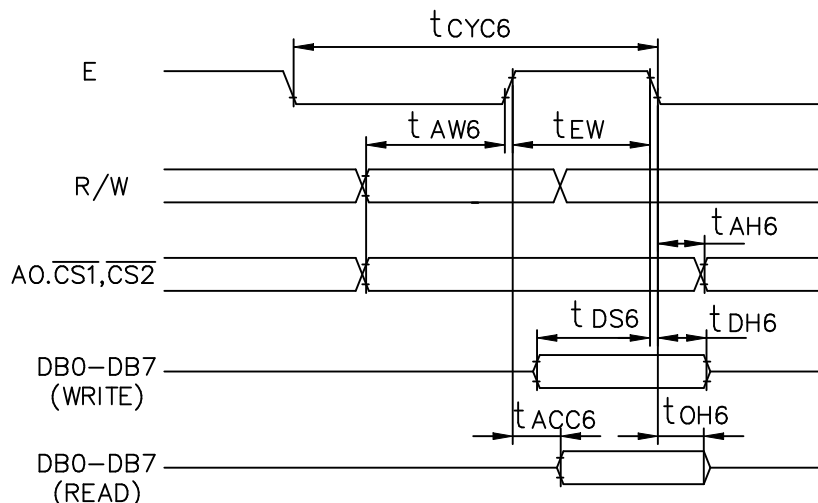


8-2. Read/write timing for the 68-port MPU

VDD=5V, Ta=-20~70°C

Item	Symbol	condition	Min.	Typ.	Max.	Unit
System cycle time (Note 1)	tCYC6		1000	-	-	ns
Address set-up time	tAW6		20	-	-	ns
Address hold time	tAH6		10	-	-	ns
Data set-up time	tDS6		80	-	-	ns
Data hold time	tDH6		10	-	-	ns
Output disable time	tOH6	CL=100pf	10	-	60	ns
Access time	tACC6		-	-	90	ns
Enable pulse width (Read)	tEW		100	-	-	ns
Enable pulse width (Write)			80	-	-	ns

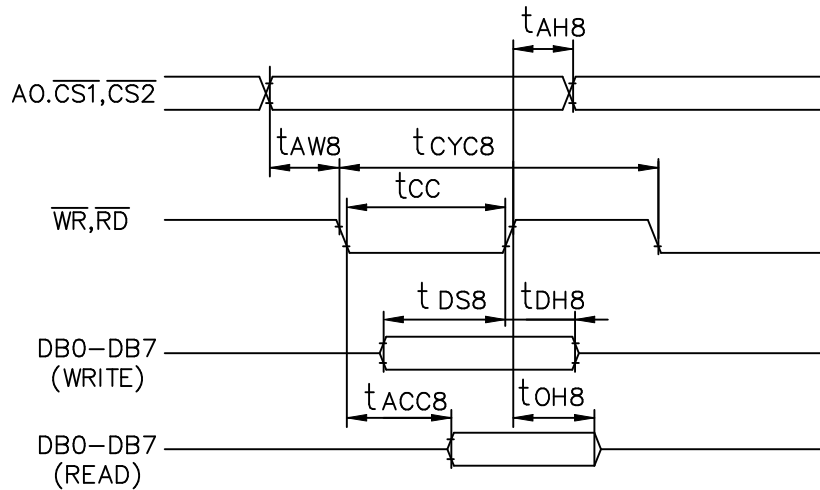
Note: 1.tCYC6 indicates the cycle during which \overline{CS}/E are HIGH; it does not indicate the cycle of the E signal.



8-3. Read/write timing for the 80-port MPU

VDD=5V, Ta=-20~70°C

Item	Symbol	condition	Min.	Typ.	Max.	Unit
Address hold time	tAH8		10	-	-	ns
Address set-up time	tAW8		20	-	-	ns
System cycle time	tCYC8		1000	-	-	ns
Control pulse width	tCC		200	-	-	ns
Data set-up time	tDS8		80	-	-	ns
Data hold time	tDH8		10	-	-	ns
\overline{RD} access time	tACC8	CL=100pf	-	-	90	ns
Output disable time	tOH8		10	-	60	ns



9. DISPLAY PATTERN

Page	DATA			Com NO.	Driver
0	D0 ----- D7	122 x 16 Pixels		1 ↓ 16	Master
1	D0 ----- D7				
2	D0 ----- D7	122 x 16 Pixels		17 ↓ 32	Slave
3	D0 ----- D7				
Column Addr.	ADC=0	00H → 3C	00H → 3C		
	Seg NO.	1 → 61	62 → 122		
	Driver	Master	Slave		

10. 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

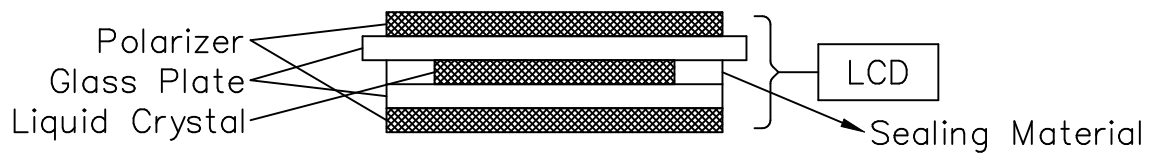
The NAN YA inspection provision provides outgoing inspection provision and its expected quality level based on our outgoing inspection of NAN YA LCD produces.

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.
(Per 1-1, 1-2 & 1-3)

4-1 Inspection Method

MIL-STD-105D Level II Regular inspection

4-2 Inspection Standard

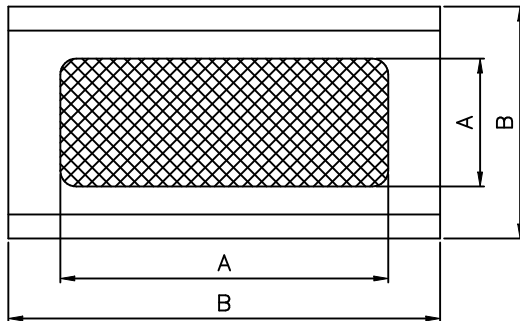
	Item		AQL(%)	Remarks
Major Defect	Dots	Opens Shorts Erroneous operation	0.4	faults which substantially lower the practicality and the initial purpose difficult to achieve.
	Solder appearance	Shorts Loose		
	Cracks	Display surface cracks		

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± 2°C
Humidity 65± 5%R.H..
Pressure 860~1060hPa(mmbar)

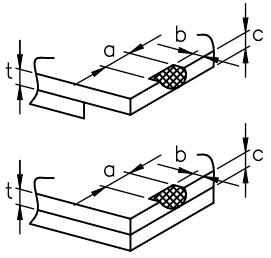
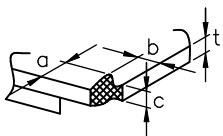
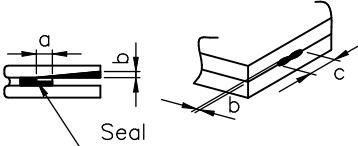
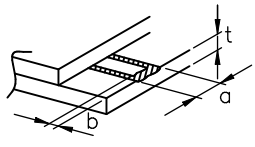
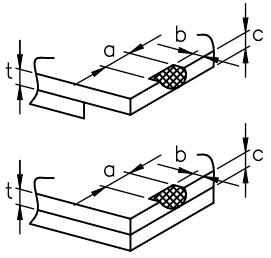
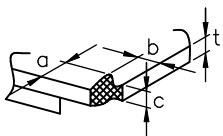
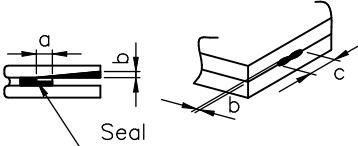
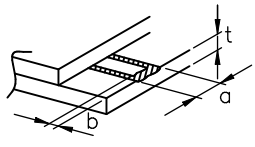
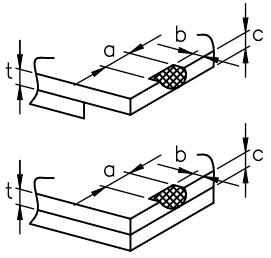
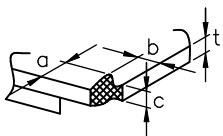
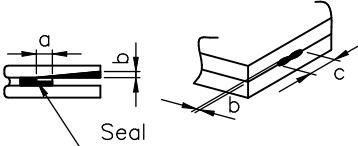
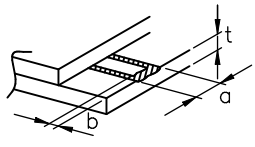
5.Specification for quality check
5-1 Electrical characteristics

NO.	Item	Criterion
1.	Non operational	Fail
2.	Miss operating	Fail
3.	Missing dot	Fail
4.	Contrast irregular	Not allowable
5.	Response time	Within Specified value
6.	backlight turn on/off	Within Specified value

5-2 External Appearance Defect

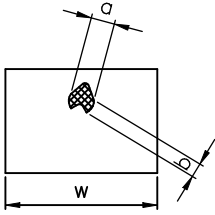
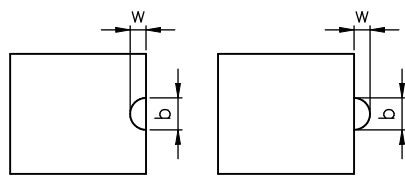
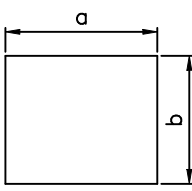
NO.	Item	Criterion																		
1.	Black spots, foreign matter, and white spots (Including light leakage due to pinholes of polarizing plates, etc.)	<p>(1)-1-Spots</p> <table border="1" data-bbox="711 477 1356 763"> <thead> <tr> <th>Average Diameter(mm):D</th> <th>Number of pieces permitted</th> </tr> </thead> <tbody> <tr> <td>$D \leq 0.1$</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-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>$D \leq 0.3$</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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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 705"> <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 1299"> <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
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$0.08 < W$	$3 < L$	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="710 376 1225 667"> <tr> <th data-bbox="710 376 970 521">Average Diameter (mm):D</th> <th data-bbox="970 376 1225 521">Number of pieces permitted</th> <th data-bbox="1225 376 1476 667" rowspan="2">Average diameter = (Long diameter + Short diameter)/2</th> </tr> <tr> <td data-bbox="710 521 970 667">D ≤ 0.3 0.3 < D</td> <td data-bbox="970 521 1225 667">Ignore 0</td> </tr> </table> <p data-bbox="710 683 1476 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 1476 1964"> <tr> <td data-bbox="662 779 1066 1169"> <p>(1) General crack</p>  </td> <td data-bbox="1066 779 1476 1169"> <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 1169 1066 1361"> <p>(2) Corner crack</p>  </td> <td data-bbox="1066 1169 1476 1361"> <p>a ≤ 2.5 b ≤ 2.5 c ≤ t a + b ≤ 4</p> </td> </tr> <tr> <td data-bbox="662 1361 1066 1630"> <p>(3) Seal portion crack</p>  </td> <td data-bbox="1066 1361 1476 1630"> <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 1630 1066 1870"> <p>(4) ITO Pin crack</p>  </td> <td data-bbox="1066 1630 1476 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 1476 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>										

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>

(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

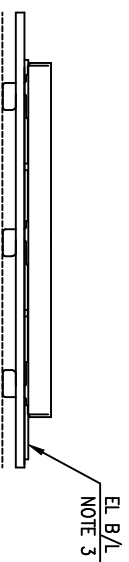
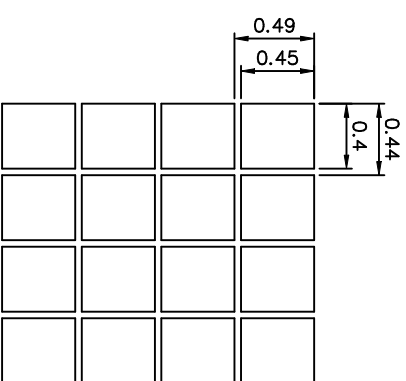
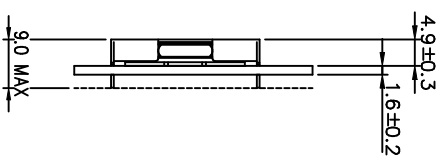
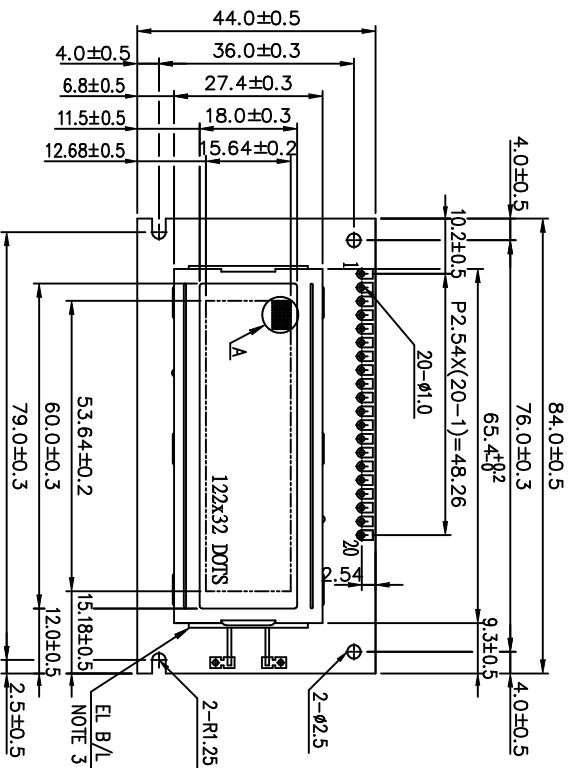
- 1.Store the panel or module in a dark place where the temperature is $25^{\circ}\text{C}\pm 5^{\circ}\text{C}$ and the humidity is below 65% RH.
- 2.Do not place the module near organics solvents or corrosive gases.
- 3.Do not crush, shake, or jolt the module.

• 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

- EL : 2000hrs for AC 110Vrms, 400Hz, 20°C, 60%RH
(Operating life time is defined as follows : The final brightness is at 50% of original brightness.)
- LED : 40,000hrs for ILED=100mA, 25°C
(Operating life time is defined as follows : The final brightness is at 50% of original brightness.)



- NOTE:
1. RESOLUTION : 122x32 DOTS
 2. NC (NO CONNECTION) : FOR LMD84X042X13X
 3. EL, EL2 (POWER SUPPLY FOR EL) : FOR LMD84X042X13X
 4. DRIVER IC : AK6120AA
 5. FRAME MATERIAL : SPCC (BLACK)

INTERNAL PIN CONNECTION

PIN NO.	SYMBOL	FUNCTION	PIN NO.	SYMBOL	FUNCTION
1	VSS	GROUND	11	DB1	
2	VDD	POWER SUPPLY FOR LOGIC CIRCUIT	12	DB2	
3	VBE	POWER SUPPLY FOR LCD	13	DB3	
4	A ϕ	L: INSTRUCTION H: DATA	14	DB4	DATA BUS LINE
5	CS1	CHIP ENABLE ACTIVE "L"	15	DB5	
6	CS2		16	DB6	
7	CL	EXTERNAL CLOCK (2KHZ)	17	DB7	
8	RD(E)	RD FOR 80 SERI, E FOR 68 SERI	18	RES	L: 80 SERIEL, H: 68 SERIEL
9	WR(R/W)	WR FOR 80 SERI, R/W FOR 68 SERI	19	NC (EL1)	
10	DB0	DATA BUS LINE	20	NC (EL2)	NOTE 2

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)

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

DWG NO.	DATE	SCALE	UNIT
M0142A1D13A	2009.06.15	1/1	mm

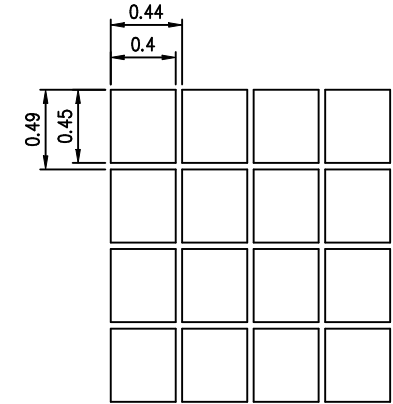
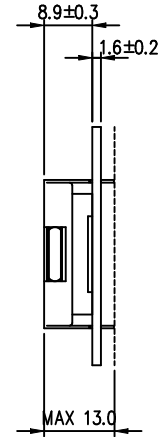
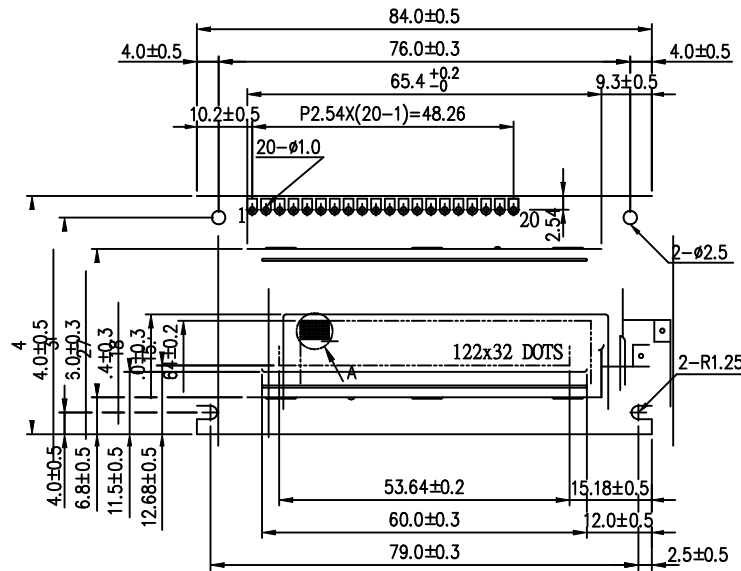
NAME	DATE	THIRD ANGLE P.
J.H. SUN	2009.06.15	☉

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

LMD84X042X13X

e-mail:
 lcd@admatec.de
 info@admatec.ch

web: www.admatec.com



A DETAIL
 S = 30:1



NOTE:

1. RESOLUTION : 122x32 DOTS
2. DRIVER IC : AX6120AA
3. BACK LIGHT : LED (YELLOW GREEN)
4. FRAME MATERIAL : SPOC (BLACK)

INTERNAL PIN CONNECTION

PIN NO.	SYMBOL	FUNCTION	PIN NO.	SYMBOL	FUNCTION
1	VSS	GROUND	11	DB1	DATA BUS LINE
2	VDD	POWER SUPPLY FOR LOGIC CIRCUIT	12	DB2	
3	VEE	POWER SUPPLY FOR LCD	13	DB3	
4	A ϕ	L: INSTRUCTION H: DATA	14	DB4	
5	CS1	CHIP ENABLE ACTIVE "L"	15	DB5	
6	CS2	CHIP ENABLE ACTIVE "L"	16	DB6	
7	CL	EXTERNAL CLOCK(2KHZ)	17	DB7	
8	RD(E)	RD FOR 80 SERI,E FOR 68 SERI	18	RES	L: 80 SERIEL H: 68 SERIEL
9	WR(R/W)	WR FOR 80 SERI,R/W FOR 68 SERI	19	VLED+	POWER SUPPLY FOR LED BACK LIGHT
10	DB0	DATA BUS LINE	20	VLED-	

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)



NAN YA PLASTICS CORPORATION

NLC-122x032-XXXX

REV. NO.	DESCRIPTION	DATE	DESIGN	CHECK	APPROVE	DWG NO.	SCALE	UNIT
1						M0142B13A	1/1	mm