

NAN YA PLASTICS CORPORATION

SPECIFICATION OF  
LCD MODULE  
PRODUCT NO.: LMBJ6N273S1DS\_

SPEC. NO.: LM273-1A-2

|             |
|-------------|
| CUSTOMER    |
|             |
| APPROVED BY |
|             |
| DATE:       |

LCD DEPARTMENT  
ELECTRONIC MATERIALS DIVISION  
NAN YA PLASTICS CORPORATION  
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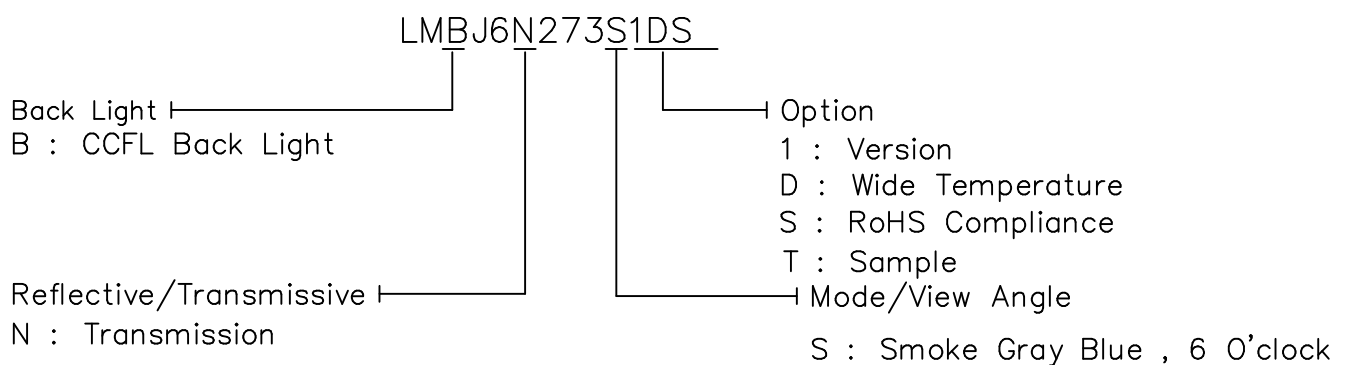
EDITED ON : MAY. 11, 2007

| DESIGN<br>MANAGER | DESIGN<br>MANAGER | DESIGN<br>CHECK | DESIGNER |
|-------------------|-------------------|-----------------|----------|
|                   |                   |                 | J.P Weng |

[illegible]

# 1.MECHANICAL DATA

| NO | ITEM              | CONTENTS                  | UNIT    |
|----|-------------------|---------------------------|---------|
| 1  | Product No.       | LMBJ6N273S1DS_            | —       |
| 2  | Module Size       | 180(W) X 65(H) X MAX20(D) | mm      |
| 3  | Dot Size          | 0.49 (W) x 0.49 (H)       | mm      |
| 4  | Dot Pitch         | 0.53 (W) x 0.53 (H)       | mm      |
| 5  | Number of Dots    | 240 (W) x 64 (H)          | Dot     |
| 6  | Duty              | 1/64                      | —       |
| 7  | LCD Display Mode  | STN, Smoke Gray Blue      | —       |
| 8  | Rear Polarizer    | Transmission              | —       |
| 9  | Viewing Direction | 6                         | O'clock |
| 10 | Backlight         | CCFL                      | —       |
| 11 | Weight            | 173(approx.)              | g       |
| 12 | Controller IC     | AX6963                    | —       |
| 13 | Soldering         | Lead Free                 | —       |



## 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.

|                                                                                                                  |                  |               |      |                 |                                                                  |                |
|------------------------------------------------------------------------------------------------------------------|------------------|---------------|------|-----------------|------------------------------------------------------------------|----------------|
| NAN YA PLASTICS CORP.<br>ELEC. MATERIALS DIV.<br>LCD DEPARTMENT                                                  |                  | SPECIFICATION |      |                 | SPEC. NO. : LM273-1A<br>DATE : NOV. 09, 2006<br>SHEET NO. : 2/25 |                |
| 2.ABSOLUTE MAXIMUM RATINGS                                                                                       |                  |               |      |                 |                                                                  |                |
| (1) ELECTRICAL ABSOLUTE RATINGS                                                                                  |                  |               |      | VSS=0V Standard |                                                                  |                |
| ITEM                                                                                                             | SYMBOL           | MIN           | MAX  | UNIT            | COMMENT                                                          |                |
| Power Supply for Logic                                                                                           | VCC-VSS          | -0.3          | 7.0  | V               |                                                                  |                |
| Power Supply for LCD                                                                                             | VCC-VLCD         | -0.3          | 15.0 | V               |                                                                  |                |
| Input Voltage                                                                                                    | VI               | -0.3          | VCC  | V               |                                                                  |                |
| Static Electricity                                                                                               | -                | -             | -    | -               | Note 1                                                           |                |
| Note 1 LCM should be grounded during handling LCM.                                                               |                  |               |      |                 |                                                                  |                |
| (2) ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS                                                                       |                  |               |      |                 |                                                                  |                |
| ITEM                                                                                                             | WIDE TEMP.       |               |      |                 |                                                                  |                |
|                                                                                                                  | OPERATING        |               |      | STORAGE         |                                                                  |                |
|                                                                                                                  | MIN.             | MAX.          |      | MIN.            | MAX.                                                             |                |
| Ambient Temperature                                                                                              | -20              | 70            |      | -40             | 80                                                               |                |
| Humidity (Without Condensation)                                                                                  | Note 2,4         |               |      | Note 3,4        |                                                                  |                |
| Note 2 Ta ≦ 70℃ : 75%RH max                                                                                      |                  |               |      |                 |                                                                  |                |
| Note 3 Please refer to item of reliability test                                                                  |                  |               |      |                 |                                                                  |                |
| Note 4 Background color will change slightly depending on ambient temperature.<br>That phenomenon is reversible. |                  |               |      |                 |                                                                  |                |
| REV/DATE                                                                                                         | R0/<br>11.09.06' |               |      |                 |                                                                  | BY<br>J.P Weng |

|                                                                 |               |                                                                  |
|-----------------------------------------------------------------|---------------|------------------------------------------------------------------|
| NAN YA PLASTICS CORP.<br>ELEC. MATERIALS DIV.<br>LCD DEPARTMENT | SPECIFICATION | SPEC. NO. : LM273-1A<br>DATE : NOV. 09, 2006<br>SHEET NO. : 3/25 |
|-----------------------------------------------------------------|---------------|------------------------------------------------------------------|

### 3.ELECTRICAL CHARACTERISTICS

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

| ITEM                                                  |                      | SYMBOL                                                      | CONDITION                                                               | MIN.   | TYP. | MAX.   | UNIT              |
|-------------------------------------------------------|----------------------|-------------------------------------------------------------|-------------------------------------------------------------------------|--------|------|--------|-------------------|
| Power Supply for Logic                                |                      | VCC                                                         | Ta=25°C                                                                 | 4.5    | 5.0  | 5.5    | V                 |
| Input Voltage                                         |                      | VIH                                                         | H level                                                                 | 0.7VCC | —    | VCC    | V                 |
|                                                       |                      | VIO                                                         | L level                                                                 | 0      | —    | 0.3VCC | V                 |
| Recommended<br>LC Driving Voltage<br>(Wide Temp. LCM) |                      | VCC-VLCD<br>(Vop)                                           | Duty=1/64                                                               | -20°C  | 12.0 | 12.3   | V                 |
|                                                       |                      |                                                             |                                                                         | 0°C    | 11.8 | 12.1   |                   |
|                                                       |                      |                                                             |                                                                         | 25°C   | 11.7 | 12.0   |                   |
|                                                       |                      |                                                             |                                                                         | 50°C   | 11.4 | 11.7   |                   |
|                                                       |                      |                                                             |                                                                         | 70°C   | 11.1 | 11.4   |                   |
| Power Supply Current                                  |                      | IDD                                                         | FLM=70 Hz<br>VCC=5.0 V<br>VCC-VLCD=12 V<br>Ta=25°C                      | —      | 14.5 | 21     | mA                |
|                                                       |                      | IEE                                                         | PATTERN :<br><div> <div>□ ■ □ ■ □ ■</div> <div>■ □ ■ □ ■ □</div> </div> | —      | 7.5  | 12     |                   |
| LCM                                                   | Surface<br>Luminance | Ta=25°C<br>Inverter:<br>TDK CXA-L10L<br>Vin=11.3V<br>IL=5mA | PATTERN:<br>(Dots All Off)                                              | —      | 50   | —      | cd/m <sup>2</sup> |
|                                                       |                      |                                                             | PATTERN:<br>(Dots All On)                                               | 160    | 200  | —      |                   |

|          |                  |                  |  |  |  |                |
|----------|------------------|------------------|--|--|--|----------------|
| REV/DATE | R0/<br>11.09.06' | R1/<br>12.29.06' |  |  |  | BY<br>J.P Weng |
|----------|------------------|------------------|--|--|--|----------------|

|                                                                                                                                                                             |                  |               |      |                          |       |                                                                  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------|------|--------------------------|-------|------------------------------------------------------------------|--|
| NAN YA PLASTICS CORP.<br>ELEC. MATERIALS DIV.<br>LCD DEPARTMENT                                                                                                             |                  | SPECIFICATION |      |                          |       | SPEC. NO. : LM273-1A<br>DATE : NOV. 09, 2006<br>SHEET NO. : 4/25 |  |
| 3-2.ELECTRICAL CHARACTERISTICS OF BACKLIGHT                                                                                                                                 |                  |               |      |                          |       |                                                                  |  |
| Used CCFL Rating                                                                                                                                                            |                  |               |      | Temp.=25℃                |       |                                                                  |  |
| ITEM                                                                                                                                                                        | SYMBOL           | MIN.          | TYP. | MAX.                     | UNIT  | REMARK                                                           |  |
| Lamp voltage                                                                                                                                                                | V <sub>L</sub>   | —             | 382  | —                        | Vrms  | —                                                                |  |
| Lamp current                                                                                                                                                                | I <sub>L</sub>   | 3.0           | 5.0  | 6.0                      | mArms | —                                                                |  |
| Lamp power consumption                                                                                                                                                      | P <sub>L</sub>   | —             | 2.1  | —                        | W     | (*1)                                                             |  |
| Starting voltage                                                                                                                                                            | V <sub>S</sub>   | —             | —    | 900                      | Vrms  | At 25℃                                                           |  |
|                                                                                                                                                                             |                  | —             | —    | 1170                     | Vrms  | At 0℃                                                            |  |
| Lamp life time                                                                                                                                                              | L <sub>L</sub>   | 40000         | —    | —                        | hrs   | I <sub>L</sub> = 5.0mArms(*2)                                    |  |
| (*1) Power consumption excluded inverter loss .                                                                                                                             |                  |               |      |                          |       |                                                                  |  |
| (*2) Lamp life time is defined as follows : The final brightness is at 50% of original brightness .                                                                         |                  |               |      |                          |       |                                                                  |  |
| (*3) a. Please follow the table of Lamp Characteristics shown above if not to use the inverter recommended by Nan Ya .                                                      |                  |               |      |                          |       |                                                                  |  |
| b. If customers want to design inverter by themselves , please inform Nan Ya to offer the detail lamp specification .                                                       |                  |               |      |                          |       |                                                                  |  |
| 3-3.ELECTRICAL CHARACTERISTICS OF RECOMMENDED INVERTER                                                                                                                      |                  |               |      |                          |       |                                                                  |  |
| TDK CXA-L10L                                                                                                                                                                |                  |               |      |                          |       |                                                                  |  |
| 3-3-1 GENERAL SPECIFICATIONS                                                                                                                                                |                  |               |      |                          |       |                                                                  |  |
| OPERATION TEMPERATURE : -10℃~60℃                                                                                                                                            |                  |               |      |                          |       |                                                                  |  |
| STORAGE TEMPERATURE : -20℃~85℃                                                                                                                                              |                  |               |      |                          |       |                                                                  |  |
| DIMENSION : 56.0(L)mm x 29.0(W)mm x MAX 19.5(H)mm                                                                                                                           |                  |               |      |                          |       |                                                                  |  |
| 3-3-2 PIN ASSIGNMENTS                                                                                                                                                       |                  |               |      |                          |       |                                                                  |  |
| INPUT (CN1) CONNECTOR :                                                                                                                                                     |                  |               |      | OUTPUT (CN2) CONNECTOR : |       |                                                                  |  |
| NO.                                                                                                                                                                         |                  | FUNCTION      |      | NO.                      |       | FUNCTION                                                         |  |
| 1                                                                                                                                                                           |                  | VIN           |      | 3                        |       | OUT1                                                             |  |
| 2                                                                                                                                                                           |                  | GND           |      | 4                        |       | OUT2                                                             |  |
|                                                                                                                                                                             |                  |               |      | 5                        |       | OUT GND                                                          |  |
| 3-3-3 RELATIONSHIP BETWEEN VIN & TUBE CURRENT                                                                                                                               |                  |               |      |                          |       |                                                                  |  |
| ITEM                                                                                                                                                                        | SYMBOL           | MIN.          | TYP. | MAX.                     | UNIT  | REMARK                                                           |  |
| Input Voltage                                                                                                                                                               | VIN              | —             | 11.3 | —                        | V     |                                                                  |  |
| Tube Current                                                                                                                                                                | IL               | —             | 5    | —                        | mA    |                                                                  |  |
| Note : Inverter must be used in the range of VIN Input Voltage.<br>If it doesn't used in this range, the electrical characteristics of backlight would not be to guarantee. |                  |               |      |                          |       |                                                                  |  |
| REV/DATE                                                                                                                                                                    | R0/<br>11.09.06' |               |      |                          |       | BY<br>J.P Weng                                                   |  |

## 4.OPTICAL CHARACTERISTICS

AT Vop

| ITEM<br>MODE |   | Cr(Contrast Ratio) |      |      |      |      |      |      |      |      |      | θ(Viewing Angle) |                | θ(Viewing Angle) |      |
|--------------|---|--------------------|------|------|------|------|------|------|------|------|------|------------------|----------------|------------------|------|
|              |   | -20℃               |      | 0℃   |      | 25℃  |      | 50℃  |      | 70℃  |      | 25℃              |                | 25℃              |      |
|              |   | MIN.               | TYP. | MIN. | TYP. | MIN. | TYP. | MIN. | TYP. | MIN. | TYP. | MIN.             | TYP.           | MIN.             | TYP. |
| N            | S | 4.5                | 5.0  | 5.0  | 5.5  | 5.5  | 7.0  | 4.0  | 5.0  | 2.0  | 2.5  | —                | F: 40<br>R: 30 | —                | ±35  |
| Note         |   | NOTE 6             |      |      |      |      |      |      |      |      |      | NOTE 5           |                |                  |      |

Note:

N : Transmission

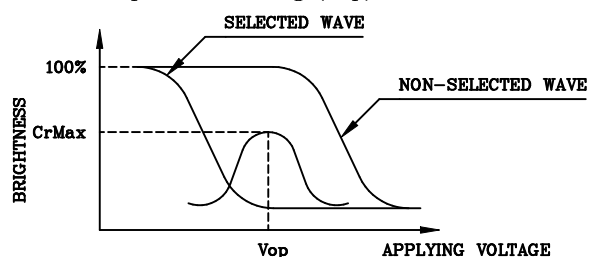
S : Smoke Gray (Blue), 6 O'Clock

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

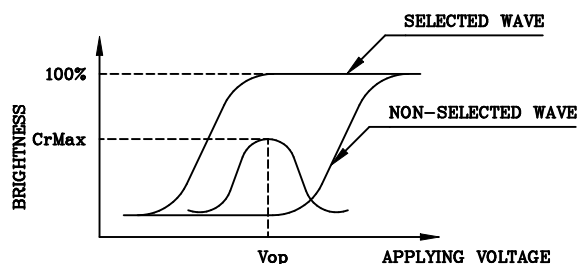
| ITEM                 | SYMBOL | CONDITION | MIN. | TYP. | MAX. | UNIT | NOTE   |
|----------------------|--------|-----------|------|------|------|------|--------|
| Response Time (rise) | Tr     | -20℃      | 760  | 950  | 1450 | mS   | NOTE 2 |
|                      |        | 0℃        | 160  | 200  | 300  |      |        |
|                      |        | 25℃       | 70   | 80   | 120  |      |        |
|                      |        | 50℃       | 50   | 60   | 110  |      |        |
|                      |        | 70℃       | 35   | 40   | 60   |      |        |
| Response Time (fall) | Tf     | -20℃      | 1050 | 1300 | 1950 | mS   | NOTE 2 |
|                      |        | 0℃        | 670  | 820  | 1250 |      |        |
|                      |        | 25℃       | 150  | 170  | 260  |      |        |
|                      |        | 50℃       | 50   | 60   | 90   |      |        |
|                      |        | 70℃       | 35   | 40   | 60   |      |        |

(NOTE 1)

Definition of Operation Voltage(Vop)



(positive type)



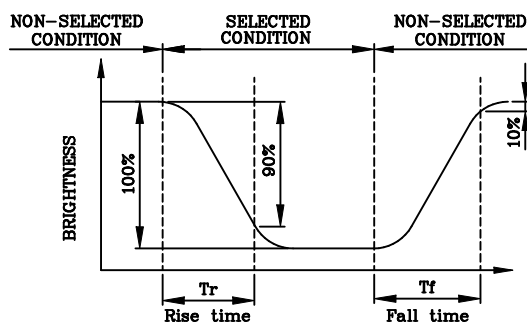
(negative type)

\*Conditions

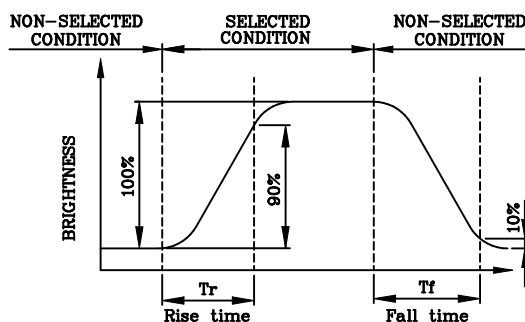
Viewing Angle : 0  
Frame Frequency : 70Hz  
Applying Waveform : 1/N duty 1/a bias

(NOTE 2)

Definition of Response Time(Tr,Tf)



(positive type)



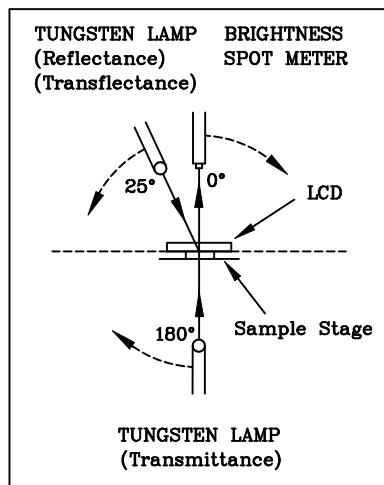
(negative type)

\*Conditions

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

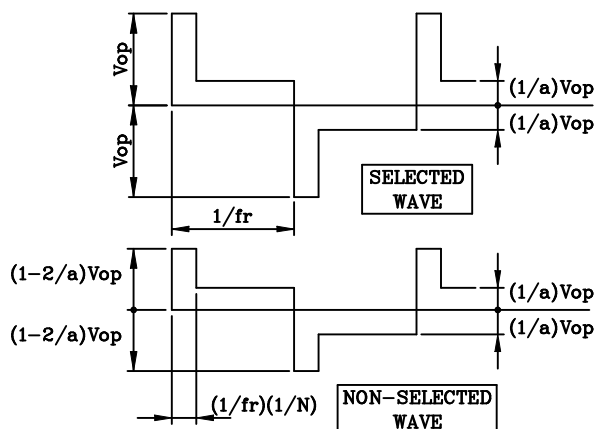
(NOTE 3)

Description of Measuring Equipment and Driving Waveforms



CONST.  
TEMP.  
CHAMBER

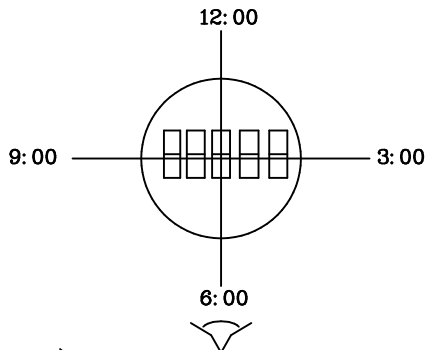
Multiplex Driving ( 1/N duty 1/a bias )





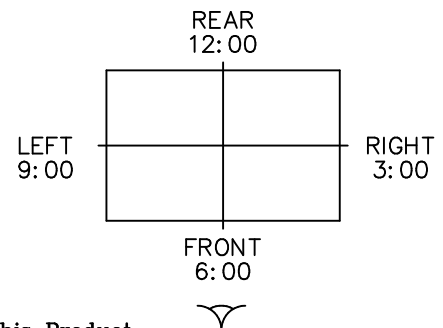
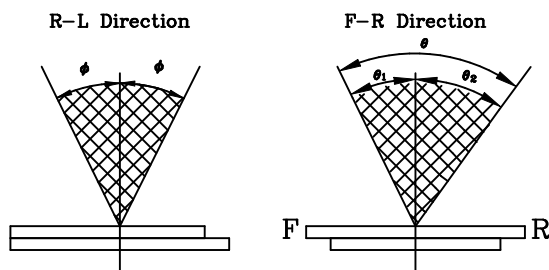
(NOTE 4)

Definition of Viewing Direction



(NOTE 5)

Definition of Viewing Angle



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

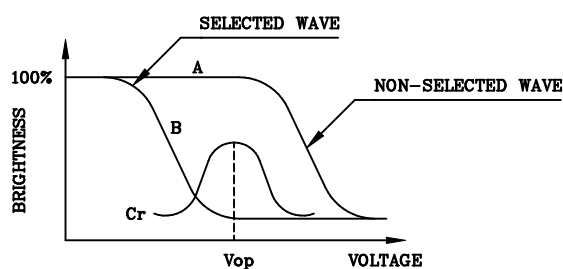
$$\theta = \theta_1 + \theta_2$$

\*Conditions

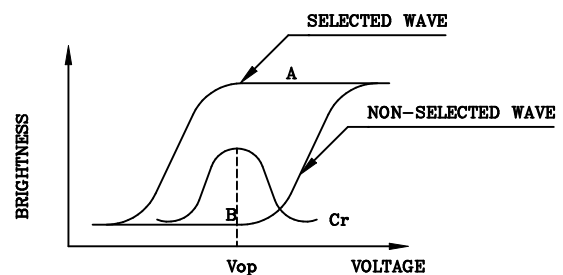
Operating Voltage : Vop  
Frame Frequency : 70Hz  
Applying Waveform : 1/N duty 1/a bias  
Contrast Ratio : larger than 2

(NOTE 6)

Definition of Contrast Ratio (Cr)



(positive type)



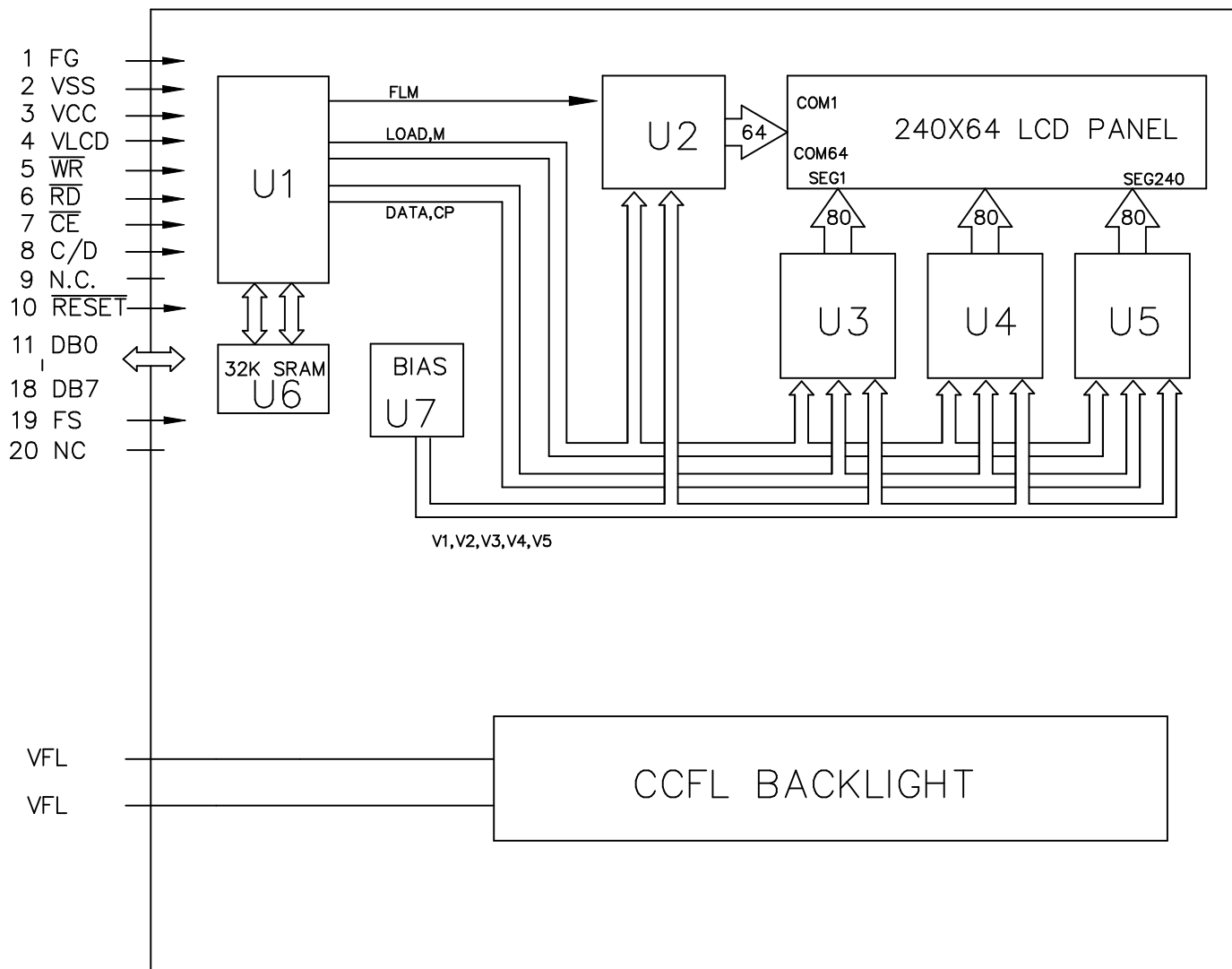
(negative type)

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

\*Conditions

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

## 5. BLOCK DIAGRAM



## 6.INTERNAL PIN CONNECTION

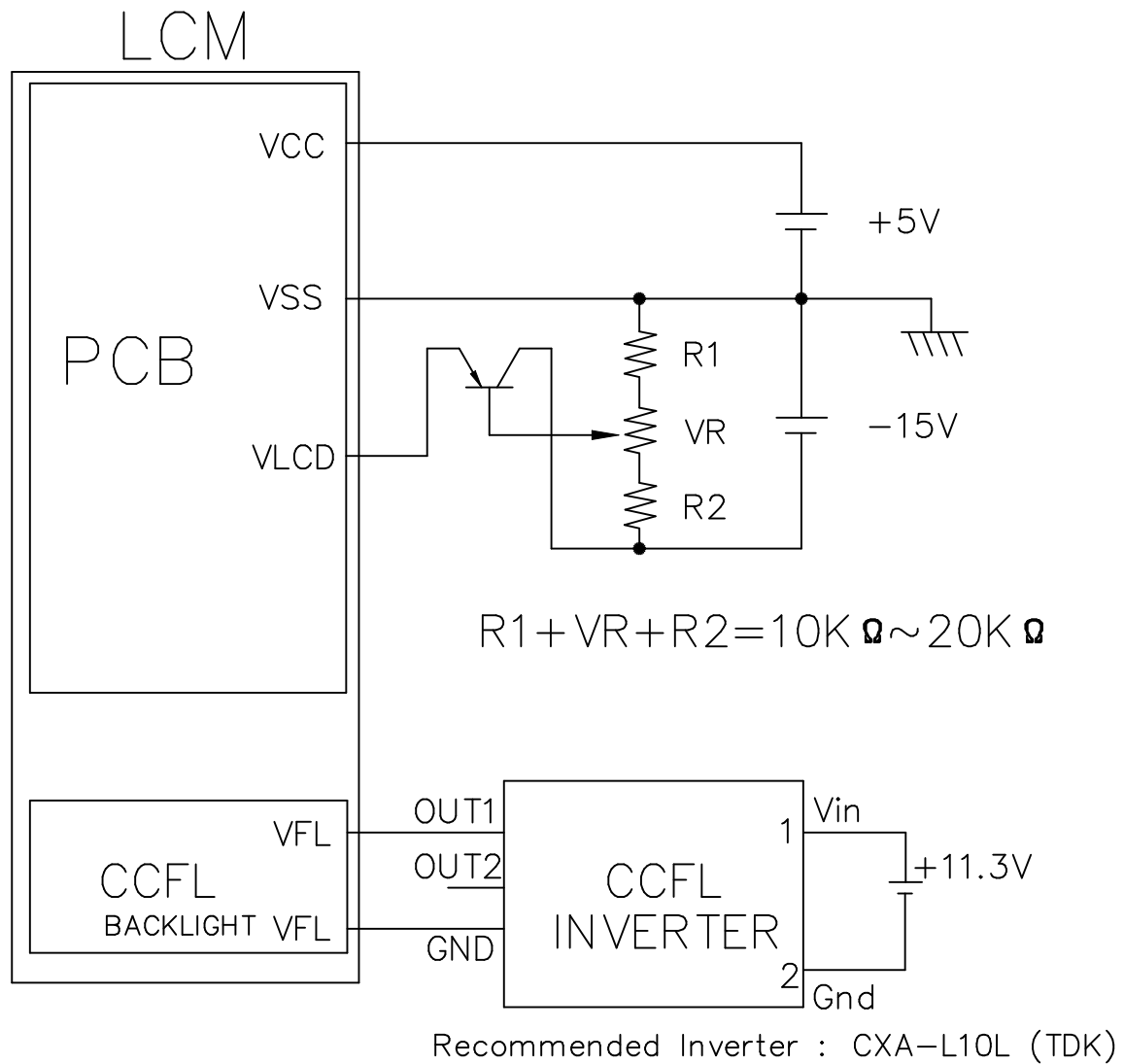
CN1 : Pitch 2.54 mm

| Pin No. | Symbol             | Function                           |
|---------|--------------------|------------------------------------|
| 1       | FG                 | Frame Ground                       |
| 2       | VSS                | Ground (0V)                        |
| 3       | VCC                | Power Supply for Logic Circuit (+) |
| 4       | VLCD               | LCD Drive Voltage (-)              |
| 5       | $\overline{WR}$    | Write Data                         |
| 6       | $\overline{RD}$    | Read Data                          |
| 7       | $\overline{CE}$    | Chip Enable                        |
| 8       | C/D                | Code / Data                        |
| 9       | NC                 | No Connection                      |
| 10      | $\overline{RESET}$ | Reset Active "L"                   |
| 11      | DB0                | Data Bus Line                      |
| 12      | DB1                |                                    |
| 13      | DB2                |                                    |
| 14      | DB3                |                                    |
| 15      | DB4                |                                    |
| 16      | DB5                |                                    |
| 17      | DB6                |                                    |
| 18      | DB7                |                                    |
| 19      | FS                 | Font Select H : 6 × 8 ; L : 8 × 8  |
| 20      | NC                 | No Connection                      |

CCFL : Pitch 3.96mm (H8800 Series Housings)  
Mating Connector : P8800I or P8800L Series

| Pin No. | Symbol | Function                    |
|---------|--------|-----------------------------|
| 1       | HOT    | Power Supply for CCFL (HOT) |
| 2       | NC     | No Connection               |
| 3       | NC     | No Connection               |
| 4       | GND    | Power Supply for CCFL (GND) |

## 7. POWER SUPPLY



## 8. TIMING CHARACTERISTICS

### 8-1 INTERFACE TIMING

@VCC = 5V±10%

| ITEM                                                            | ITEM                     | CONDITION | MIN. | MAX. | UNIT |
|-----------------------------------------------------------------|--------------------------|-----------|------|------|------|
| C/D SET UP TIME                                                 | $t_{CDS}$                | Fig.      | 100  | —    | ns   |
| C/D HOLD TIME                                                   | $t_{CDH}$                | Fig.      | 10   | —    | ns   |
| $\overline{CE}$ , $\overline{RD}$ , $\overline{WR}$ CLOCK WIDTH | $t_{CP}, t_{RP}, t_{WP}$ | Fig.      | 80   | —    | ns   |
| DATA SET UP TIME                                                | $t_{DS}$                 | Fig.      | 80   | —    | ns   |
| DATA HOLD TIME                                                  | $t_{DH}$                 | Fig.      | 40   | —    | ns   |
| ACCESS TIME                                                     | $t_{ACC}$                | Fig.      | —    | 150  | ns   |
| DATA OUTPUT HOLD TIME                                           | $t_{OH}$                 | Fig.      | 10   | 50   | ns   |

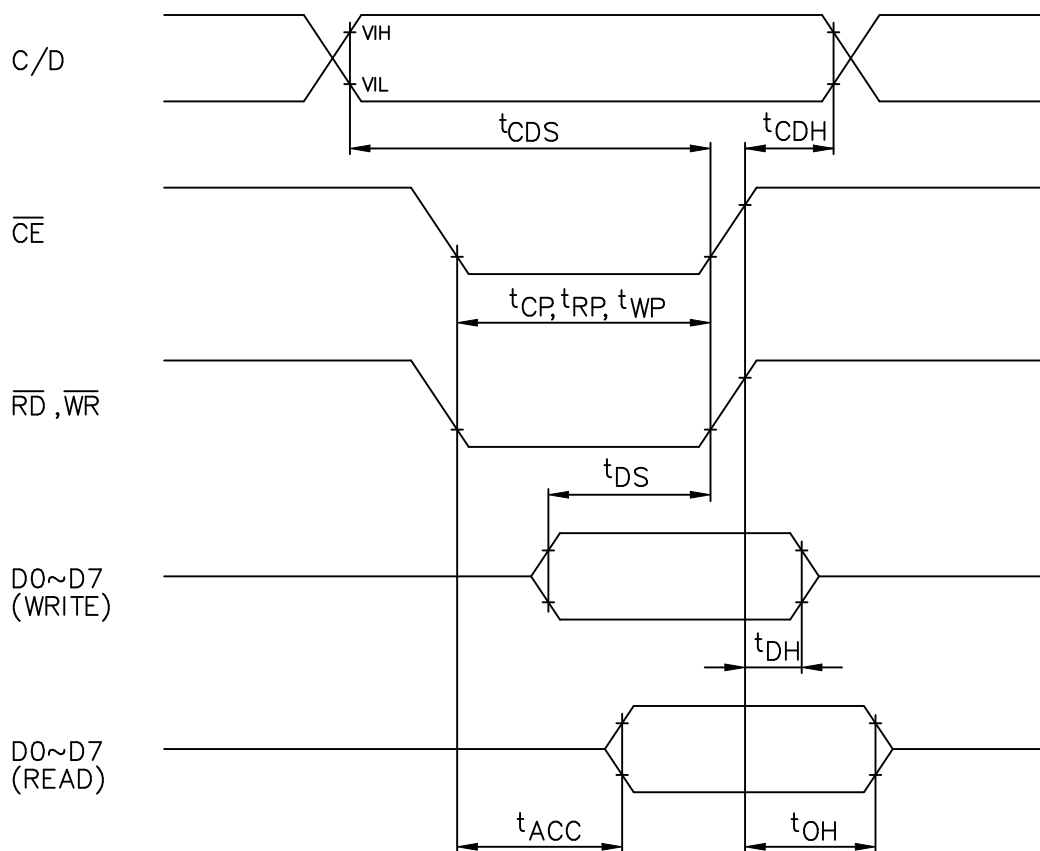
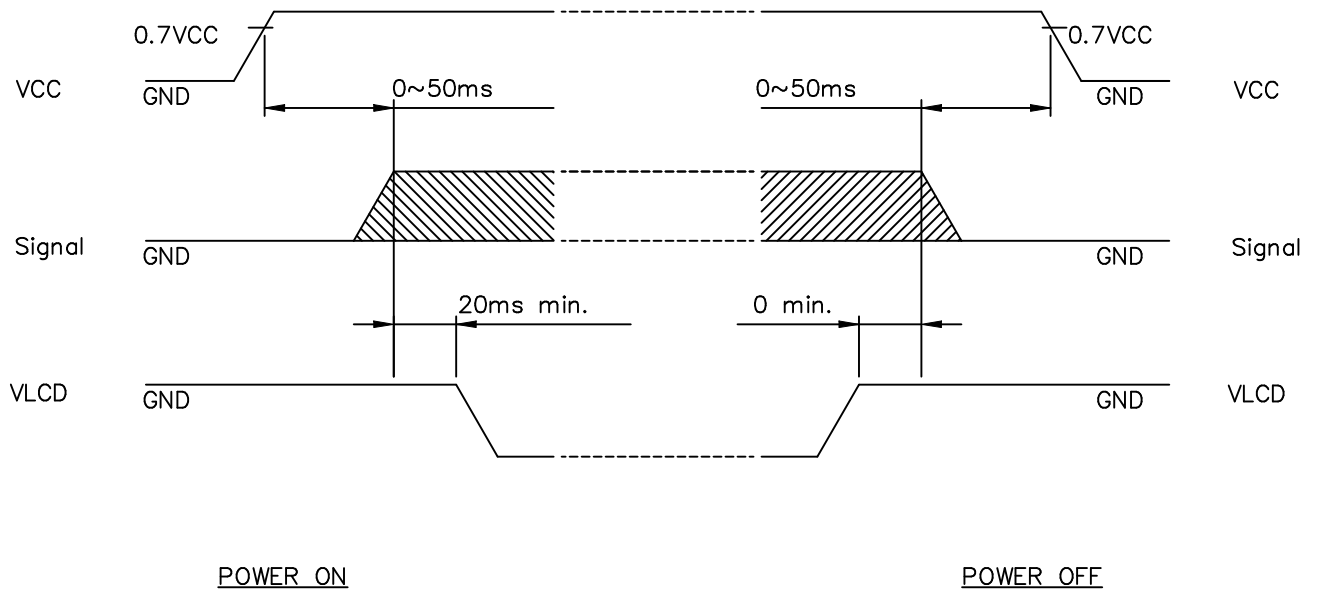


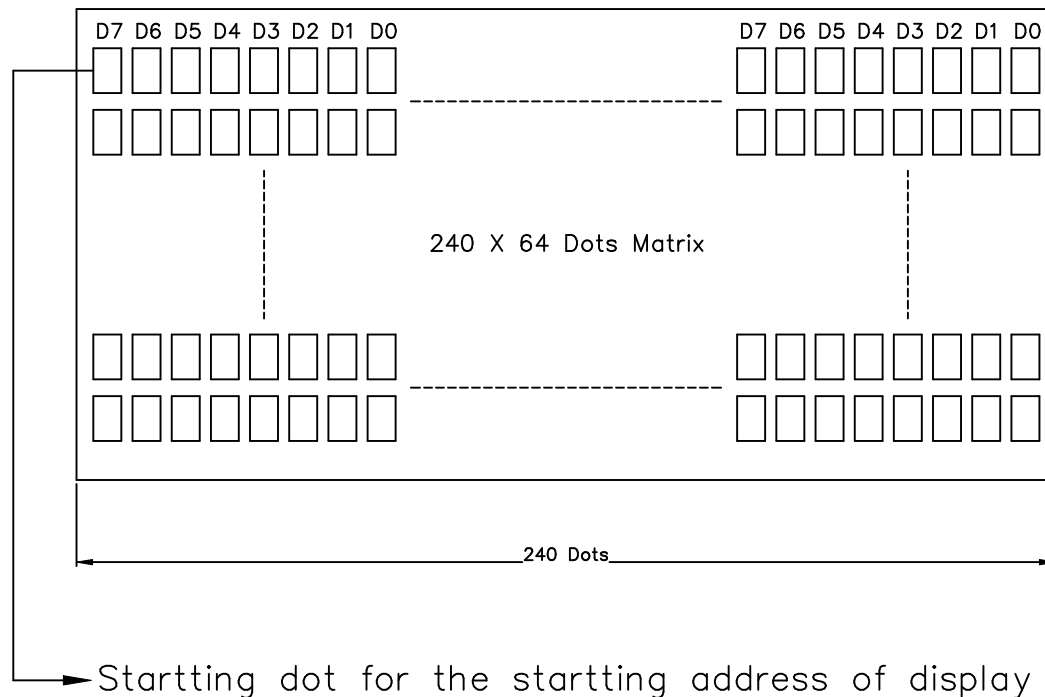
Fig. INTERFACE TIMING CHART

## 8-2 POWER ON/OFF TIMING



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

## 8-3 DISPLAY PATTERN



D0~D7 are 8 bits transmitted data, where D0 is LSB and D7 is MSB.

|                                                                 |          |               |              |                                                                   |
|-----------------------------------------------------------------|----------|---------------|--------------|-------------------------------------------------------------------|
| NAN YA PLASTICS CORP.<br>ELEC. MATERIALS DIV.<br>LCD DEPARTMENT |          | SPECIFICATION |              | SPEC. NO. : LM273-1A<br>DATE : NOV. 09, 2006<br>SHEET NO. : 14/25 |
| 8-4.COMMAND LIST                                                |          |               |              |                                                                   |
| COMMAND                                                         | CODE     | D1            | D2           | FUNCTION                                                          |
| REGISTER SET                                                    | 00100001 | X address     | X address    | Cursor pointer set                                                |
|                                                                 | 00100010 | Data          | OOH          | Offset register set                                               |
|                                                                 | 00100100 | Low address   | High address | Address pointer set                                               |
| CONTROL WORD SET                                                | 01000000 | Low address   | High address | Text home address set                                             |
|                                                                 | 01000001 | Columns       | OOH          | Text area set                                                     |
|                                                                 | 01000010 | Low address   | High address | Graphic home address set                                          |
|                                                                 | 01000011 | Columns       | OOH          | Graphic area set                                                  |
| MODE SET                                                        | 1000X000 | —             | —            | "OR" mode                                                         |
|                                                                 | 1000X001 | —             | —            | "EXOR" mode                                                       |
|                                                                 | 1000X011 | —             | —            | "AND" mode                                                        |
|                                                                 | 1000X100 | —             | —            | "Text attribute" mode                                             |
|                                                                 | 10000XXX | —             | —            | Internal CG ROM mode                                              |
|                                                                 | 10001XXX | —             | —            | External CG RAM mode                                              |
| DISPLAY MODE                                                    | 10010000 | —             | —            | Display off                                                       |
|                                                                 | 1001XX10 | —             | —            | Cursor on, blink off                                              |
|                                                                 | 1001XX11 | —             | —            | Cursor on, blink on                                               |
|                                                                 | 100101XX | —             | —            | Text on, graphic off                                              |
|                                                                 | 100110XX | —             | —            | Text off, graphic on                                              |
|                                                                 | 100111XX | —             | —            | Text on, graphic on                                               |
| CURSOR PATTERN SELECT                                           | 10100000 | —             | —            | 1 line cursor                                                     |
|                                                                 | 10100001 | —             | —            | 2 lines cursor                                                    |
|                                                                 | 10100010 | —             | —            | 3 lines cursor                                                    |
|                                                                 | 10100011 | —             | —            | 4 lines cursor                                                    |
|                                                                 | 10100100 | —             | —            | 5 lines cursor                                                    |
|                                                                 | 10100101 | —             | —            | 6 lines cursor                                                    |
|                                                                 | 10100110 | —             | —            | 7 lines cursor                                                    |
|                                                                 | 10100111 | —             | —            | 8 lines cursor                                                    |
| DATA AUTO READ/WRITE                                            | 10110000 | —             | —            | Data auto write set                                               |
|                                                                 | 10110001 | —             | —            | Data auto read set                                                |
|                                                                 | 10110010 | —             | —            | Auto reset                                                        |
| DATA READ WRITE                                                 | 11000000 | Data          | —            | Data write and ADP increment                                      |
|                                                                 | 11000001 | —             | —            | Data read and ADP increment                                       |
|                                                                 | 11000010 | Data          | —            | Data write and ADP decrement                                      |
|                                                                 | 11000011 | —             | —            | Data read and ADP decrement                                       |
|                                                                 | 11000100 | Data          | —            | Data write and ADP nonvariable                                    |
|                                                                 | 11000101 | —             | —            | Data read and ADP nonvariable                                     |
| SCREEN PEEK                                                     | 11100000 | —             | —            | Screen peek                                                       |
| SCREEN COPY                                                     | 11101000 |               |              | Screen copy                                                       |
| BIT SET/RESET                                                   | 11110XXX | —             | —            | bit reset                                                         |
|                                                                 | 11111XXX | —             | —            | bit set                                                           |
|                                                                 | 1111X000 | —             | —            | bit0(LSB)                                                         |
|                                                                 | 1111X001 | —             | —            | bit1                                                              |
|                                                                 | 1111X010 | —             | —            | bit2                                                              |
|                                                                 | 1111X011 | —             | —            | bit3                                                              |
|                                                                 | 1111X100 | —             | —            | bit4                                                              |
|                                                                 | 1111X101 | —             | —            | bit5                                                              |
|                                                                 | 1111X110 | —             | —            | bit6                                                              |
|                                                                 | 1111X111 | —             | —            | bit7(MSB)                                                         |

|          |                  |  |  |  |  |                |
|----------|------------------|--|--|--|--|----------------|
| REV/DATE | R0/<br>11.09.06' |  |  |  |  | BY<br>J.P Weng |
|----------|------------------|--|--|--|--|----------------|



## \* STATUS READ

Before sending data (read/write), command it is necessary to check the status.

AX6963 status word format is following :

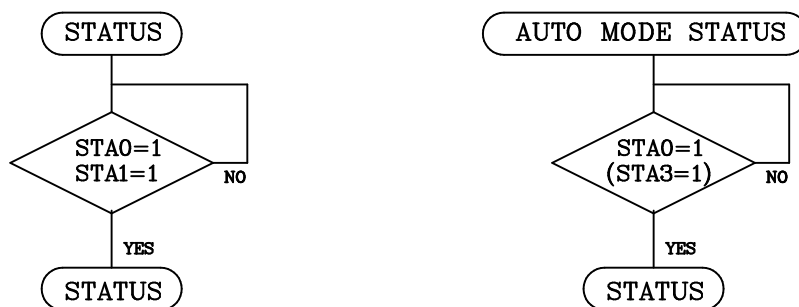
|     |    |      |                                            |                         |
|-----|----|------|--------------------------------------------|-------------------------|
| LSB | D0 | STA0 | Check capability of command execution      | 0: Disable<br>1: Enable |
|     | D1 | STA1 | Check capability of data read/write        | 0: Disable<br>1: Enable |
|     | D2 | STA2 | Check capability of auto mode data read    | 0: Disable<br>1: Enable |
|     | D3 | STA3 | Check capability of auto mode data write   | 0: Disable<br>1: Enable |
|     | D4 | STA4 | Not use                                    |                         |
|     | D5 | STA5 | Check capability of controller operation   | 0: Disable<br>1: Enable |
| MSB | D6 | STA6 | Error flag. Using screen peek/copy command | 0: Disable<br>1: Enable |
|     | D7 | STA7 | Check the condition blink                  | 0: Disable<br>1: Enable |

Note 1: It is necessary to check STA0 and STA1 at the same time. The error is happened by sending data at executing command.

Note 2: The status check will be enough to check STA0/STA1.

Note 3: STA2/STA3 are valid in auto mode STA0/STA1 are invalid.

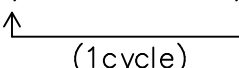
### Status checking flow



Note 4: It is impossible to save status check in the case of command of MSB0. To have the delay time cannot be save status check. The interrupt of hardware is happened at the end of lines. If command of MSB0 is sent in this period, the command executing is waited. The state of waiting doesn't disregarded or rewrites data of waiting command.

## 9. RELIABILITY TEST

### WIDE TEMPERATURE RELIABILITY TEST

| NO | ITEM                            | CONDITION                                                                                                                   |        |  | STANDARD                  | NOTE      |
|----|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------|--|---------------------------|-----------|
| 1  | High Temp. Storage              | 80°C                                                                                                                        | 120Hrs |  | Appearance without defect |           |
| 2  | Low Temp. Storage               | -40°C                                                                                                                       | 120Hrs |  | Appearance without defect |           |
| 3  | High Temp. & High Humi. Storage | 60°C<br>90%RH                                                                                                               | 120Hrs |  | Appearance without defect |           |
| 4  | High Temp. Operating Display    | 70°C                                                                                                                        | 120Hrs |  | Appearance without defect |           |
| 5  | Low Temp. Operating Display     | -20°C                                                                                                                       | 120Hrs |  | Appearance without defect |           |
| 6  | Thermal Shock                   | -20°C,30min → 70°C,30min<br><br>(1cycle) |        |  | Appearance without defect | 10 cycles |

Inspection Provision

1.Purpose

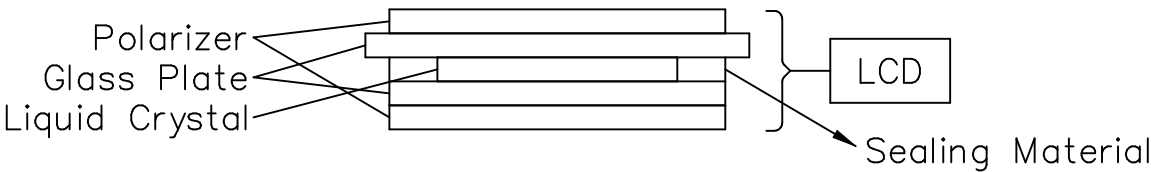
The NAN YA inspection provision provides outgoing inspection provision and its expected quality level based on our outgoing inspection of NAN YA LCD produces.

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 Ispection Method

MIL-STD-105E Level II Regular inspection

4-2 Inspection Standard

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

|                                                                 |                   |                                                     |      |                                                                                                   |  |
|-----------------------------------------------------------------|-------------------|-----------------------------------------------------|------|---------------------------------------------------------------------------------------------------|--|
| NAN YA PLASTICS CORP.<br>ELEC. MATERIALS DIV.<br>LCD DEPARTMENT |                   | SPECIFICATION                                       |      | SPEC. NO. : LM273-1A<br>DATE : NOV. 09, 2006<br>SHEET NO. : 18/25                                 |  |
|                                                                 | 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<br>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.

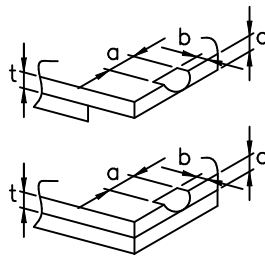
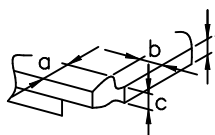
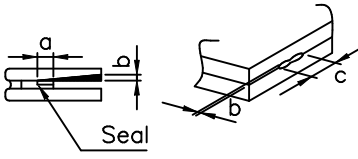
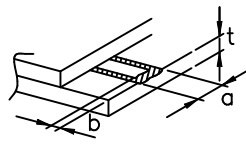
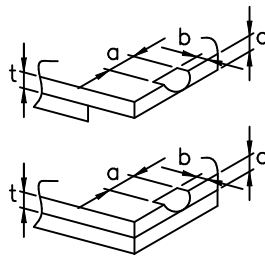
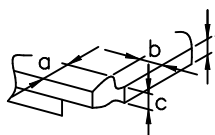
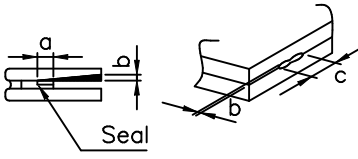
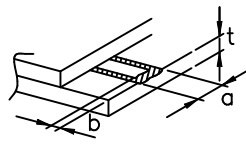
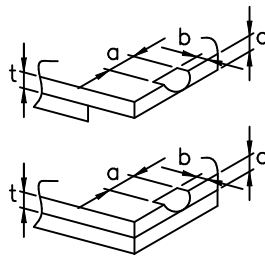
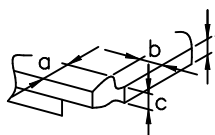
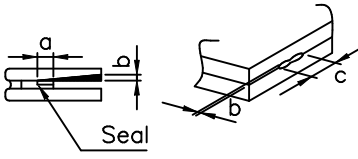
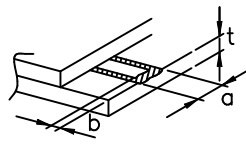
|          |                  |  |  |  |                |
|----------|------------------|--|--|--|----------------|
| REV/DATE | R0/<br>11.09.06' |  |  |  | BY<br>J.P Weng |
|----------|------------------|--|--|--|----------------|

| NAN YA PLASTICS CORP.<br>ELEC. MATERIALS DIV.<br>LCD DEPARTMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                            | SPECIFICATION          |  |  | SPEC. NO. : LM273-1A<br>DATE : NOV. 09, 2006<br>SHEET NO. : 19/25 |          |             |         |           |              |                 |                    |             |                |          |              |             |                    |    |                    |      |    |               |                        |    |                            |                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------|--|--|-------------------------------------------------------------------|----------|-------------|---------|-----------|--------------|-----------------|--------------------|-------------|----------------|----------|--------------|-------------|--------------------|----|--------------------|------|----|---------------|------------------------|----|----------------------------|------------------------|
| <p>*Test and measurement are performed under the following conditions, unless otherwise specified.</p> <p>Otherwise specified.</p> <table> <tr> <td>Temperature</td> <td>20± 15℃</td> </tr> <tr> <td>Humidity</td> <td>65± 20%R.H..</td> </tr> <tr> <td>Pressure</td> <td>860~1060hPa(mmbar)</td> </tr> </table> <p>In case of doubtful judgment, it is performed under the following conditions.</p> <table> <tr> <td>Temperature</td> <td>20± 15℃</td> </tr> <tr> <td>Humidity</td> <td>65± 20%R.H..</td> </tr> <tr> <td>Pressure</td> <td>860~1060hPa(mmbar)</td> </tr> </table> |                            |                        |  |  |                                                                   |          | Temperature | 20± 15℃ | Humidity  | 65± 20%R.H.. | Pressure        | 860~1060hPa(mmbar) | Temperature | 20± 15℃        | Humidity | 65± 20%R.H.. | Pressure    | 860~1060hPa(mmbar) |    |                    |      |    |               |                        |    |                            |                        |
| Temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 20± 15℃                    |                        |  |  |                                                                   |          |             |         |           |              |                 |                    |             |                |          |              |             |                    |    |                    |      |    |               |                        |    |                            |                        |
| Humidity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 65± 20%R.H..               |                        |  |  |                                                                   |          |             |         |           |              |                 |                    |             |                |          |              |             |                    |    |                    |      |    |               |                        |    |                            |                        |
| Pressure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 860~1060hPa(mmbar)         |                        |  |  |                                                                   |          |             |         |           |              |                 |                    |             |                |          |              |             |                    |    |                    |      |    |               |                        |    |                            |                        |
| Temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 20± 15℃                    |                        |  |  |                                                                   |          |             |         |           |              |                 |                    |             |                |          |              |             |                    |    |                    |      |    |               |                        |    |                            |                        |
| Humidity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 65± 20%R.H..               |                        |  |  |                                                                   |          |             |         |           |              |                 |                    |             |                |          |              |             |                    |    |                    |      |    |               |                        |    |                            |                        |
| Pressure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 860~1060hPa(mmbar)         |                        |  |  |                                                                   |          |             |         |           |              |                 |                    |             |                |          |              |             |                    |    |                    |      |    |               |                        |    |                            |                        |
| 5.Specification for quality check<br>5-1 Electrical characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                            |                        |  |  |                                                                   |          |             |         |           |              |                 |                    |             |                |          |              |             |                    |    |                    |      |    |               |                        |    |                            |                        |
| <table border="1"> <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>Fail</td> </tr> <tr> <td>5.</td> <td>Response time</td> <td>Within Specified Value</td> </tr> <tr> <td>6.</td> <td>CCFL backlight turn on/off</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 | Fail | 5. | Response time | Within Specified Value | 6. | CCFL backlight turn on/off | Within Specified Value |
| 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CCFL backlight turn on/off | Within Specified Value |  |  |                                                                   |          |             |         |           |              |                 |                    |             |                |          |              |             |                    |    |                    |      |    |               |                        |    |                            |                        |
| REV/DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                            | R0/                    |  |  |                                                                   | BY       |             |         |           |              |                 |                    |             |                |          |              |             |                    |    |                    |      |    |               |                        |    |                            |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                            | 11.09.06'              |  |  |                                                                   | J.P Weng |             |         |           |              |                 |                    |             |                |          |              |             |                    |    |                    |      |    |               |                        |    |                            |                        |

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.) | <div>(1)–1–Spots</div> <table><tr><th>Average Diameter(mm):D</th><th>Number of pieces permitted</th></tr><tr><td>D ≤0.1</td><td>Ignore</td></tr><tr><td>0.1&lt;D ≤0.2</td><td>5</td></tr><tr><td>0.2&lt;D ≤0.3</td><td>2</td></tr><tr><td>0.3&lt;D</td><td>0</td></tr></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.<br/>Set as: Average diameter = (Long diameter + Short diameter)/2</p> <div>(1)–2–Blurred Spots(At lighting condition)</div> <table><tr><th>Average Diameter(mm):D</th><th>Number of pieces permitted</th></tr><tr><td>D ≤0.3</td><td>Ignore</td></tr><tr><td>0.3&lt;D ≤0.75</td><td>5</td></tr><tr><td>0.75&lt;D</td><td>0</td></tr></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.<br/>Set as: Average diameter = (Long diameter + Short diameter)/2</p> | Average Diameter(mm):D | Number of pieces permitted | D ≤0.1 | Ignore | 0.1<D ≤0.2 | 5 | 0.2<D ≤0.3 | 2 | 0.3<D | 0 | Average Diameter(mm):D | Number of pieces permitted | D ≤0.3 | Ignore | 0.3<D ≤0.75 | 5 | 0.75<D | 0 |
| Average Diameter(mm):D | Number of pieces permitted                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                            |        |        |            |   |            |   |       |   |                        |                            |        |        |             |   |        |   |
| D ≤0.1                 | Ignore                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                            |        |        |            |   |            |   |       |   |                        |                            |        |        |             |   |        |   |
| 0.1<D ≤0.2             | 5                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                            |        |        |            |   |            |   |       |   |                        |                            |        |        |             |   |        |   |
| 0.2<D ≤0.3             | 2                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                            |        |        |            |   |            |   |       |   |                        |                            |        |        |             |   |        |   |
| 0.3<D                  | 0                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                            |        |        |            |   |            |   |       |   |                        |                            |        |        |             |   |        |   |
| Average Diameter(mm):D | Number of pieces permitted                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                            |        |        |            |   |            |   |       |   |                        |                            |        |        |             |   |        |   |
| D ≤0.3                 | Ignore                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                            |        |        |            |   |            |   |       |   |                        |                            |        |        |             |   |        |   |
| 0.3<D ≤0.75            | 5                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                            |        |        |            |   |            |   |       |   |                        |                            |        |        |             |   |        |   |
| 0.75<D                 | 0                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |                            |        |        |            |   |            |   |       |   |                        |                            |        |        |             |   |        |   |

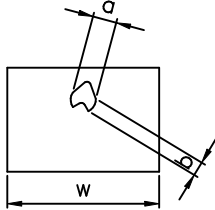
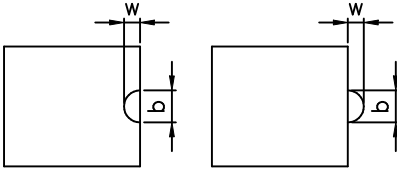
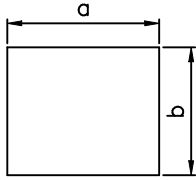
| 1.                   | Line                                                       | <p>(1)–1–Lines(At non lighting condition)</p> <table border="1"> <tr> <th>Width(mm): W</th> <th>Length(mm): L</th> <th>Number of pieces permitted</th> </tr> <tr> <td><math>W \leq 0.03</math></td> <td>Ignore</td> <td>Ignore</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> </table> <p>Object exceeding 0.1mm follow the standards of the spots form.<br/>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"> <tr> <th>Width(mm): W</th> <th>Length(mm): L</th> <th>Number of pieces permitted</th> </tr> <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> </table> <p>Object exceeding 0.1mm follow the standards of the spots form.<br/>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.<br>(At non lighting condition)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |               |                            |               |        |        |                      |            |   |                     |            |   |              |               |                            |               |        |        |                      |            |   |            |         |      |
| 3.                   | Color irregular                                            | Not remarkable color irregular.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |               |                            |               |        |        |                      |            |   |                     |            |   |              |               |                            |               |        |        |                      |            |   |            |         |      |

| 4.                        | Air bubbles polarizing plates, and reflection plates                                 | <table><tr><th>Average Diameter (mm): D</th><th>Number of pieces permitted</th><th rowspan="2">Average diameter = (Long diameter + Short diameter)/2</th></tr><tr><td><math>D \leq 0.3</math><br/><math>0.3 &lt; D</math></td><td>Ignore<br/>0</td></tr></table> <p>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                                                                                                 | $D \leq 0.3$<br>$0.3 < D$ | Ignore<br>0                                                                         |                                                              |                       |                                                                                      |                                                                                                                                      |                  |                                                                                     |                                                             |                       |  |                               |
|---------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------|--|-------------------------------|
| Average Diameter (mm): D  | Number of pieces permitted                                                           | Average diameter = (Long diameter + Short diameter)/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                          |                                                                                    |                                                                                                                                                       |                           |                                                                                     |                                                              |                       |                                                                                      |                                                                                                                                      |                  |                                                                                     |                                                             |                       |  |                               |
| $D \leq 0.3$<br>$0.3 < D$ | Ignore<br>0                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                          |                                                                                    |                                                                                                                                                       |                           |                                                                                     |                                                              |                       |                                                                                      |                                                                                                                                      |                  |                                                                                     |                                                             |                       |  |                               |
| 5.                        | Cracks                                                                               | <table><tr><td>(1)General crack</td><td></td><td><math>a \leq 5</math><br/><math>b \leq 2</math><br/><math>c \leq t</math><br/>Where, a and b are ignored when less than or equal 0.5.<br/>The numbers of pieces are set at up to 5 pieces.</td></tr><tr><td>(2)Corner crack</td><td></td><td><math>a \leq 2.5</math><br/><math>b \leq 2.5</math><br/><math>c \leq t</math><br/><math>a + b \leq 4</math></td></tr><tr><td>(3)Seal portion crack</td><td></td><td><math>a \leq \text{The seal width} \times 1/3</math><br/><math>b \leq t \times 2/3</math><br/><math>c \leq 5</math><br/>The numbers of pieces are set at up to 5 pieces.</td></tr><tr><td>(4)ITO Pin crack</td><td></td><td><math>a \leq 5</math><br/><math>b \leq 1/3 \text{ pin length}</math><br/><math>c \leq t</math></td></tr><tr><td>(5)Progressive cracks</td><td></td><td>All taken to be unacceptable.</td></tr></table> | (1)General crack         |  | $a \leq 5$<br>$b \leq 2$<br>$c \leq t$<br>Where, a and b are ignored when less than or equal 0.5.<br>The numbers of pieces are set at up to 5 pieces. | (2)Corner crack           |  | $a \leq 2.5$<br>$b \leq 2.5$<br>$c \leq t$<br>$a + b \leq 4$ | (3)Seal portion crack |  | $a \leq \text{The seal width} \times 1/3$<br>$b \leq t \times 2/3$<br>$c \leq 5$<br>The numbers of pieces are set at up to 5 pieces. | (4)ITO Pin crack |  | $a \leq 5$<br>$b \leq 1/3 \text{ pin length}$<br>$c \leq t$ | (5)Progressive cracks |  | All taken to be unacceptable. |
| (1)General crack          |    | $a \leq 5$<br>$b \leq 2$<br>$c \leq t$<br>Where, a and b are ignored when less than or equal 0.5.<br>The numbers of pieces are set at up to 5 pieces.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                          |                                                                                    |                                                                                                                                                       |                           |                                                                                     |                                                              |                       |                                                                                      |                                                                                                                                      |                  |                                                                                     |                                                             |                       |  |                               |
| (2)Corner crack           |   | $a \leq 2.5$<br>$b \leq 2.5$<br>$c \leq t$<br>$a + b \leq 4$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                          |                                                                                    |                                                                                                                                                       |                           |                                                                                     |                                                              |                       |                                                                                      |                                                                                                                                      |                  |                                                                                     |                                                             |                       |  |                               |
| (3)Seal portion crack     |  | $a \leq \text{The seal width} \times 1/3$<br>$b \leq t \times 2/3$<br>$c \leq 5$<br>The numbers of pieces are set at up to 5 pieces.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                          |                                                                                    |                                                                                                                                                       |                           |                                                                                     |                                                              |                       |                                                                                      |                                                                                                                                      |                  |                                                                                     |                                                             |                       |  |                               |
| (4)ITO Pin crack          |   | $a \leq 5$<br>$b \leq 1/3 \text{ pin length}$<br>$c \leq t$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                          |                                                                                    |                                                                                                                                                       |                           |                                                                                     |                                                              |                       |                                                                                      |                                                                                                                                      |                  |                                                                                     |                                                             |                       |  |                               |
| (5)Progressive cracks     |                                                                                      | All taken to be unacceptable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                          |                                                                                    |                                                                                                                                                       |                           |                                                                                     |                                                              |                       |                                                                                      |                                                                                                                                      |                  |                                                                                     |                                                             |                       |  |                               |

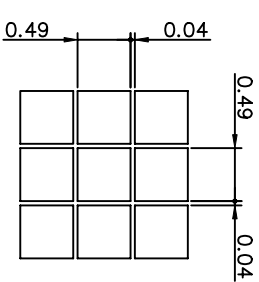
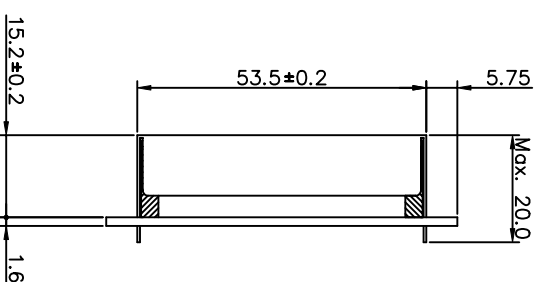
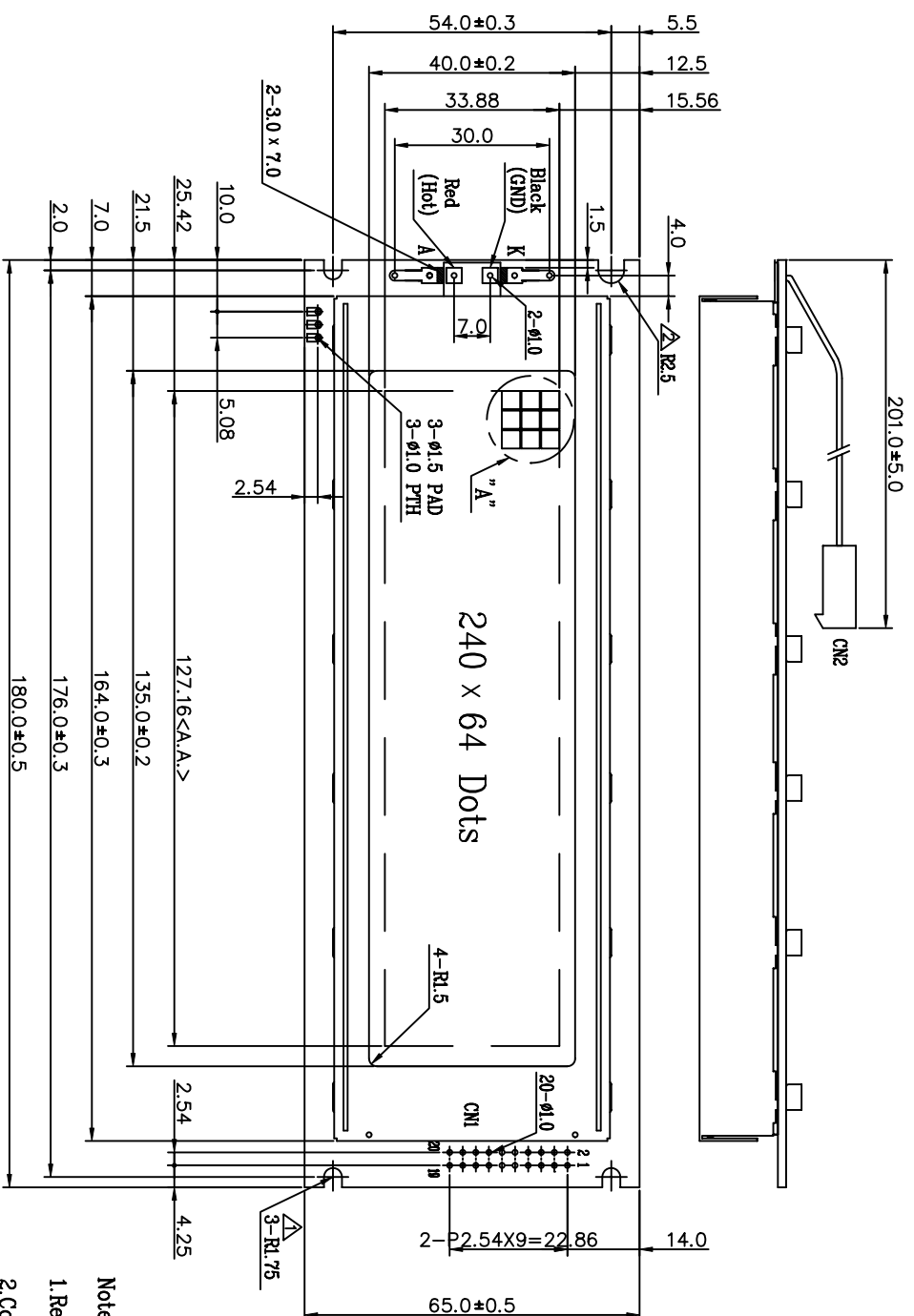


|    |                          |                                                                                                                                                          |
|----|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6. | Outer dimensions         | Should be with in 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 mouting 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><br/>The overall total is taken be with in 10 units.<br/>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><br/>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>                                                                         |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |               |  |  |                                                                  |                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------|--|--|------------------------------------------------------------------|----------------|
| NAN YA PLASTICS CORP.<br>ELEC. MATERIALS DIV.<br>LCD DEPARTMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  | SPECIFICATION |  |  | SPEC. NO. : LM273-1A<br>DATE : NOV. 09, 2006<br>SHEET NO. :24/25 |                |
| <p>NOTICE:</p> <ul style="list-style-type: none"><li>• SAFETY<ol style="list-style-type: none"><li>1.If the LCD panel breaks, be careful not to get the liquid crystal to touch your skin.</li><li>2.If the liquid crystal touches your skin or clothes, please wash it off immediately by using soap and water.</li></ol></li><li>• HANDLING<ol style="list-style-type: none"><li>1.Avoid static electricity which can damage the CMOS LSI.</li><li>2.Do not remove the panel or frame from the module.</li><li>3.The polarizing plate of the display is very fragile. So, please handle it very carefully.</li><li>4.Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.</li><li>5.Do not use ketonics solvent &amp; Aromatic solvent, use a soft cloth soaked with a cleaning naphtha solvent.</li></ol></li><li>• STORAGE<ol style="list-style-type: none"><li>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.</li><li>2.Do not place the module near organics solvents or corrosive gases.</li><li>3.Do not crush, shake, or jolt the module.</li></ol></li><li>• TERMS OF WARRANT<ol style="list-style-type: none"><li>1.Acceptance inspection period<br/>The period is within one month after the arrival of contracted commodity at the buyer's factory site.</li><li>2.Applicable warrant period<br/>The period is within twelve months since the date of shipping out under normal using and storage conditions.</li></ol></li></ul> |                  |               |  |  |                                                                  |                |
| REV/DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | R0/<br>11.09.06' |               |  |  |                                                                  | BY<br>J.P Weng |



Detail "A"  
(Scale 20:1)

CN1 : Pitch 2.54 mm

View Direction

CN2 : Pitch 3.96 mm

Notes :

- 1.Resolution : 240 × 64 Dots
- 2.Controller IC : AX8963
- 3.Backlight : CCFL
- 4.Frame : SPCC (0.5 t)

## GENERAL TOLERANCE LIST

| DIMENSION         | TOLERANCE       |
|-------------------|-----------------|
| L $\leq$ 6        | $\pm 0.25$ (mm) |
| 6 < L $\leq$ 18   | $\pm 0.3$ (mm)  |
| 18 < L $\leq$ 50  | $\pm 0.4$ (mm)  |
| 50 < L $\leq$ 125 | $\pm 0.5$ (mm)  |
| 125 < L           | $\pm 0.6$ (mm)  |

|                                                                                     |   |       |
|-------------------------------------------------------------------------------------|---|-------|
| ANGL                                                                                | 1 | (DEG) |
|  |   |       |
| <b>南亞塑膠工業股份有限公司</b><br>NAN YA PLASTICS CORPORATION                                  |   |       |

建品園

LMBJ6N273SID5\_

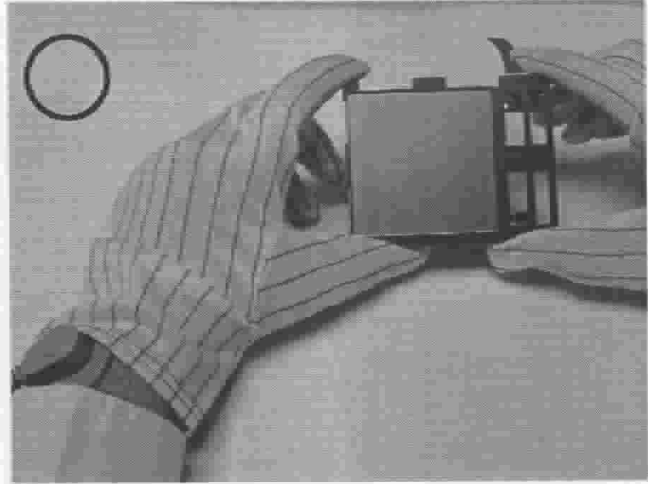
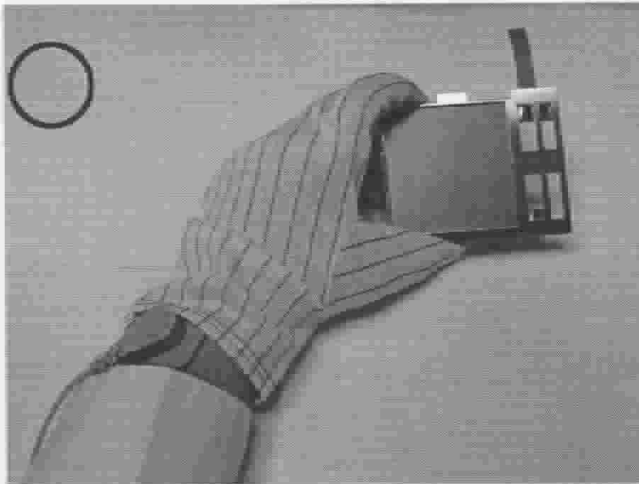
| Power Supply for CCFL (GND) |                   |         |         |           |         |      |      |                |  |
|-----------------------------|-------------------|---------|---------|-----------|---------|------|------|----------------|--|
| 4                           |                   | GND     |         |           |         |      |      |                |  |
|                             |                   |         |         |           |         |      |      |                |  |
| A <sub>5</sub>              |                   |         |         |           |         |      |      |                |  |
| A <sub>4</sub>              |                   |         |         |           |         |      |      |                |  |
| A <sub>3</sub>              |                   |         |         |           |         |      |      |                |  |
| A <sub>2</sub>              |                   |         |         |           |         |      |      |                |  |
| A <sub>1</sub>              |                   |         |         |           |         |      |      |                |  |
| REV. NO.                    | DESCRIPTION       | DATE    | DESIGN  | CHECK     | APPROVE | NAME | DATE | THIRD ANGLE P. |  |
|                             | Modified PCB hole | 96.4.28 | C.B.Lan | Louis Lee | L.C.Wu  |      |      |                |  |
|                             | Modified PCB hole |         |         |           |         |      |      |                |  |
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# THE NOTES OF LCM USING

LCM is easy to damage.

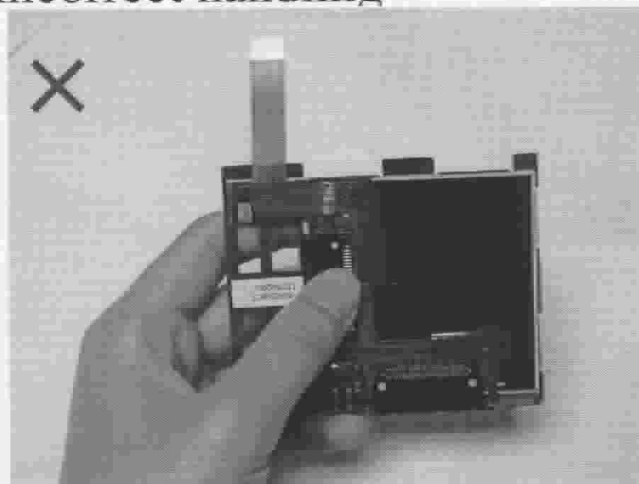
Please follow the notes as bellows, and be careful of handling!

## Correct handling

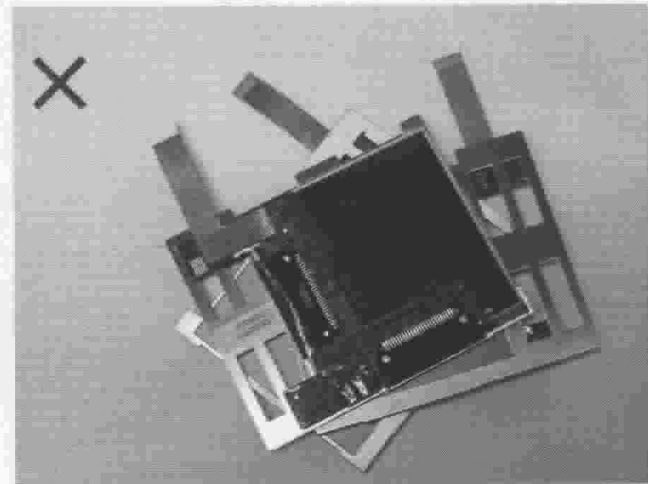


As above picture, please handle with glove by LCM edges and full EOS/ESD protection.

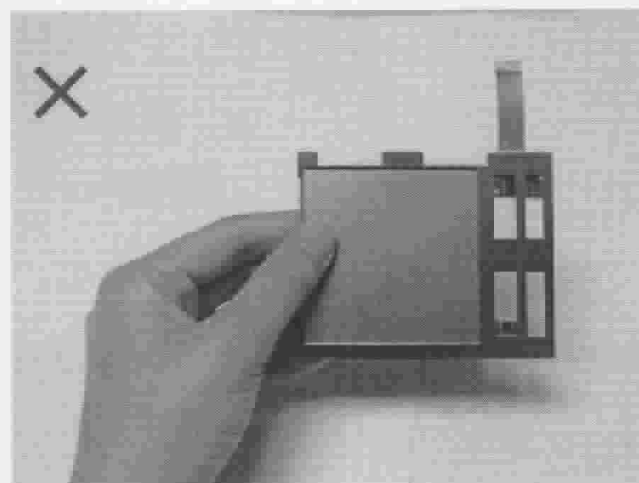
## Incorrect handling



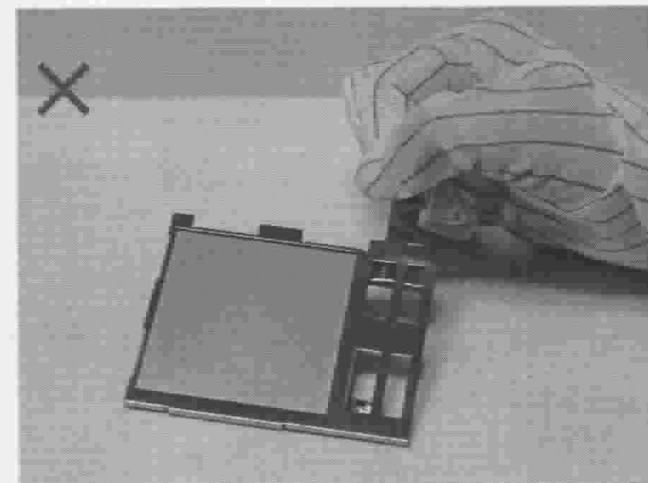
Please don't touch IC directly.



Please don't put one on another LCM.



Please don't hold the surface of LCM.



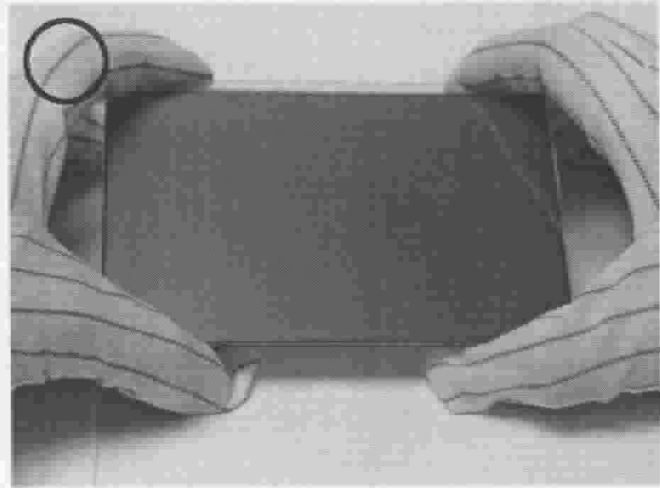
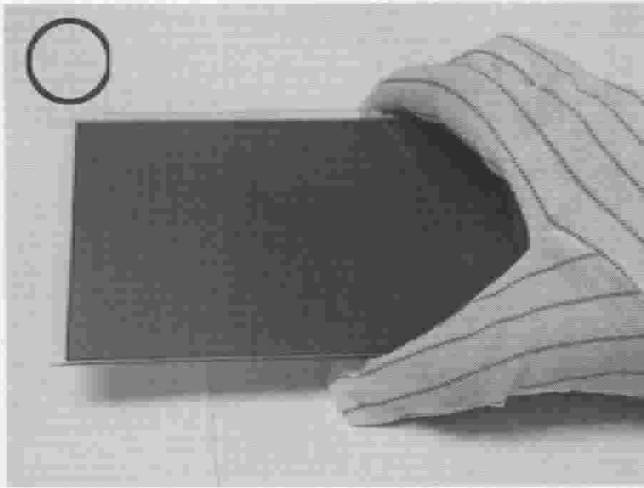
Please don't stretch interface of output.

# THE NOTES OF LCD USING

LCD is easy damage.

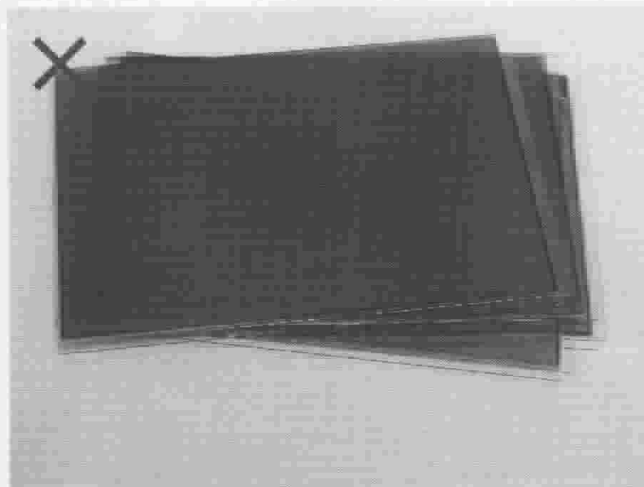
Please follow notes as bellows, and be careful of handling!

## Correct handling

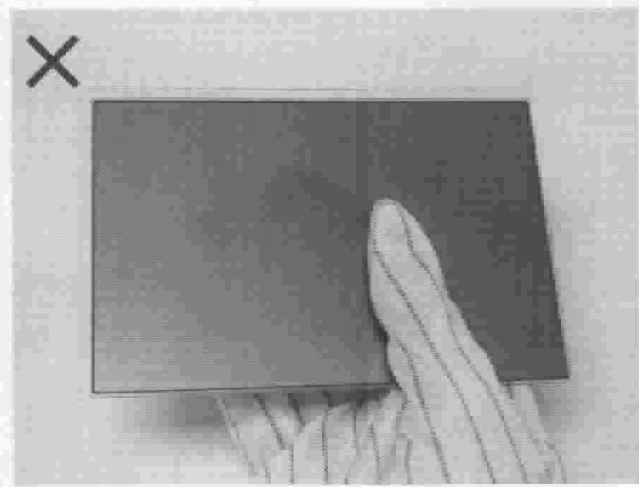


As above picture, please handle with glove by LCD edges and full EOS/ESD protection.

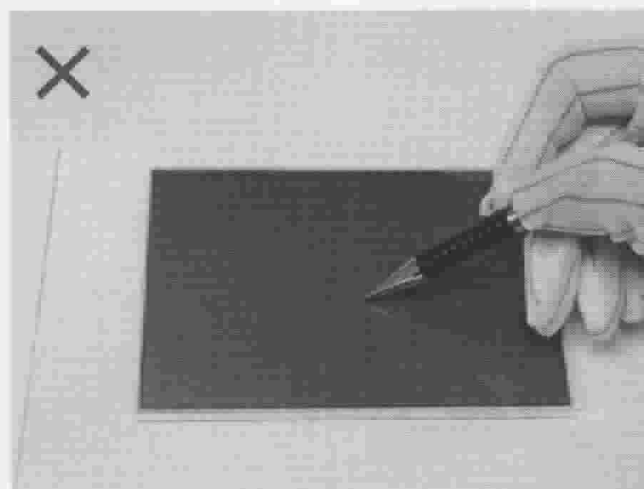
## Incorrect handling



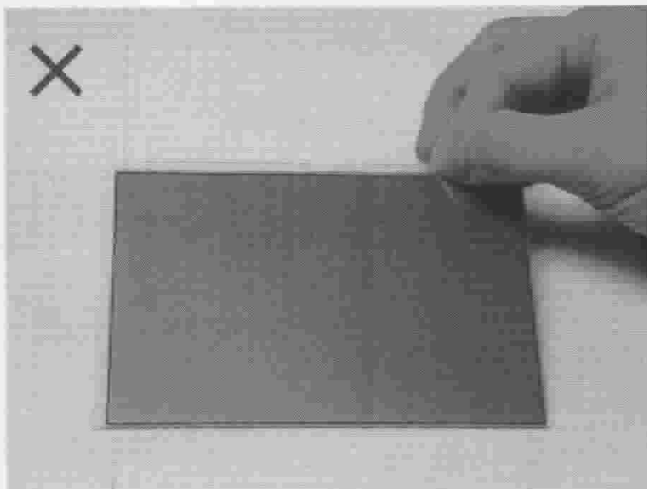
Please don't put one on another LCD.



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.

