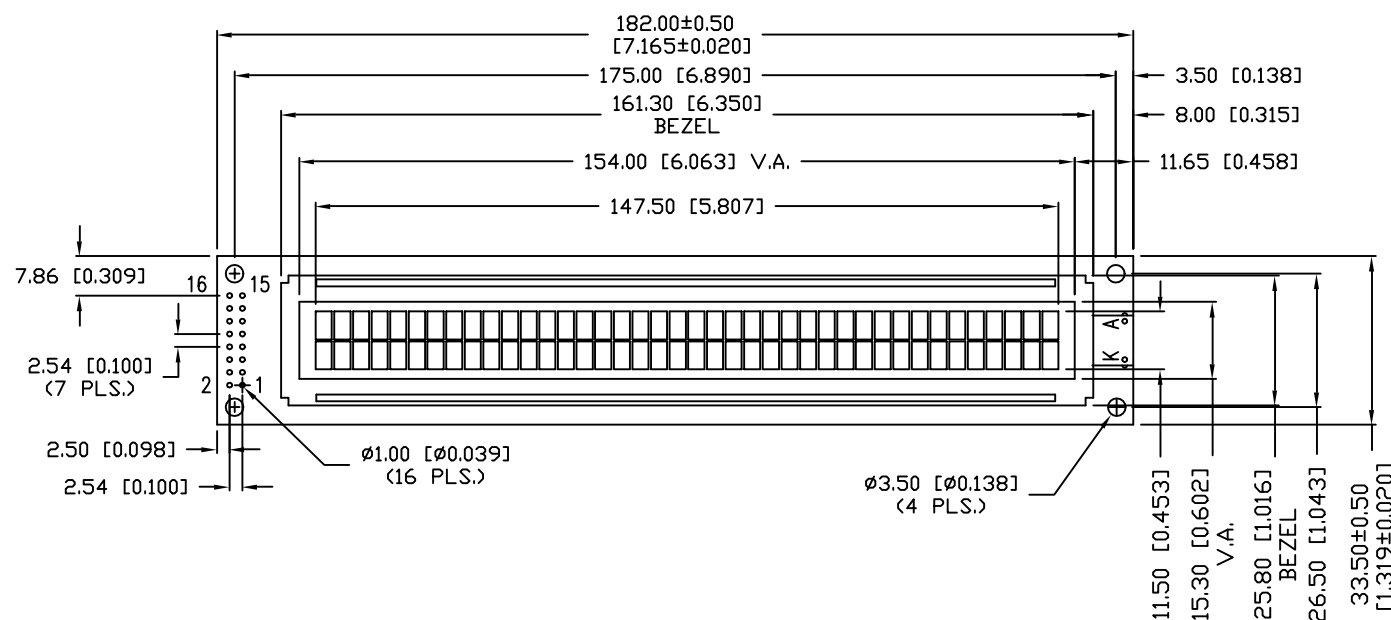
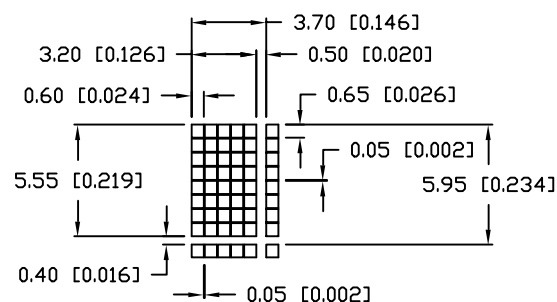


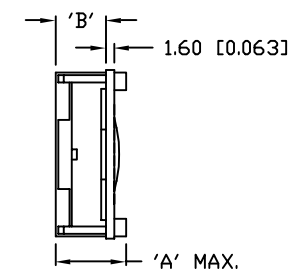
| P/N PREFIX/SUFFIX TABLE |    |                                  |
|-------------------------|----|----------------------------------|
| LCM-X                   | DX | DESCRIPTION                      |
| STANDARD                | S  | SR STN, REFLECTIVE               |
|                         | SF | STN, TRANSFLECTIVE(W/ BACKLIGHT) |
| HIGH TEMP.              | H  | TR TN, REFLECTIVE                |
|                         | TF | TN, TRANSFLECTIVE(W/ BACKLIGHT)  |

CAUTION: STATIC SENSITIVE DEVICE  
FOLLOW PROPER E.S.D. HANDLING PROCEDURES  
WHEN WORKING WITH THIS PART.

## CHARACTER DETAIL



| TYPE           | DIM. | A    | B   |
|----------------|------|------|-----|
| WITH BACKLIGHT |      | 12.7 | 8.7 |
| NO BACKLIGHT   |      | 8.8  | 4.7 |



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\*UNLESS OTHERWISE SPECIFIED TOLERANCE IS  $\pm 0.25\text{mm}$  ( $\pm 0.010''$ )

REV.

PART NUMBER

LCM-X04002DXX

5.55mm CHARACTER HEIGHT, 5 x 8 DOT MATRIX, 40 x 2 LCD  
CHARACTER MODULE, 1/16 DUTY, 1/5 BIAS.

## CONFIDENTIAL INFORMATION

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## RELIABILITY NOTE

OUR MANY YEARS OF EXPERIENCE DATA ACCUMULATION INDICATE THAT SOLDER HEAT IS A MAJOR CAUSE OF EARLY AND FUTURE FAILURE. PLEASE PAY ATTENTION TO YOUR SOLDERING PROCESS.

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DRAWN BY:

CHECKED BY:

APPROVED BY:

DATE: 9-30-98

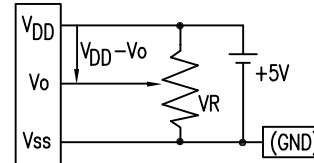
SA/BC

PAGE: 1 OF 2

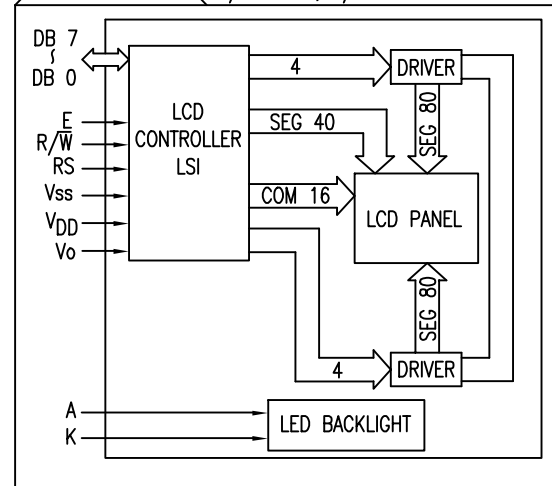
SCALE: N/A

## PIN CONFIGURATION

| PIN NO. | SYMBOL          | LEVEL  | FUNCTION                                                        |               |
|---------|-----------------|--------|-----------------------------------------------------------------|---------------|
| 1       | V <sub>SS</sub> | -      | POWER SUPPLY                                                    | GND (0V)      |
| 2       | V <sub>DD</sub> | -      |                                                                 | 5V            |
| 3       | V <sub>O</sub>  | -      |                                                                 | FOR LCD DRIVE |
| 4       | RS              | H/L    | REGISTER SELECT SIGNAL<br>H: DATA INPUT<br>L: INSTRUCTION INPUT |               |
| 5       | R/ $\bar{W}$    | H/L    | H: DATA READ (MODULE-->MPU)<br>L: DATA WRITE (MODULE<--MPU)     |               |
| 6       | E               | H,H->L | ENABLE                                                          |               |
| 7~14    | DB0~DB7         | H/L    | DATA BUS-SOFTWARE SELECTABLE 4 OR 8 BIT MODE.                   |               |
| 15      | A               | -      | ANODE                                                           | LED BACKLIGHT |
| 16      | K               | -      | CATHODE                                                         | LED BACKLIGHT |

V<sub>DD</sub>-V<sub>O</sub>: LCD DRIVING VOLTAGEVR: 10K $\Omega$  - 20K $\Omega$ 

## BLOCK DIAGRAM 1/16 DUTY, 1/5 BIAS



## ELECTRICAL CHARACTERISTICS

V<sub>DD</sub>=4.7V to 5.3V, T<sub>A</sub>=25°C

| ITEM                     | SYMBOL                           | CONDITION           | STANDARD VALUE        |      |      | UNIT              |
|--------------------------|----------------------------------|---------------------|-----------------------|------|------|-------------------|
|                          |                                  |                     | MIN.                  | TYP. | MAX. |                   |
| SUPPLY VOLTAGE FOR LOGIC | V <sub>DD</sub> -V <sub>SS</sub> | -                   | -                     | 5.0  | -    | V                 |
| SUPPLY CURRENT FOR LOGIC | I <sub>DD</sub>                  | V <sub>DD</sub> =5V | -                     | 2.0  | 3.0  | mA                |
| INPUT VOLTAGE            | HIGH<br>LOW                      | V <sub>IH</sub>     | -                     | 2.2  | -    | V <sub>DD</sub>   |
|                          |                                  | V <sub>IL</sub>     | -                     | 0    | -    | 0.6               |
| OUTPUT VOLTAGE           | HIGH<br>LOW                      | V <sub>OH</sub>     | -                     | 2.4  | -    | V                 |
|                          |                                  | V <sub>OL</sub>     | -                     | -    | 0.4  | V                 |
| *LED BACKLIGHT           | VOLTAGE                          | V <sub>f</sub>      | -                     | 4.2  | 4.6  | V                 |
|                          | CURRENT                          | I <sub>f</sub>      | -                     | 210  | -    | mA                |
|                          | POWER CONSUMPTION                | PD                  | -                     | 882  | -    | mW                |
|                          | LUMINOUS                         | L                   | I <sub>f</sub> =210mA | 70   | -    | cd/m <sup>2</sup> |
|                          | COLOR                            | -                   | -                     | -    | -    | nm                |

\*ONLY APPLIES TO MODULES WITH BACKLIGHT

## ABSOLUTE MAXIMUM RATINGS

| ITEM                         | SYMBOL                           | TEST CONDITION       | STANDARD VALUE  |                 | UNIT |
|------------------------------|----------------------------------|----------------------|-----------------|-----------------|------|
|                              |                                  |                      | MIN             | MAX             |      |
| SUPPLY VOLTAGE FOR LOGIC     | V <sub>DD</sub> -V <sub>SS</sub> | T <sub>a</sub> =25°C | 4.7             | 5.3             | V    |
| SUPPLY VOLTAGE FOR LCD DRIVE | V <sub>DD</sub> -V <sub>O</sub>  | -                    | 4.2@50°C        | 4.8@0°C         | V    |
| INPUT VOLTAGE                | V <sub>I</sub>                   | T <sub>a</sub> =25°C | V <sub>SS</sub> | V <sub>DD</sub> | V    |
| OPERATING TEMPERATURE        | T <sub>opr</sub>                 | LCM-S                | 0               | 50              | °C   |
|                              |                                  | LCM-H                | -20             | 70              | °C   |
| STORAGE TEMPERATURE          | T <sub>stg</sub>                 | LCM-S                | -20             | 70              | °C   |
|                              |                                  | LCM-H                | -30             | 85              | °C   |

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\*UNLESS OTHERWISE SPECIFIED TOLERANCE IS ±0.25mm (±0.010")

REV.

PART NUMBER

LCM-X04002DXX

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PAGE: 2 OF 2

SCALE: N/A