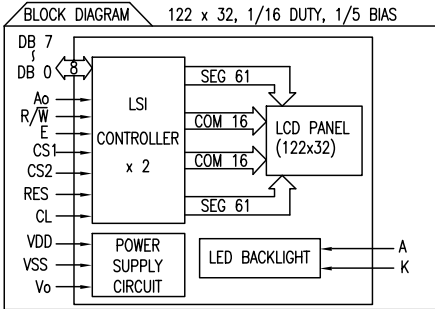
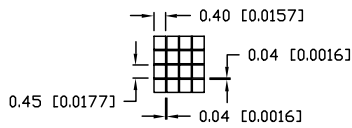


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PIXEL DETAIL

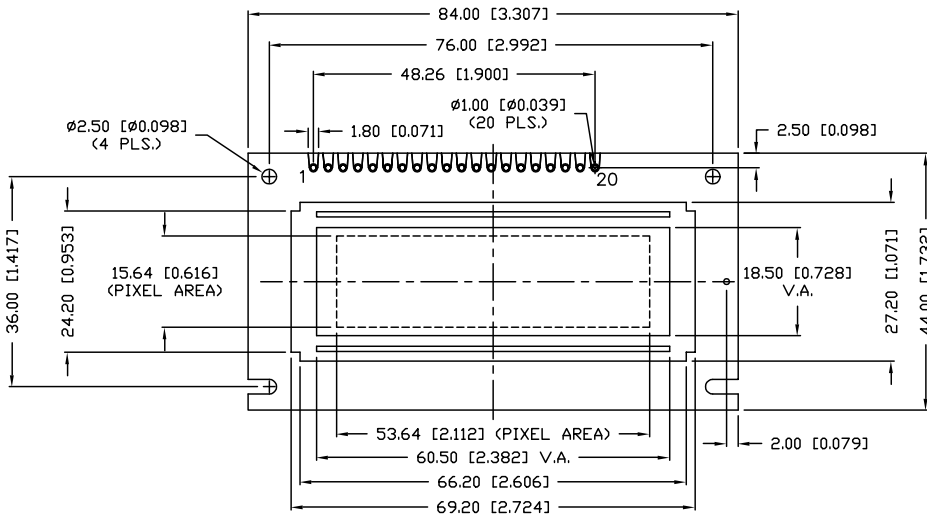


PART NUMBER
LCM-X12232GXX

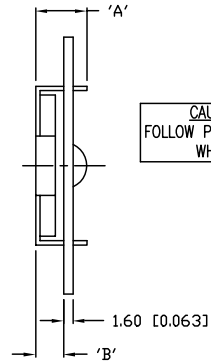
REV.
B

| REV. | E.C.N. NUMBER AND REVISION COMMENTS | DATE |
|------|-------------------------------------|---------|
| A | E.C.N. #10433./ | 6-8-98 |
| B | E.C.N. #10BRDR. & REDRAWN. | 10-2-98 |

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



| TYPE | DIM. | A | B |
|----------------|------|------|-----|
| WITH BACKLIGHT | | 12.7 | 8.7 |
| NO BACKLIGHT | | 8.8 | 4.8 |



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

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

| | |
|-----------|------------------------------|
| REV. B | PART NUMBER LCM-X12232GXX |
|-----------|------------------------------|

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122 x 32 DOT MATRIX GRAPHIC MODULE,
1/16 DUTY, 1/5 BIAS.

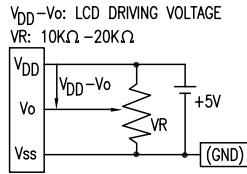
RELIABILITY NOTE
OUR MANY YEARS OF EXPERIENCE DATA ACCUMULATION INDICATE THAT SOLDER HEAT IS A MAJOR CAUSE OF EARLY AND FUTURE FAILURE. PLEASE PAY ATTENTION TO YOUR SOLDERING PROCESS.

| | | | |
|--------------------|-------------|--------------|--------------|
| DRAWN BY: SA/BC | CHECKED BY: | APPROVED BY: | DATE: 4-6-98 |
| | | | PAGE: 1 OF 2 |
| | | | SCALE: N/A |

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| PART NUMBER | | REV. |
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| REV. | E.C.N. NUMBER AND REVISION COMMENTS | DATE |
| | SEE PAGE #1./ | |

| PIN CONFIGURATION | | | FUNCTION |
|-------------------|-----------------|--------|---|
| 1 | V _{SS} | - | POWER SUPPLY GND (0V) 5V FOR LCD DRIVE |
| 2 | V _{DD} | - | |
| 3 | V _O | - | |
| 4 | A ₀ | H/L | REGISTER SELECT SIGNAL H: DATA INPUT L: INSTRUCTION INPUT |
| 5 | CS1 | H,H->L | CHIP SELECT SIGNAL FOR IC1 |
| 6 | CS2 | H,H->L | CHIP SELECT SIGNAL FOR IC2 |
| 7 | CL | H/L | CLOCK INPUT (2kHz) |
| 8 | E | H/L | ENABLE SIGNAL (NO PULL-UP RESISTOR) |
| 9 | R/W | H/L | H: DATA READ (MODULE->-MPU) L: DATA WRITE (MODULE<-MPU) |
| 10~17 | DB0~DB7 | H/L | DATA BIT 0-7 |
| 18 | RST | L | RESET SIGNAL |
| 19 | A | - | ANODE LED BACKLIGHT |
| 20 | K | - | CATHODE LED BACKLIGHT |



| READ/WRITE TIMING FOR 68 PORT MPU | | | | | |
|-----------------------------------|----------------|-------------------|-----------------|-----|------|
| PARAMETER | SIGNAL | SYMBOL | MIN | MAX | UNIT |
| ADDRESS HOLD TIME | CS | t _{AH6} | 10 | - | ns |
| ADDRESS SETUP TIME | R/W | t _{AS6} | 20 | - | ns |
| SYSTEM CYCLE TIME | A ₀ | t _{CYC6} | 1000 | - | ns |
| DATA SETUP TIME | D0~D7 | t _{DS6} | 80 | - | ns |
| DATA HOLD TIME | | t _{DH6} | 10 | - | ns |
| OUTPUT DISABLE TIME | | t _{OH6} | 10 | 60 | ns |
| ACCESS TIME | E | t _{ACC6} | - | 90 | ns |
| ENABLE PULSE WIDTH | | (READ) (WRITE) | t _{EW} | 100 | - |
| | | | 80 | - | ns |

| ELECTRICAL CHARACTERISTICS | | V _{DD} =4.5V to 5.5V, T _A =25°C | | | | |
|----------------------------|----------------------------------|---|-----------------------|------|-----------------|-------------------|
| ITEM | SYMBOL | CONDITION | STANDARD VALUE | | | UNIT |
| | | | MIN. | TYP. | MAX. | |
| SUPPLY VOLTAGE FOR LOGIC | V _{DD} -V _{SS} | - | - | 5.0 | - | V |
| SUPPLY CURRENT FOR LOGIC | I _{DD} | V _{DD} =5V | - | - | 3.0 | mA |
| INPUT VOLTAGE** | V _{IH} | - | 0.2 | - | V _{DD} | V |
| | V _{IL} | - | 0 | - | 0.8 | V |
| OUTPUT VOLTAGE*** | V _{OH} | I _{OH} =-3mA | 2.4 | - | - | V |
| | V _{OL} | I _{OL} =3mA | - | - | 0.4 | V |
| *LED BACKLIGHT | VOLTAGE | V _f | - | 4.2 | 4.6 | V |
| | CURRENT | I _f | - | 170 | 330 | mA |
| | POWER CONSUMPTION | PD | - | 710 | - | mW |
| | LUMINOUS | L | I _f =170mA | 70 | - | cd/m ² |
| | COLOR | - | - | - | - | nm |

| ABSOLUTE MAXIMUM RATINGS | | | | | |
|------------------------------|----------------------------------|----------------------|-----------------|-----------------|------|
| ITEM | SYMBOL | TEST CONDITION | STANDARD VALUE | | UNIT |
| SUPPLY VOLTAGE FOR LOGIC | V _{DD} -V _{SS} | T _a =25°C | 4.75 | 5.25 | V |
| SUPPLY VOLTAGE FOR LCD DRIVE | V _{DD} -V _O | - | 4.8@50°C | 5.2@0°C | V |
| INPUT VOLTAGE | V _I | T _a =25°C | V _{SS} | V _{DD} | V |
| OPERATING TEMPERATURE | T _{opr} | LCM-S | 0 | 50 | °C |
| | | LCM-H | -20 | 70 | °C |
| STORAGE TEMPERATURE | T _{stg} | LCM-S | -20 | 70 | °C |
| | | LCM-H | -30 | 85 | °C |

*ONLY APPLIES TO MODULES WITH BACKLIGHT

□ **APPLIED TO TERMINALS DB0~DB7

***APPLIED TO TERMINALS E, A₀, DB0~DB7

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| 122 x 32 DOT MATRIX GRAPHIC MODULE, 1/16 DUTY, 1/5 BIAS. | | DRAWN BY: SA/BC | CHECKED BY: APPROVED BY: DATE: 4-6-98 |
| | | PAGE: 2 OF 2 SCALE: N/A | |