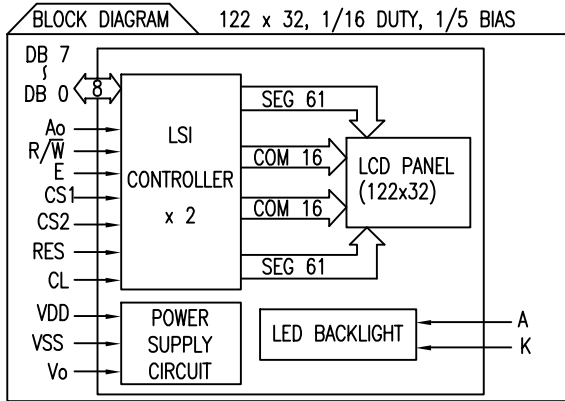
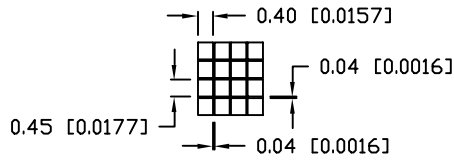


UNCONTROLLED DOCUMENT

□ □



PIXEL DETAIL



PART NUMBER
LCM-X12232GXX

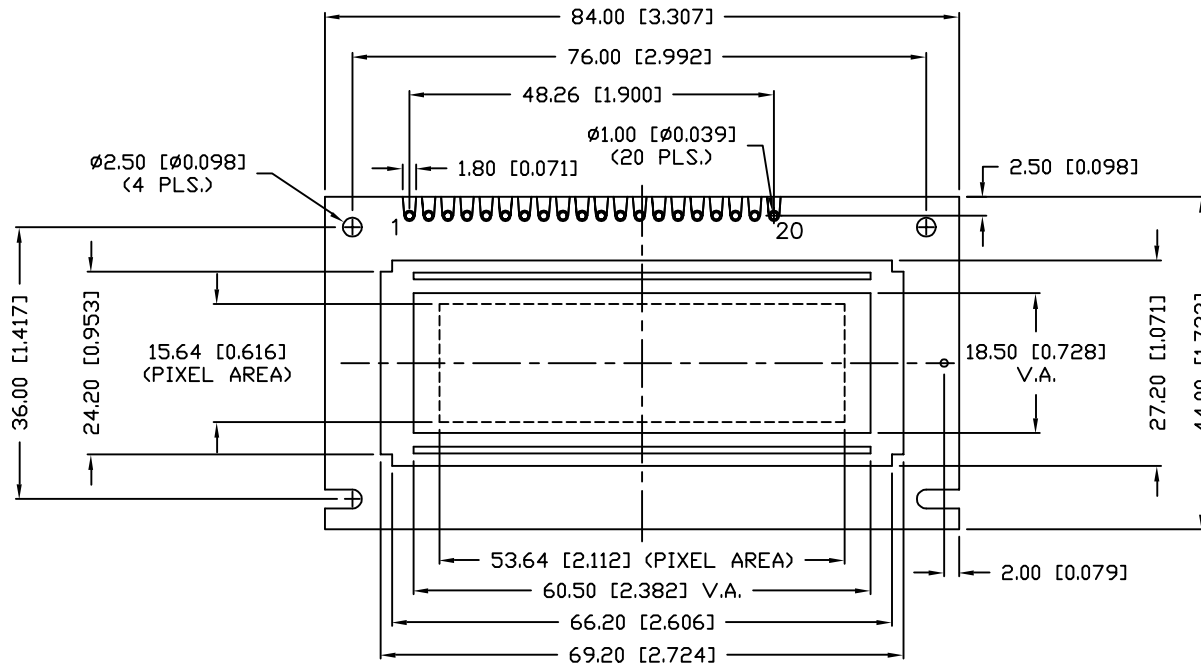
REV.

B

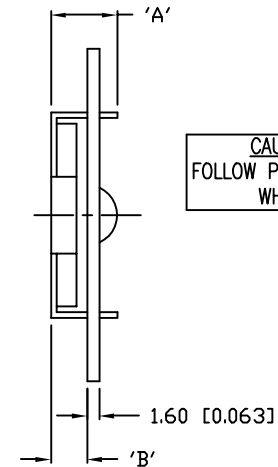
| REV. | E.C.N. NUMBER AND REVISION COMMENTS | DATE |
|------|-------------------------------------|---------|
| A | E.C.N. #10433./ | 6-8-98 |
| B | E.C.N. #10BRDR. & REDRAWN. | 10-2-98 |

P/N PREFIX/SUFFIX TABLE

| LCM-X | DXX | DESCRIPTION |
|------------|-----|----------------------------------|
| STANDARD | S | STN, REFLECTIVE |
| HIGH TEMP. | H | 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.

UNCONTROLLED DOCUMENT

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

| | |
|---|------------------------------|
| REV. B | PART NUMBER LCM-X12232GXX |
| 122 x 32 DOT MATRIX GRAPHIC MODULE, 1/16 DUTY, 1/5 BIAS. | |

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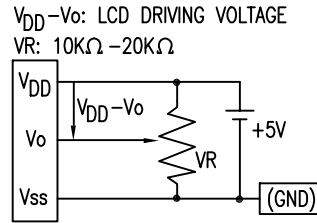
RELIABILITY NOTE
OUR MANY YEARS OF EXPERIENCE DATA ACCUMULATION INDICATE THAT SOLDER HEAT IS A MAJOR CAUSE OF EARLY AND FUTURE FAILURE. PLEASE PAY ATTENTION TO YOUR SOLDERING PROCESS.

LUMEX
INCORPORATED

290 E. HELLEN ROAD
PALATINE, ILLINOIS 60067
PHONE: 1-847-359-2790
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| | | | |
|--------------------|-------------|--------------|--------------|
| DRAWN BY: SA/BC | CHECKED BY: | APPROVED BY: | DATE: 4-6-98 |
| | | | PAGE: 1 OF 2 |
| | | | SCALE: N/A |

| PIN CONFIGURATION | | | FUNCTION | |
|-------------------|-----------------|--------|---|---------------|
| PIN NO. | SYMBOL | LEVEL | | |
| 1 | V _{SS} | - | POWER SUPPLY | GND (0V) |
| 2 | V _{DD} | - | | 5V |
| 3 | V _O | - | | FOR LCD DRIVE |
| 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 |



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

| 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 | DO~D7 | t _{DS6} | 80 | - | ns |
| DATA HOLD TIME | | t _{DH6} | 10 | - | ns |
| OUTPUT DISABLE TIME | | t _{OH6} | 10 | 60 | ns |
| ACCESS TIME | | t _{ACC6} | - | 90 | ns |
| ENABLE PULSE WIDTH | (READ) | E | t _{EW} | 100 | ns |
| | (WRITE) | | | 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** | HIGH | V _{IH} | 0.2 | - | V _{DD} | V |
| | LOW | V _{IL} | 0 | - | 0.8 | V |
| OUTPUT VOLTAGE*** | HIGH | V _{OH} | I _{OH} =-3mA | 2.4 | - | V |
| | LOW | 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 |
| | | | MIN | MAX | |
| 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

| | | | |
|---|------------------------------|---|--|
| REV. B | PART NUMBER LCM-X12232GXX | <p>CONFIDENTIAL INFORMATION</p> <p>THE INFORMATION CONTAINED IN THIS DOCUMENT IS THE PROPERTY OF LUMEX INC. EXCEPT AS SPECIFICALLY AUTHORIZED IN WRITING BY LUMEX INC., THE HOLDER OF THIS DOCUMENT SHALL KEEP ALL INFORMATION CONTAINED HEREIN CONFIDENTIAL AND SHALL PROTECT SAME IN WHOLE OR IN PART FROM DISCLOSURE AND DISSEMINATION TO ALL THIRD PARTIES.</p> <p>RELIABILITY NOTE</p> <p>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.</p> | <p>290 E. HELLEN ROAD PALATINE, ILLINOIS 60067 PHONE: 1-847-359-2790 WEB: HTTP://WWW.LUMEX.COM</p> |
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