

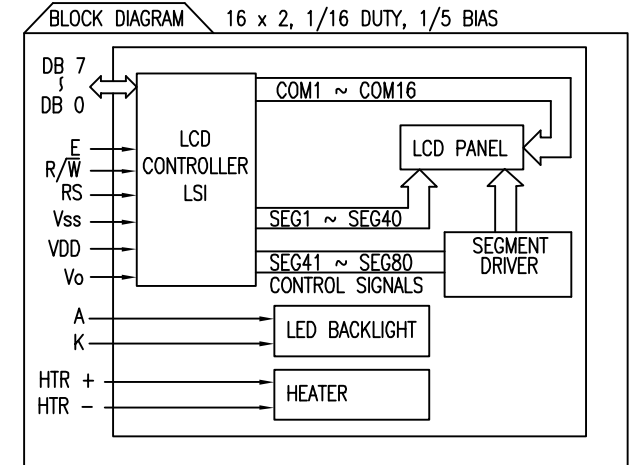
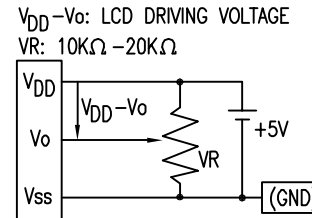
CAUTION: STATIC SENSITIVE DEVICE  
FOLLOW PROPER E.S.D. HANDLING PROCEDURES  
WHEN WORKING WITH THIS PART.

\*UNLESS OTHERWISE SPECIFIED TOLERANCES PER DECIMAL PRECISION ARE: X=±1 (±0.039), X.X=±0.5 (±0.020), X.XX=±0.25 (±0.010), X.XXX=±0.127 (±0.005). LEAD SIZE=±0.05 (±0.002), LEAD LENGTH=±0.75 (±0.030). MIN.= +DECIMAL PRECISION MAX.= +0.00 -0.00 -DECIMAL PRECISION

|   |                                  |  |   |
|---|----------------------------------|--|---|
| REV.  | PART NUMBER<br>LCR-U01602DSF/A-H | CONFIDENTIAL INFORMATION<br>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. | 290 E. HELEN ROAD<br>PALATINE, IL 60067-6976<br>PHONE: +1.847.359.2790<br>US WEB: www.lumex.com<br>TW WEB: www.lumex.com.tw |
| 4.35mm CHARACTER HEIGHT, 5 x 8 DOT MATRIX,<br>16 x 2 LCD MODULE, 1/16 DUTY, 1/5 BIAS. |                                  | RELIABILITY NOTE<br>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: JN<br>CHECKED BY:<br>APPROVED BY:<br>DATE: 11.13.09<br>PAGE: 1 OF 2<br>SCALE: N/A                                 |



| PIN CONFIGURATION |                 |        |   |
|-------------------|-----------------|--------|---|
| PIN NO.           | SYMBOL          | LEVEL  | FUNCTION  |
| 1                 | V <sub>SS</sub> | -      | POWER SUPPLY<br>GND (0V)  |
| 2                 | V <sub>DD</sub> | -      |   |
| 3                 | V <sub>O</sub>  | -      |   |
| 4                 | RS              | H/L    | REGISTER SELECT SIGNAL<br>H: DATA INPUT<br>L: INSTRUCTION INPUT |
| 5                 | R/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   |
| 17                | HTR +           | -      | +12V  |
| 18                | HTR -           | -      | GND (0V)  |



| 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                                 | -                     | 1.6  | 2.5  | mA              |
| INPUT VOLTAGE              | HIGH                             | V <sub>IH</sub>                                     | -                     | 2.2  | -    | V <sub>DD</sub> |
|                            | LOW                              | V <sub>IL</sub>                                     | -                     | 0    | -    | 0.6             |
| OUTPUT VOLTAGE             | HIGH                             | V <sub>OH</sub>                                     | -                     | 2.4  | -    | V               |
|                            | LOW                              | V <sub>OL</sub>                                     | -                     | -    | -    | 0.4             |
| *LED BACKLIGHT             | VOLTAGE                          | V <sub>f</sub>                                      | I <sub>f</sub> =120mA | -    | 4.2  | 4.6             |
|                            | CURRENT                          | I <sub>f</sub>                                      | -                     | -    | 120  | 200             |
|                            | POWER CONSUMPTION                | PD  | -                     | -    | -    | 552             |
|                            | LUMINOUS                         | L   | I <sub>f</sub> =120mA | 70   | -    | -               |
|                            | COLOR                            | -   | YELLOW / GREEN        | -    | -    | -               |
| HEATER                     | VOLTAGE                          | V <sub>fH</sub>                                     | -                     | -    | 12   | V               |
|                            | RESISTANCE                       | -   | -                     | -    | 11   | OHM             |
|                            | CURRENT                          | I <sub>H</sub>                                      | -                     | -    | 1.1  | AMP             |
|                            | POWER                            | PH  | -                     | -    | 13.1 | W               |

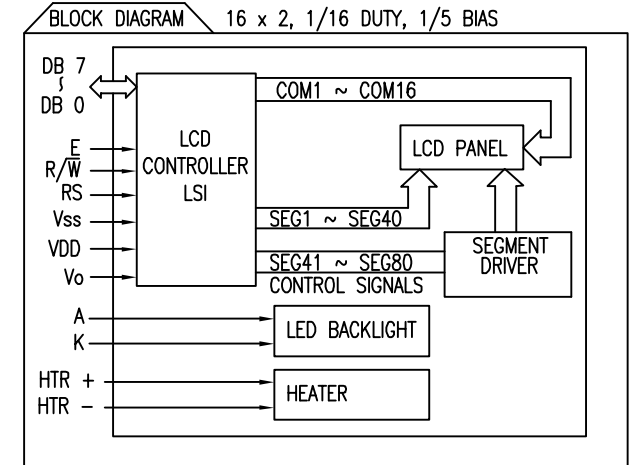
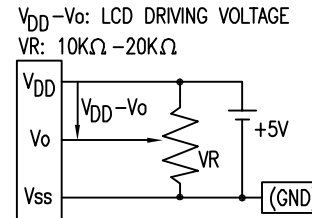
| ABSOLUTE MAXIMUM RATINGS     |                                  |                      |                 |                 |      |
|------------------------------|----------------------------------|----------------------|-----------------|-----------------|------|
| ITEM                         | 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>                 | LCR-U                | -40             | +85             | °C   |
| STORAGE TEMPERATURE          | T <sub>stg</sub>                 | LCR-U                | -40             | +85             | °C   |

\*UNLESS OTHERWISE SPECIFIED TOLERANCES PER DECIMAL PRECISION ARE: X=±1 (±0.039), X.X=±0.5 (±0.020), X.XX=±0.25 (±0.010), X.XXX=±0.127 (±0.005). LEAD SIZE=±0.05 (±0.002), LEAD LENGTH=±0.75 (±0.030). MIN.= +DECIMAL PRECISION -0.00 MAX.= +0.00 -DECIMAL PRECISION

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| PIN CONFIGURATION |                 |        |   |
|-------------------|-----------------|--------|---|
| PIN NO.           | SYMBOL          | LEVEL  | FUNCTION  |
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| 3                 | V <sub>O</sub>  | -      |   |
| 4                 | RS              | H/L    | REGISTER SELECT SIGNAL<br>H: DATA INPUT<br>L: INSTRUCTION INPUT |
| 5                 | R/W             | H/L    | H: DATA READ (MODULE-->MPU)<br>L: DATA WRITE (MODULE<--MPU)     |
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| 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                                 | -                     | 1.6  | 2.5  | mA                |                   |
| INPUT VOLTAGE              | HIGH                             | V <sub>IH</sub>                                     | -                     | 2.2  | -    | V <sub>DD</sub> V |                   |
|                            | LOW                              | V <sub>IL</sub>                                     | -                     | 0    | -    | 0.6 V             |                   |
| OUTPUT VOLTAGE             | HIGH                             | V <sub>OH</sub>                                     | -                     | 2.4  | -    | V                 |                   |
|                            | LOW                              | V <sub>OL</sub>                                     | -                     | -    | 0.4  | V                 |                   |
| *LED BACKLIGHT             | VOLTAGE                          | V <sub>f</sub>                                      | I <sub>f</sub> =120mA | -    | 4.2  | 4.6               | V                 |
|                            | CURRENT                          | I <sub>f</sub>                                      | -                     | -    | 120  | 200               | mA                |
|                            | POWER CONSUMPTION                | PD  | -                     | -    | -    | 552               | mW                |
|                            | LUMINOUS                         | L   | I <sub>f</sub> =120mA | 70   | -    | -                 | cd/m <sup>2</sup> |
|                            | COLOR                            | -   | YELLOW / GREEN        | -    | -    | -                 | nm                |
| HEATER                     | VOLTAGE                          | V <sub>fH</sub>                                     | -                     | -    | 12   | -                 | V                 |
|                            | RESISTANCE                       | -   | -                     | -    | 11   | -                 | OHM               |
|                            | CURRENT                          | I <sub>H</sub>                                      | -                     | -    | 1.1  | -                 | AMP               |
|                            | POWER                            | PH  | -                     | -    | 13.1 | -                 | W                 |

| 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>                 | LCR-U                | -40             | +85             | °C   |
| STORAGE TEMPERATURE          | T <sub>stg</sub>                 | LCR-U                | -40             | +85             | °C   |

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