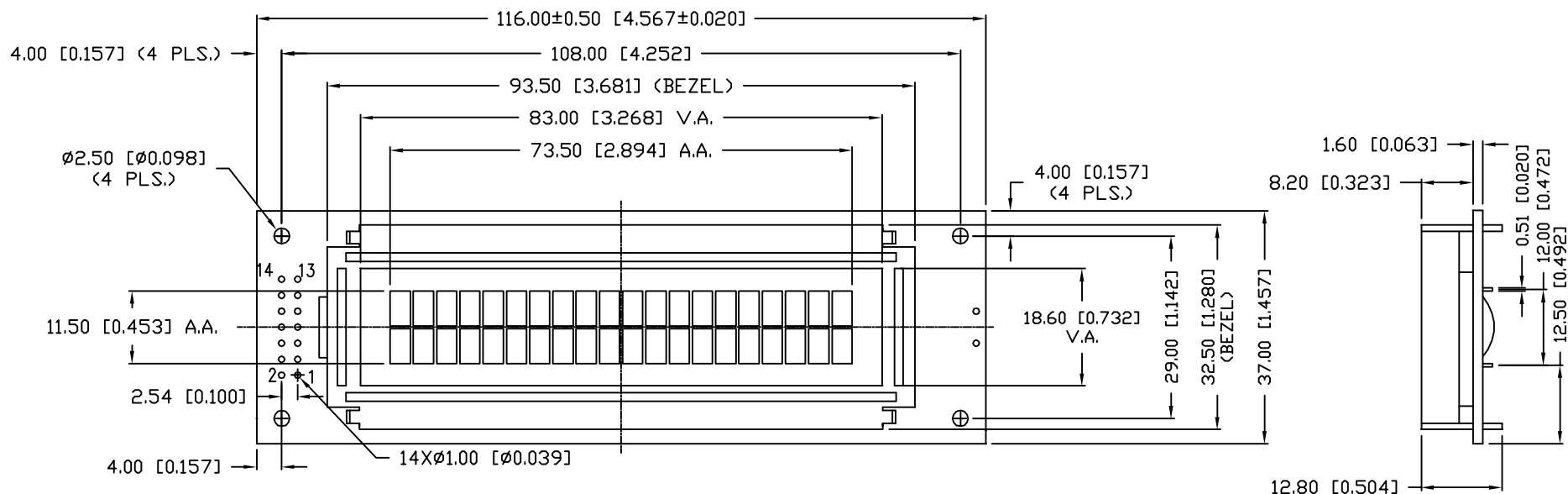
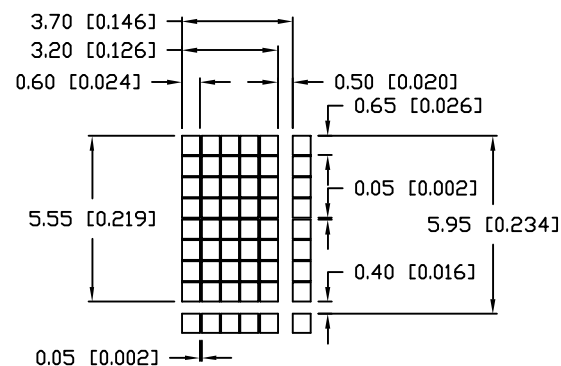


## CHARACTER DETAIL



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 -0.00 MAX.= +0.00 -DECIMAL PRECISION

REV.

PART NUMBER

LCR-U02002DSF-H

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

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## RELIABILITY NOTE

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DATE: 11.17.09

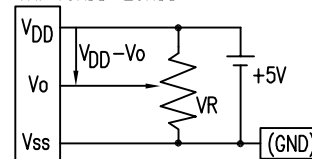
PAGE: 1 OF 2

SCALE: N/A

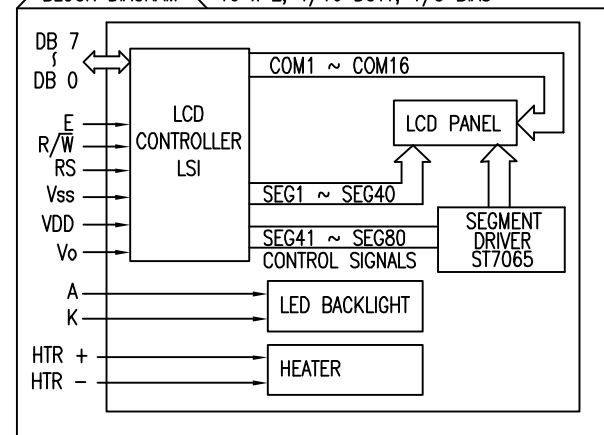
## PIN CONFIGURATION

| PIN NO. | SYMBOL          | LEVEL  | FUNCTION                                                        |
|---------|-----------------|--------|-----------------------------------------------------------------|
| 1       | V <sub>SS</sub> | -      | POWER SUPPLY                                                    |
| 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                                                           |
| 16      | K               | -      | CATHODE                                                         |
| 17      | HTR +           | -      | +12V                                                            |
| 18      | HTR -           | -      | GND (0V)                                                        |

V<sub>DD</sub>-V<sub>O</sub>: LCD DRIVING VOLTAGE  
VR: 10KΩ~20KΩ



## BLOCK DIAGRAM 16 x 2, 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 | -                     | 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  | V                 |
| *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                | P <sub>D</sub>      | -                     | -    | -    | 552               |
|                          | 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                            | P <sub>H</sub>      | -                     | -    | 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>                 | LCM-U                | -40             | +85             | °C   |
| STORAGE TEMPERATURE          | T <sub>stg</sub>                 | LCM-U                | -40             | +85             | °C   |

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