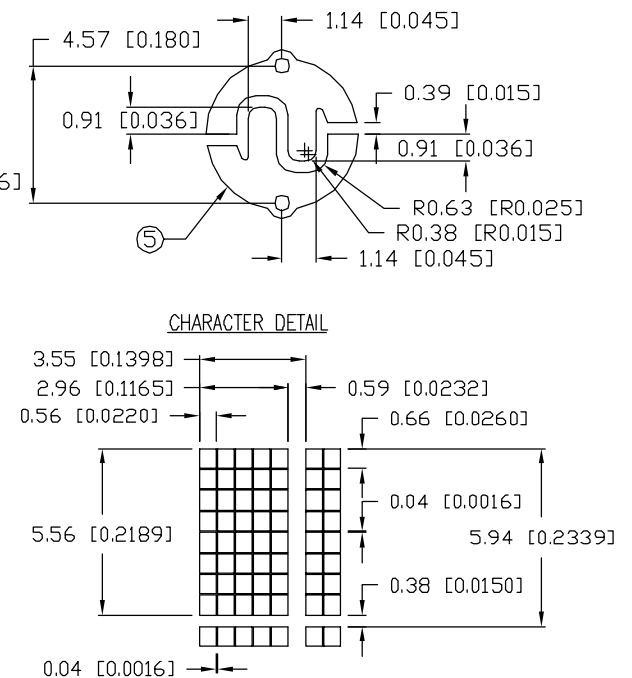
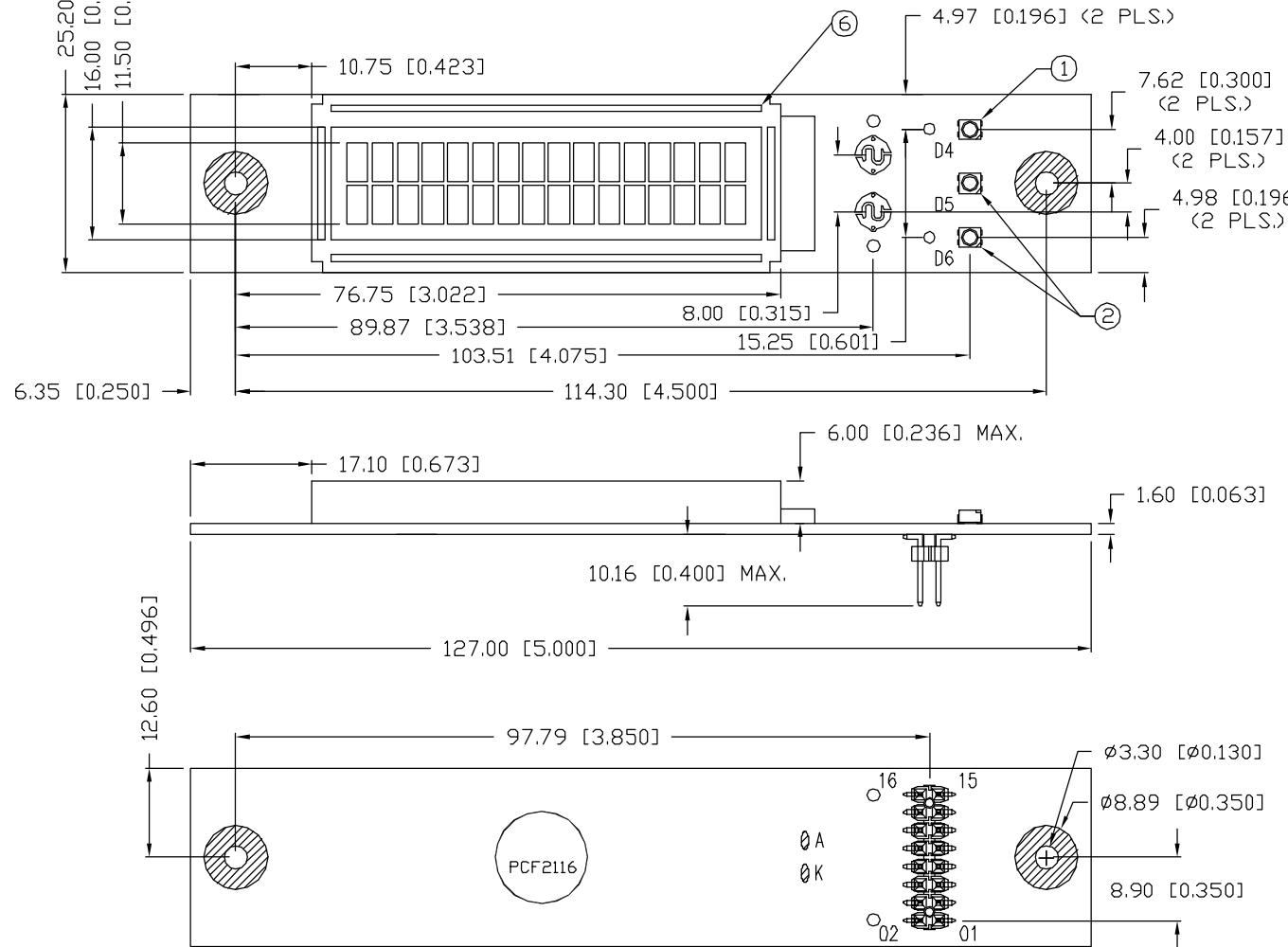


# PRELIMINARY IN P/N DIR

### PUSH BUTTON SWITCH SOLDER PAD LAYOUT:



### CHARACTER DETAIL

NOTES:

1. 1 RED/YELLOW BICOLOR LEDS, SML-LX2832IYC-TR.
2. 2 GREEN/YELLOW BICOLOR LEDS, SML-LX2832GYC-TR.
3. SAMTEC TSM-108-01-L-DV-A, CONNECTOR.
4. NPX LCD DRIVER: PCF2116.
5. THE BOTTOM PAD OF EACH SWITCH PAD SHOULD BE WIRED TO GROUND.
6. NICKEL PLATED BEZEL.

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REV.

PART NUMBER

P1

LCM-H01602D-Q39416

16 X 2 LCD CHARACTER MODULE, CUSTOM PCB ASSEMBLY,  
12:00 VIEW, -20°C TO 70°C OPERATING TEMP, STN NEGATIVE  
BLUE, WHITE LED BACKLIGHT, NPX PCF2116 LCD DRIVER.

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## RELIABILITY NOTE

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PLEASE PAY ATTENTION TO YOUR SOLDERING PROCESS.



290 E. HELEN ROAD  
PALATINE, IL 60067-6976  
PHONE: +1.847.359.2790  
US WEB: [www.lumex.com](http://www.lumex.com)  
TW WEB: [www.lumex.com.tw](http://www.lumex.com.tw)

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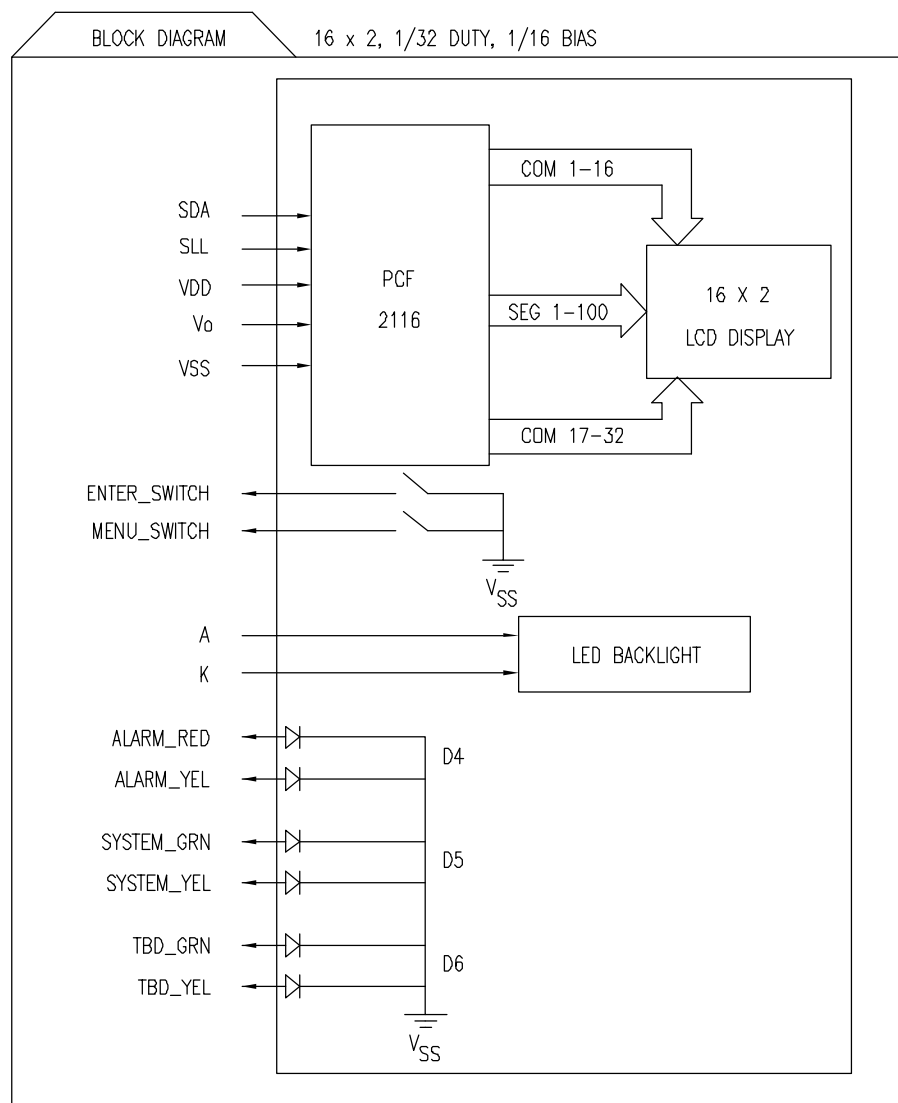
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PAGE: 1 OF 3

SCALE: N/A

PRELIMINARY IN P/N DIR



| PIN CONFIGURATION |              |                                                                                                        |
|-------------------|--------------|--------------------------------------------------------------------------------------------------------|
| PIN               | SYMBOL       | FUNCTION                                                                                               |
| 1                 | VSS          | GROUND (0V)                                                                                            |
| 2                 | VDD          | SUPPLY VOLTAGE FOR LOGIC (+4.2V - +4.8V)                                                               |
| 3                 | Vo           | THE INPUT LEVEL AT THIS PIN DETERMINES THE GENERATED VLCD OUTPUT VOLTAGE. (CONTRAST ADJUST, 0.5V TYP.) |
| 4                 | SDA          | INPUT/OUTPUT FOR THE I2C-BUS DATA LINE.                                                                |
| 5                 | SLC          | INPUT FOR THE I2C-BUS CLOCK SIGNAL.                                                                    |
| 6                 | RESET_L      | ACTIVE LOW RESET SIGNAL.                                                                               |
| 7                 | ENTER_SW     | SWITCH OUTPUT                                                                                          |
| 8                 | MENU_SW      | SWITCH OUTPUT                                                                                          |
| 9                 | ALARM_RED    | RED LED ANODE                                                                                          |
| 10                | ALARM_YEL    | YELLOW LED ANODE                                                                                       |
| 11                | SYSTEM_GREEN | GREEN LED ANODE                                                                                        |
| 12                | SYSTEM_YEL   | YELLOW LED ANODE                                                                                       |
| 13                | TBD_GREEN    | GREEN LED ANODE                                                                                        |
| 14                | TBD_YEL      | YELLOW LED ANODE                                                                                       |
| 15                | A            | LED BACK LIGHT ANODE                                                                                   |
| 16                | K            | LED BACK LIGHT CATHODE                                                                                 |

## NOTES:

1. D4 IS THE ALARM LED.
2. D5 IS THE SYSTEM LED.
3. D6 IS THE TBD LED.

UNCONTROLLED DOCUMENT

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PALATINE, IL 60067-6976  
PHONE: +1.847.359.2790  
US WEB: www.lumex.com  
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PAGE: 2 OF 3

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|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 0A | 0B | 40 | 41 | 42 | 43 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 2A | 2B | 60 | 61 | 62 | 63 |

DISPLAY POSITION

DDRAM ADDRESS

WHEN THE DISPLAY OPERATION IS PERFORMED, THE DDRAM ADDRESS MOVED AS FOLLOW: AFTER THE LEFT SHIFT INSTRUCTION

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 0A | 0B | 0C | 41 | 42 | 43 | 44 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 2A | 2B | 2C | 61 | 62 | 63 | 61 |

DISPLAY POSITION

DDRAM ADDRESS

AFTER THE RIGHT SHIFT INSTRUCTION

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 13 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 0A | 53 | 40 | 41 | 42 |
| 33 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 2A | 53 | 40 | 41 | 42 |

DISPLAY POSITION

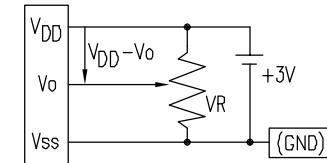
DDRAM ADDRESS

## AC CHARACTERISTICS

| SYMBOL       | PARAMETER                                  | STANDARD VALUE |      |      | UNIT    |
|--------------|--------------------------------------------|----------------|------|------|---------|
|              |                                            | MIN.           | TYP. | MAX. |         |
| $F_{SLC}$    | SLC CLOCK FREQUENCY                        | —              | —    | 100  | KHz     |
| $T_{SW}$     | TOLERABLE SPIKE WIDTH ON BUS               |                |      | 100  | ns      |
| $T_{BUF}$    | BUS FREE TIME                              | 4.7            |      |      | $\mu$ S |
| $T_{SU;STA}$ | SET-UP TIME FOR A REPEATED START CONDITION | 4.7            |      |      | $\mu$ S |
| $T_{HD;STA}$ | START CONDITION HOLD TIME                  | 4              |      |      | $\mu$ S |
| $T_{LOW}$    | SCL LOW TIME                               | 4.7            |      |      | $\mu$ S |
| $T_{HIGH}$   | SCL HIGH TIME                              | 4              |      |      | $\mu$ S |
| $T_R$        | SCL AND SDA RISE TIME                      | —              |      | 1    | $\mu$ S |
| $T_F$        | SLC AND SDA FALL TIME                      | —              |      | 0.3  | $\mu$ S |
| $T_{SU;DAT}$ | DATA SETUP TIME                            | 250            |      |      | ns      |
| $T_{HD;DAT}$ | DATA HOLD TIME                             | 0              |      |      | ns      |
| $T_{SU;STO}$ | SETUP TIME FOR STOP CONDITION              | 4              |      |      | $\mu$ S |

## ABSOLUTE MAXIMUM RATINGS

| ITEM                         | SYMBOL    | TEST CONDITION           | STANDARD VALUE |          | UNIT               |
|------------------------------|-----------|--------------------------|----------------|----------|--------------------|
|                              |           |                          | MIN            | MAX      |                    |
| SUPPLY VOLTAGE FOR LOGIC     | $V_{DD}$  | $T_a=25^{\circ}\text{C}$ | -0.5           | 8.0      | V                  |
| SUPPLY VOLTAGE FOR LCD DRIVE | $V_o$     | —                        | $V_{SS}$       | $V_{DD}$ | V                  |
| OPERATING TEMPERATURE        | $T_{opr}$ | LCM-S                    | -20            | 70       | $^{\circ}\text{C}$ |
| STORAGE TEMPERATURE          | $T_{stg}$ | LCM-S                    | -30            | 80       | $^{\circ}\text{C}$ |

 $V_{DD}-V_o$ : LCD DRIVING VOLTAGEVR: 10K $\Omega$ ~20K $\Omega$ 

## ELECTRICAL CHARACTERISTICS

 $V_{DD}=5\text{V}$ ,  $T_A=25^{\circ}\text{C}$ 

| ITEM              |                 | SYMBOL          | CONDITION             | STANDARD VALUE     |      |                    | UNIT |
|-------------------|-----------------|-----------------|-----------------------|--------------------|------|--------------------|------|
|                   |                 |                 |                       | MIN.               | TYP. | MAX.               |      |
| OPERATING VOLTAGE |                 | V <sub>DD</sub> | —                     | 3.0                | 3.3  | 3.6                | V    |
| SUPPLY CURRENT    |                 | I <sub>DD</sub> | —                     | —                  | TBD  | —                  | mA   |
| INPUT VOLTAGE     |                 | I <sub>IL</sub> |                       | V <sub>SS</sub>    | —    | 0.3V <sub>DD</sub> |      |
|                   |                 | V <sub>OH</sub> |                       | 0.7V <sub>DD</sub> | —    | V <sub>DD</sub>    | V    |
| LED BACKLIGHT     | FORWARD CURRENT | I <sub>F</sub>  | V <sub>F</sub> = 3.4  | —                  | 30   | 40                 | mA   |
|                   | COLOR           | X               | I <sub>F</sub> = 30mA | 0.287              | —    | 0.330              | mA   |
|                   |                 | Y               | I <sub>F</sub> = 30mA | 0.276              | —    | 0.339              | mA   |

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