



# ALL SHORE INDUSTRIES, INC.

## SPECIFICATION FOR LIQUID CRYSTAL DISPLAY MODULE

**MODULE # : ASI-E-162DS-GC-\_S/W**

(1)	NUMBER OF CHARACTER	-----	16 CH X 2 LINES
(2)	MODULE SIZE	-----	85.0W X 36.0H X 10.0T (max.) mm
(3)	EFFECTIVE AREA	-----	64.5W X 16.0H mm
(4)	CHARACTER FONT	-----	5 X 7 DOTS + CURSOR
(5)	CHARACTER SIZE	-----	2.96W X 4.86H mm
(6)	CHARACTER PITCH	-----	3.55 mm
(7)	DOT SIZE	-----	0.56W X 0.66H mm
(8)	DOT PITCH	-----	0.60W X 0.70H mm
(9)	LCD TYPE	-----	STN GRAY, YELLOW
(10)	DRIVING METHOD	-----	1 / 16 DUTY MULTIPLEX DRIVE
(11)	VIEWING DIRECTION	-----	6 OR 12 O 'CLOCK
(12)	BACK - LIGHT	-----	NONE



**MODEL NO : ASI-E-162DS-GC-\_S-/W**

RECORDS OF REVISION		DOC . FIRST ISSUE October, 2002
DATE	REVISED DRAWING NO.	SUMMARY



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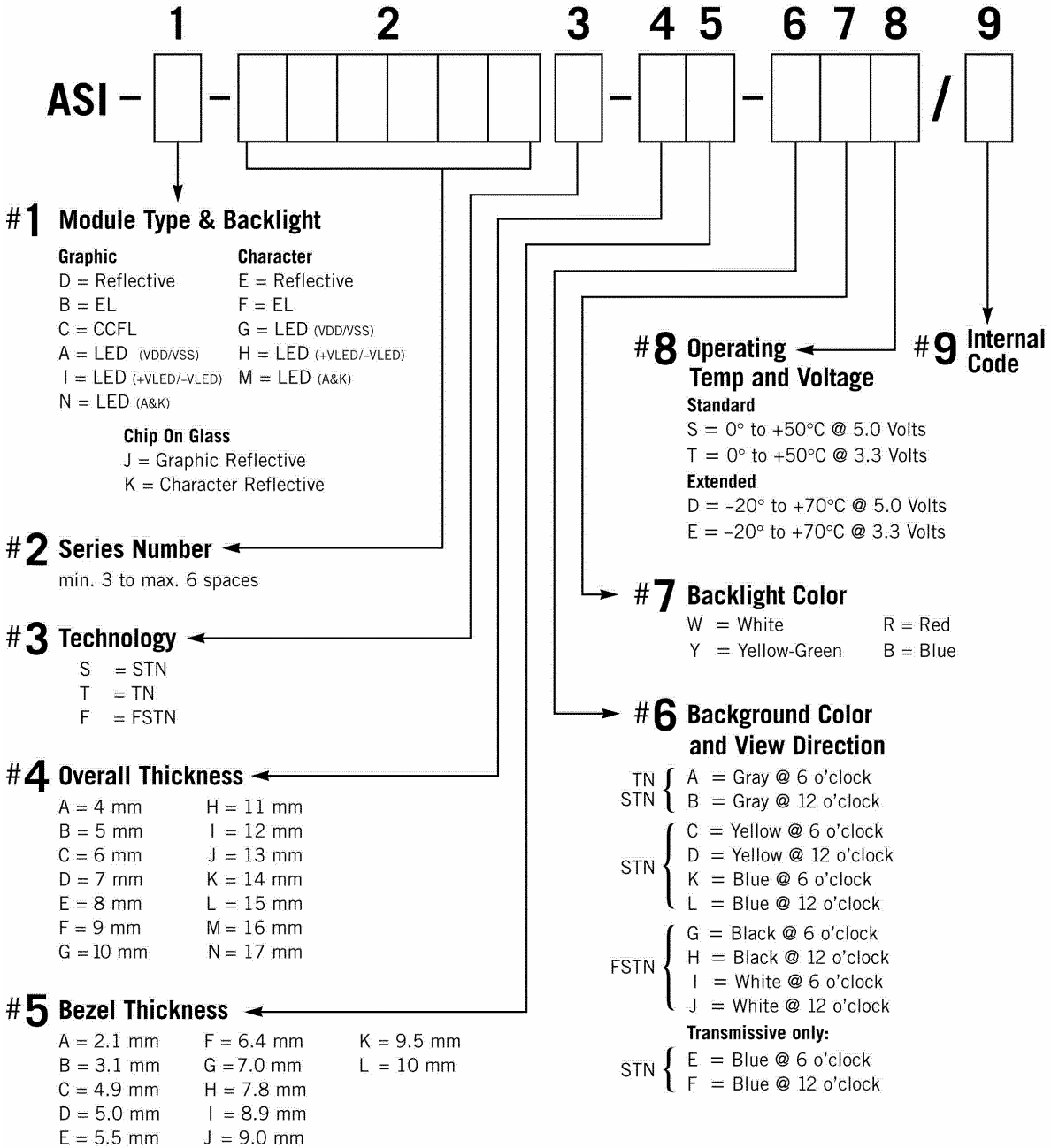
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**LCD MODULE PART NUMBERING SYSTEM**



NOTE: Some options may not be available in specific modules. Please contact your Sales Representative to check availability.



## MODEL NO : ASI-E-162DS-GC-\_S-/W

### 1. GENERAL SPECIFICATIONS

#### 1.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

**AS - 002A**

#### 1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER : HD44780U

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

AS-HD44780U

1.3 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS .

### 2. MECHANICAL SPECIFICATIONS

(1)	NUMBER OF CHARACTER -----	16 CH X 2 LINES
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### 3. ABSOLUTE MAXIMUM RATINGS

#### 3.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS . ( AT Ta = 25°C )

<i>I T E M</i>	<i>SYMBOL</i>	<i>MIN.</i>	<i>MAX.</i>	<i>UNIT</i>	<i>COMMENT</i>
POWER SUPPLY FOR LOGIC	V <sub>DD</sub> -V <sub>SS</sub>	0	6.0	V	-----
INPUT VOLTAGE	V <sub>I</sub>	V <sub>SS</sub>	V <sub>DD</sub>	V	-----
STATIC ELECTRICITY	-----	-----	100	V	NOTE (1)

NOTE (1): ELECTRO-STATIC DISCHARGE RESISTANCE IS TESTED BY CHARGING A 200PF CAPACITOR AND DISCHARGING IT BY CONTACT WITH A INTERFACE CONNECTOR PIN.

#### 3.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS .

<i>I T E M</i>	<i>OPERATING</i>		<i>STORAGE</i>		<i>COMMENT</i>
	<i>MIN.</i>	<i>MAX.</i>	<i>MIN.</i>	<i>MAX.</i>	
AMBIENT TEMPERATURE	0°C	50°C	-20°C	70°C	-----
HUMIDITY	NOTE (2)		NOTE (2)		NO CONDENSATION
VIBRATION NOTE (3)	-----	0.5G	-----	2G	10 ~ 300Hz XYZ DIRECTIONS 1 Hr EACH
SHOCK NOTE (3)	-----	3G	-----	50G	10 msec XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		-----

NOTE (2) : Ta ≤ 50°C: 85%RH MAX.

Ta > 50°C: ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 85% RH AT 50°C. (50%RH AT 60°C)

NOTE (3): 1G = 9.8 m/s<sup>2</sup>



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### 4. ELECTRICAL CHARACTERISTICS

Ta = 25°C

VDD = 5.0 +/- 0.25 V

<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>
INPUT VOLTAGE	V <sub>IH</sub>	-----	2.2	-----	-----	V
	V <sub>IL</sub>		-----	-----	0.6	V
OUTPUT VOLTAGE (H LEVEL)	V <sub>OH</sub>	-I <sub>OH</sub> = 0.2mA	2.4	-----	-----	V
	V <sub>OL</sub>	I <sub>OL</sub> = 1.2 mA	-----	-----	0.4	V
POWER SUPPLY CURRENT	I <sub>DD</sub>	V <sub>DD</sub> = 5.0V	-----	1.0	1.5	mA
RECOMMENDED LCD DRIVING VOLTAGE	V <sub>DD</sub> -V <sub>O</sub> DUTY= 1/16 Φ = 10°	Ta = 0°C	-----	5.0	-----	V
		Ta = 25°C	-----	4.5	-----	V
		Ta = 50°C	-----	4.1	-----	V

NOTE (1): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTEDUATE ABOUT ±0.5V BY EACH MODULE.

### 5. OPTICAL CHARACTERISTICS

Ta = 25 °C VDD = 5.0 V

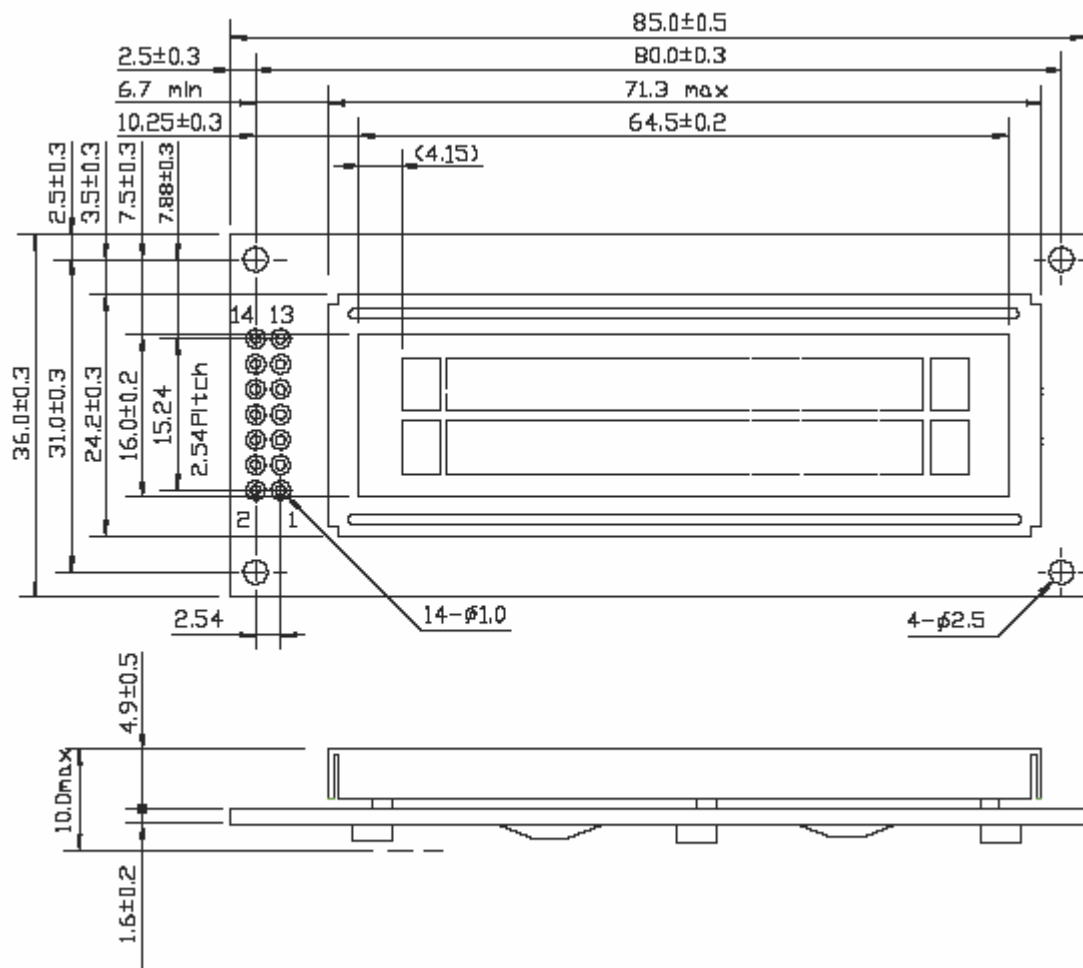
<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>	<i>NOTE</i>
VIEWING ANGLE	Φ <sub>2</sub> -Φ <sub>1</sub>	K = 2.0	30	40	-----	deg.	2
CONTRAST RATIO	K	Φ = 10° θ = 0°	-----	4.0	-----	-----	2
RESPONSE TIME	tr (rise)	Φ = 10° θ = 0°	-----	250	400	ms	2
	tf (fall)	Φ = 10° θ = 0°	-----	350	450	ms	2

NOTE (2): SEE CUSTOMER ACCEPTANCE STANDARD SPECIFICATION FOR DEFINITION OF OPTICAL CHARACTERISTICS.

NOTE (3): UNDER NORMAL TEMPERATURE AND HUMIDITY IN A DARK ROOM.

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**6. OUTLINE DIMENSION**



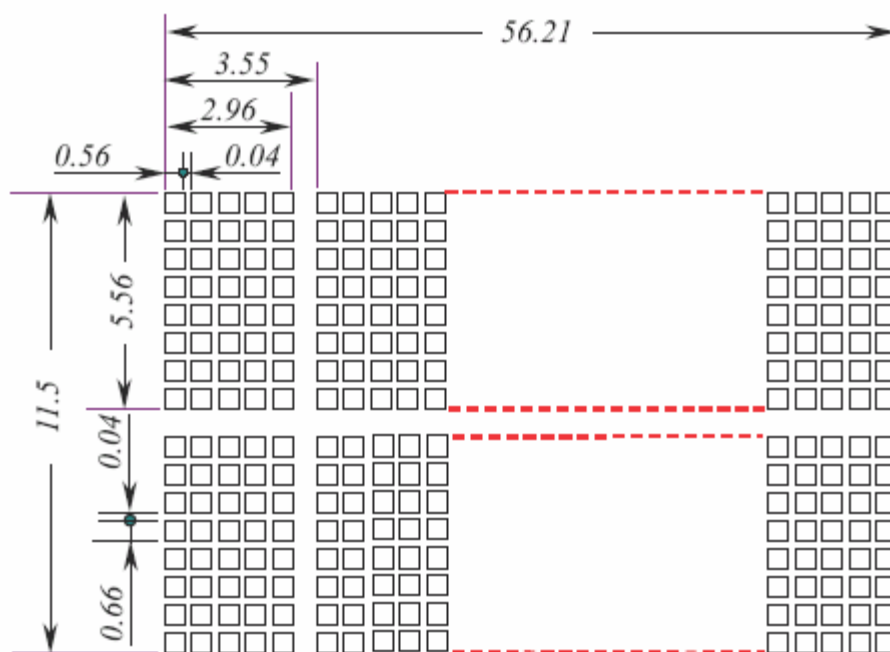
*Interface pin connection*

<b>PIN NO.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>SYMBOL</b>	V <sub>SS</sub>	V <sub>DD</sub>	V <sub>O</sub>	RS	R/ $\overline{W}$	E	DB0
<b>PIN NO.</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
<b>SYMBOL</b>	DB1	DB2	DB3	DB4	DB5	DB6	DB7

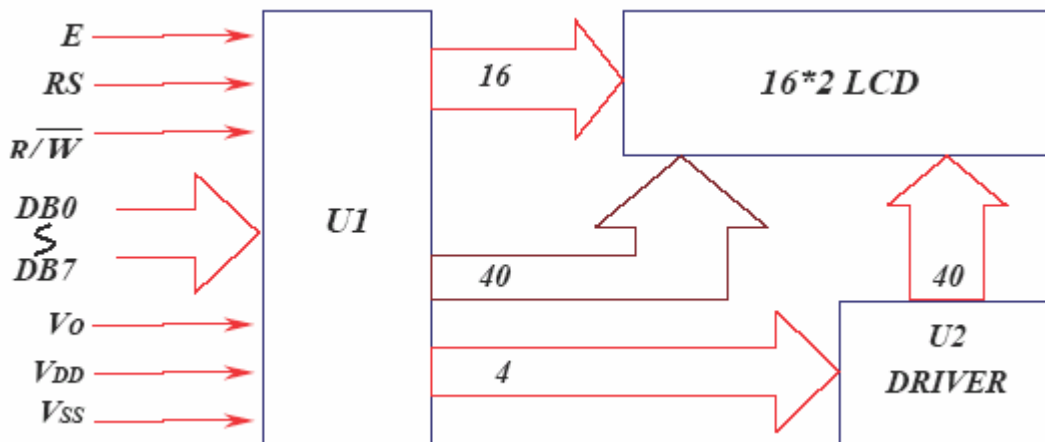


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7. DETAIL DRAWING OF DOT MATRIX



8. BLOCK DIAGRAM



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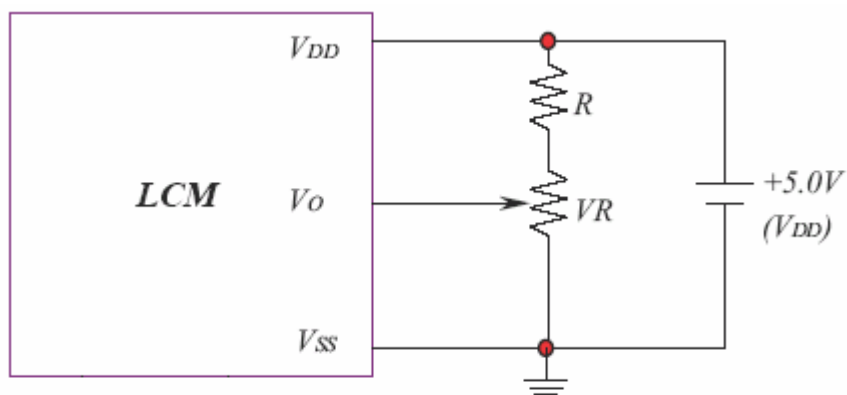
### 9.0 DISPLAY DATA ADDRESS CHARTS

#### *Display data address charts*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE 1	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
LINE 2	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF

### 10. POWER SUPPLY

#### 10.1 POWER SUPPLY FOR LCM



RECOMMENDED RESISTOR R:  $V_{DD} - V_o \geq 1.5V$

$V_{DD} - V_o$ : LCD DRIVING VOLTAGE

VR:  $10K\Omega \sim 20K\Omega$