



# ALL SHORE INDUSTRIES, INC.

## SPECIFICATION FOR LIQUID CRYSTAL DISPLAY MODULE

**MODULE #: ASI-\_-202AS-KK-\_YS/W**

- (1) NUMBER OF CHARACTERS-----20 CH \* 2 LINE
- (2) MODULE SIZE -----116.0 W \* 37.0 H \* 14.0 T (Max) mm
- (3) EFFECTIVE AREA-----82.2 W \* 18.6 H mm
- (4) CHARACTER PATTERN-----5 \* 7 DOTS + CURSOR
- (5) CHARACTER SIZE-----3.2 W \* 4.85H mm
- (6) CHARACTER PITCH-----3.7 mm
- (7) DOT SIZE -----0.60 W \* 0.65 H mm
- (8) DOT PITCH-----0.65 W \* 0.70 H mm



**MODEL NO : ASI-\_-202AS-KK-\_YS/W**



**MODEL NO : ASI-\_-202AS-KK-\_YS/W**

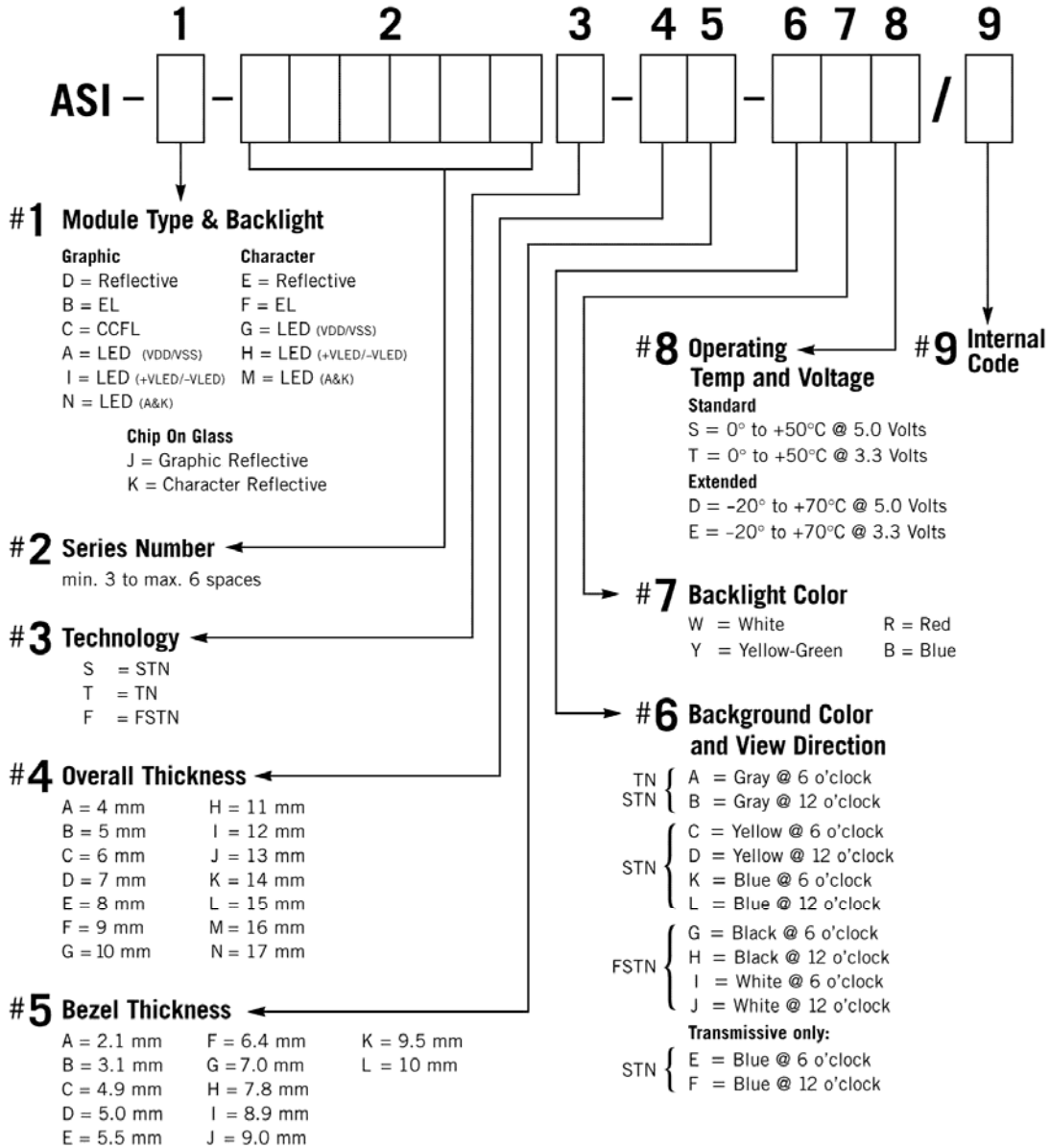
**RECORD OF REVISION**

<b>DATE</b>	<b>PAGE</b>	<b>SUMMARY</b>
2004/6/25	3/9	ADD the "R" REFLECTIVE of (6).BACKLIGHT TYPE
	8/9	ADD the table to distribute LCM type LED B.L and NO B.L
	8/9	ADD the 15th and 16th pins of Interface pin connection.



MODEL NO : ASI-\_-202AS-KK-\_YS/W

## 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-\_-202AS-KK-\_YS/W**

***General specifications***

***General specifications***

*PLEASE REFER TO:*

*“CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-0069)”.*

***Mechanical data***

- (1) NUMBER OF CHARACTERS-----20 CH \* 2 LINE
- (2) MODULE SIZE -----116.0 W \* 37.0 H \* 14.0 T (Max) mm
- (3) EFFECTIVE AREA-----82.2 W \* 18.6 H mm
- (4) CHARACTER PATTERN-----5 \* 7 DOTS + CURSOR
- (5) CHARACTER SIZE -----3.2 W \* 4.85H mm
- (6) CHARACTER PITCH-----3.7 mm
- (7) DOT SIZE -----0.60 W \* 0.65 H mm
- (8) DOT PITCH-----0.65 W \* 0.70 H mm



## MODEL NO : ASI-\_-202AS-KK-\_YS/W

### *Absolute maximum ratings*

#### *Electrical absolute maximum ratings*

<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)
POWER SUPPLY FOR LED	V <sub>LED</sub>	-----	6.0	V	-----

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

#### *Environmental absolute maximum ratings*

<i>I T E M</i>	<i>CONDITION</i>	<i>OPERATING</i>		<i>STORAGE</i>		<i>COMMENT</i>
		<i>MIN.</i>	<i>MAX.</i>	<i>MIN.</i>	<i>MAX.</i>	
AMBIENT TEMPERATURE	NORMAL	0°C	50°C	-20°C	70°C	-----
	WIDE	-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): T<sub>a</sub> ≤ 50°C: 90% RH MAX.

T<sub>a</sub> > 50°C: ABSOLUTE HUMIDITY MUST BE LOWER THAN THE  
HUMIDITY OF 90% RH AT 50°C. (80%RH AT 60°C)

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

## MODEL NO : ASI-\_-202AS-KK-\_YS/W

### Electrical characteristics

 $T_a = 25^{\circ}\text{C}$ 
 $V_{DD} = 5.0\text{V} \pm 0.25\text{V}$ 

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
INPUT VOLTAGE	$V_{IH}$	-----	2.0	-----	-----	V	
	$V_{IL}$	-----	-----	-----	0.8	V	
OUTPUT VOLTAGE	$V_{OH}$	$-I_{OH} = 0.2\text{ mA}$	2.4	-----	-----	V	
	$V_{OL}$	$I_{OL} = 1.6\text{ mA}$	-----	-----	0.4	V	
POWER SUPPLY CURRENT	$I_{DD}$	$V_{DD} = 5.0\text{V}$	-----	2.0	3.5	mA	
RECOMMENDED LCD DRIVING VOLTAGE, NOTE(1), NOTE(3)-A	$V_{DD}-V_O$	DUTY =1/16 $\Phi=10^{\circ}$ NOTE(2)	$T_a = -20^{\circ}\text{C}$	-----	4.8	-----	V
			$T_a = 0^{\circ}\text{C}$	-----	4.7	-----	V
			$T_a = 25^{\circ}\text{C}$	-----	4.5	-----	V
			$T_a = 50^{\circ}\text{C}$	-----	4.3	-----	V
			$T_a = 70^{\circ}\text{C}$	-----	4.2	-----	V
RECOMMENDED LCD DRIVING VOLTAGE, NOTE(1), NOTE(3)-B	$V_{DD}-V_O$	DUTY =1/16 $\Phi=10^{\circ}$ NOTE(2)	$T_a = -20^{\circ}\text{C}$	-----	4.5	-----	V
			$T_a = 0^{\circ}\text{C}$	-----	4.4	-----	V
			$T_a = 25^{\circ}\text{C}$	-----	4.2	-----	V
			$T_a = 50^{\circ}\text{C}$	-----	4.0	-----	V
			$T_a = 70^{\circ}\text{C}$	-----	3.9	-----	V
RECOMMENDED LCD DRIVING VOLTAGE NOTE(1)	$V_{DD}-V_O$	TN DUTY =1/16 $\Phi=25^{\circ}$ NOTE(2)	$T_a = -20^{\circ}\text{C}$	-----	4.5	-----	V
			$T_a = 0^{\circ}\text{C}$	-----	4.4	-----	V
			$T_a = 25^{\circ}\text{C}$	-----	4.2	-----	V
			$T_a = 50^{\circ}\text{C}$	-----	4.0	-----	V
			$T_a = 70^{\circ}\text{C}$	-----	3.9	-----	V
POWER SUPPLY CURRENT FOR LED	$I_{LED}$	5.0V	-----	120	250	mA	

NOTE(1): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT  $\pm 0.5\text{V}$  BY EACH MODULE.

NOTE(2):  $\theta = 0^{\circ}$  : VIEWING DIRECTION AT 6 O'CLOCK  
 $\theta = 180^{\circ}$  : VIEWING DIRECTION AT 12 O'CLOCK

NOTE(3): RECOMMENDED LCD DRIVING VOLTAGE FOR DIFFERENT LCD TYPE

	LCD TYPE	LCD COLOR	LCD POLARIZE TYPE
A	STN	GRAY/ BLUE(NEGATIVE)	TRANSFLECTIVE TRANSMISSIVE
	FSTN	BLACK(NEGATIVE) WHITE(POSITIVE)	
B	STN	YELLOW-GREEN	TRANSFLECTIVE TRANSMISSIVE



## MODEL NO : ASI-\_-202AS-KK-\_YS/W

### Optical characteristics

#### TN TYPE LCD

 $T_a = 25\text{ }^\circ\text{C}$   $V_{DD}-V_O=4.2V$ 

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	$\Phi_2-\Phi_1$	K = 1.4 NOTE(1)	20	30	----	deg.	NOTE(2)
CONTRAST RATIO	K	$\Phi = 25^\circ$ NOTE(1)	2.0	3.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	$\Phi = 25^\circ$ NOTE(1)	----	150	250	ms	NOTE(2)
	tf (fall)	$\Phi = 25^\circ$ NOTE(1)	----	150	250	ms	NOTE(2)

#### STN TYPE LCD

 $T_a = 25\text{ }^\circ\text{C}$   $V_{DD}-V_O=4.2V$ 

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	$\Phi_2-\Phi_1$	K = 2.0 NOTE(1)	30	40	----	deg.	NOTE(2)
CONTRAST RATIO	K	$\Phi = 10^\circ$ NOTE(1)	3.0	4.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	$\Phi = 10^\circ$ NOTE(1)	----	200	350	ms	NOTE(2)
	tf (fall)	$\Phi = 10^\circ$ NOTE(1)	----	300	400	ms	NOTE(2)

#### FSTN, STN BLUE TYPE LCD

 $T_a = 25\text{ }^\circ\text{C}$   $V_{DD}-V_O=4.5V$ 

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	$\Phi_2-\Phi_1$	K = 2.0 NOTE(1)	30	40	----	deg.	NOTE(2)
CONTRAST RATIO	K	$\Phi = 10^\circ$ NOTE(1)	4.0	5.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	$\Phi = 10^\circ$ NOTE(1)	----	200	350	ms	NOTE(2)
	tf (fall)	$\Phi = 10^\circ$ NOTE(1)	----	300	400	ms	NOTE(2)

#### Brightness for LCM backlight

SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	LED TYPE	NOTE
B	$\Phi = 0^\circ$ $\theta = 0^\circ$	5.0	----	----	cd/m <sup>2</sup>	YELLOW-GREEN, RED AMBER, ORANGE	NOTE(2) NOTE(3)

NOTE (1):  $\theta = 0^\circ$  : VIEWING DIRECTION AT 6 O'CLOCK

$\theta = 180^\circ$  : VIEWING DIRECTION AT 12 O'CLOCK

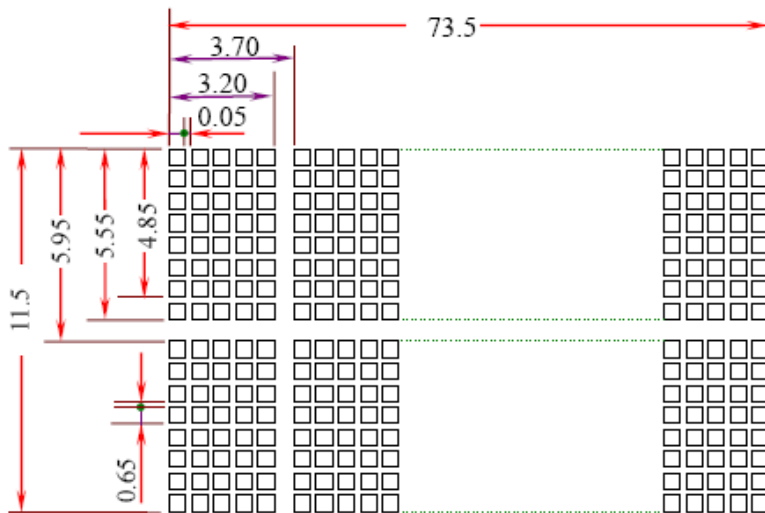
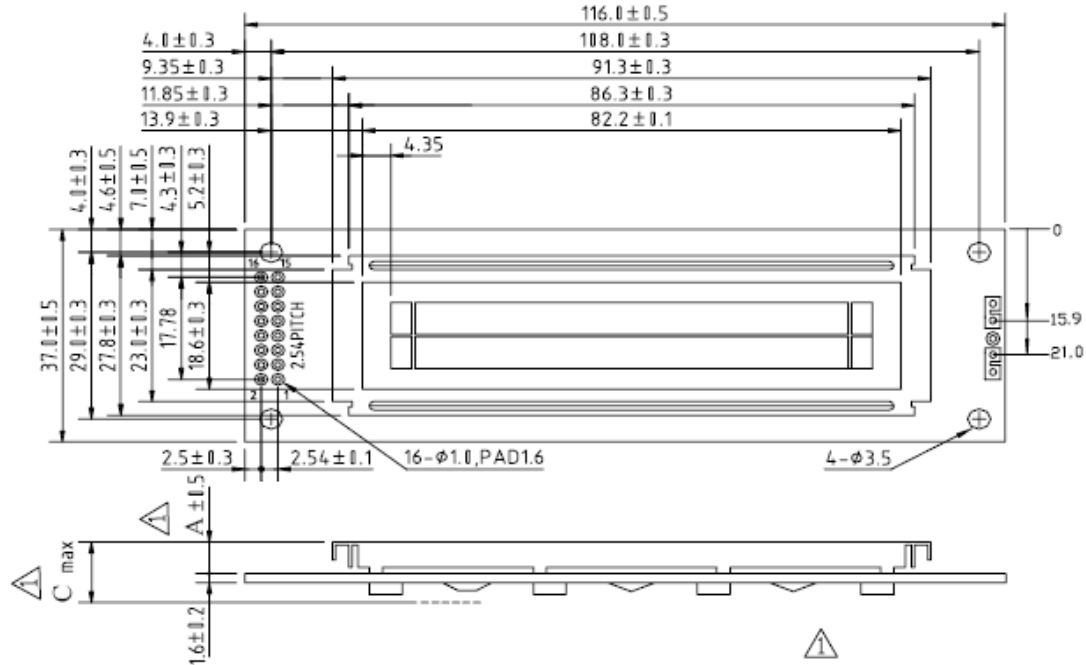
NOTE (2): SEE CUSTOMER ACCEPTANCE STANDARD SPECIFICATION FOR DEFINITION OF OPTICAL CHARACTERISTICS.

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



**MODEL NO : ASI-\_-202AS-KK-\_YS/W**

**Outline dimension**



TYPE	A	C
LED B.L	9.5	14
NO B.L	4.9	9.0

UNIT : mm  
SCALE : NTS

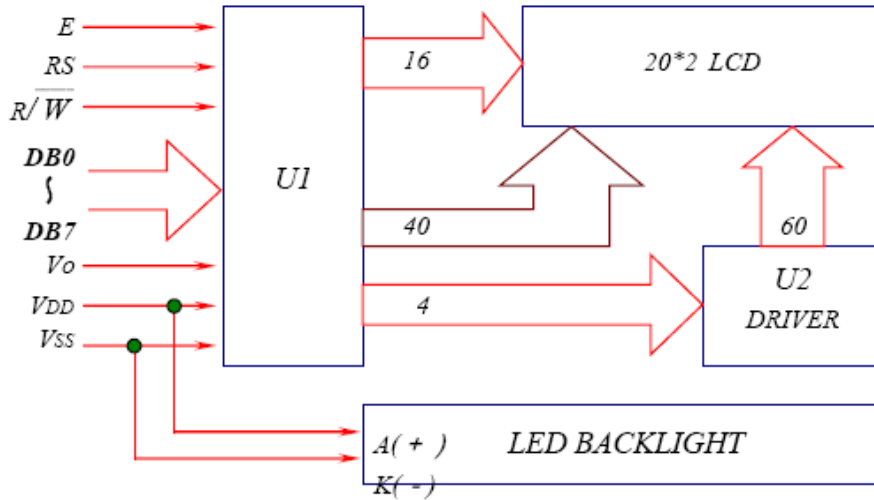
**Interface pin connection**

<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>8</b>
SYMBOL	V <sub>SS</sub>	V <sub>DD</sub>	V <sub>O</sub>	RS	R/ $\bar{W}$	E	DB0	DB1
<b>PIN NO.</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
SYMBOL	DB2	DB3	DB4	DB5	DB6	DB7	N.C	N.C



**MODEL NO : ASI-\_-202AS-KK-\_YS/W**

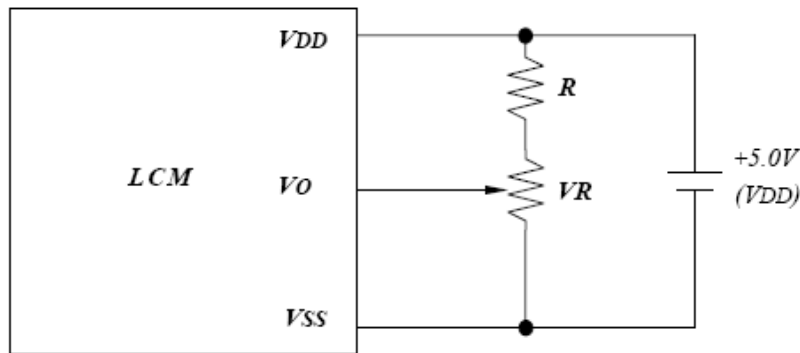
*Block diagram*



*Display data address charts*

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
LINE1	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	10	11	12	13
LINE2	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F	50	51	52	53

*Power supply for LCM*



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

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

VR: 10KΩ~ 20KΩ



**MODEL NO : ASI-\_-202AS-KK-\_YS/W**

The information presented in this datasheet has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies. Information contained herein is for selection purposes only, and is subject to change without notice. Please contact ASI for current datasheets prior to designing.

**All Shore Industries, Inc. One Edgewater Plaza, Staten Island, NY 10305**