



# ALL SHORE INDUSTRIES, INC.

## SPECIFICATION FOR LIQUID CRYSTAL DISPLAY MODULE

**MODULE #: ASI-D-1286A\_-GD-\_SW**

- (1) NUMBER OF DOTS-----128 W \* 64 H DOTS
- (2) MODULE SIZE -----93.0 W \* 70.0 H \* "C" T (Max) mm
- (3) EFFECTIVE AREA -----71.0 W \* 39.0 H mm
- (4) ACTIVE AREA -----66.52 W \* 33.24 H mm
- (5) DOT SIZE-----0.48 W \* 0.48 H mm
- (6) DOT PITCH-----0.52 W \* 0.52 H mm



**MODEL NO : ASI-D-1286A\_-GD-\_S/W**

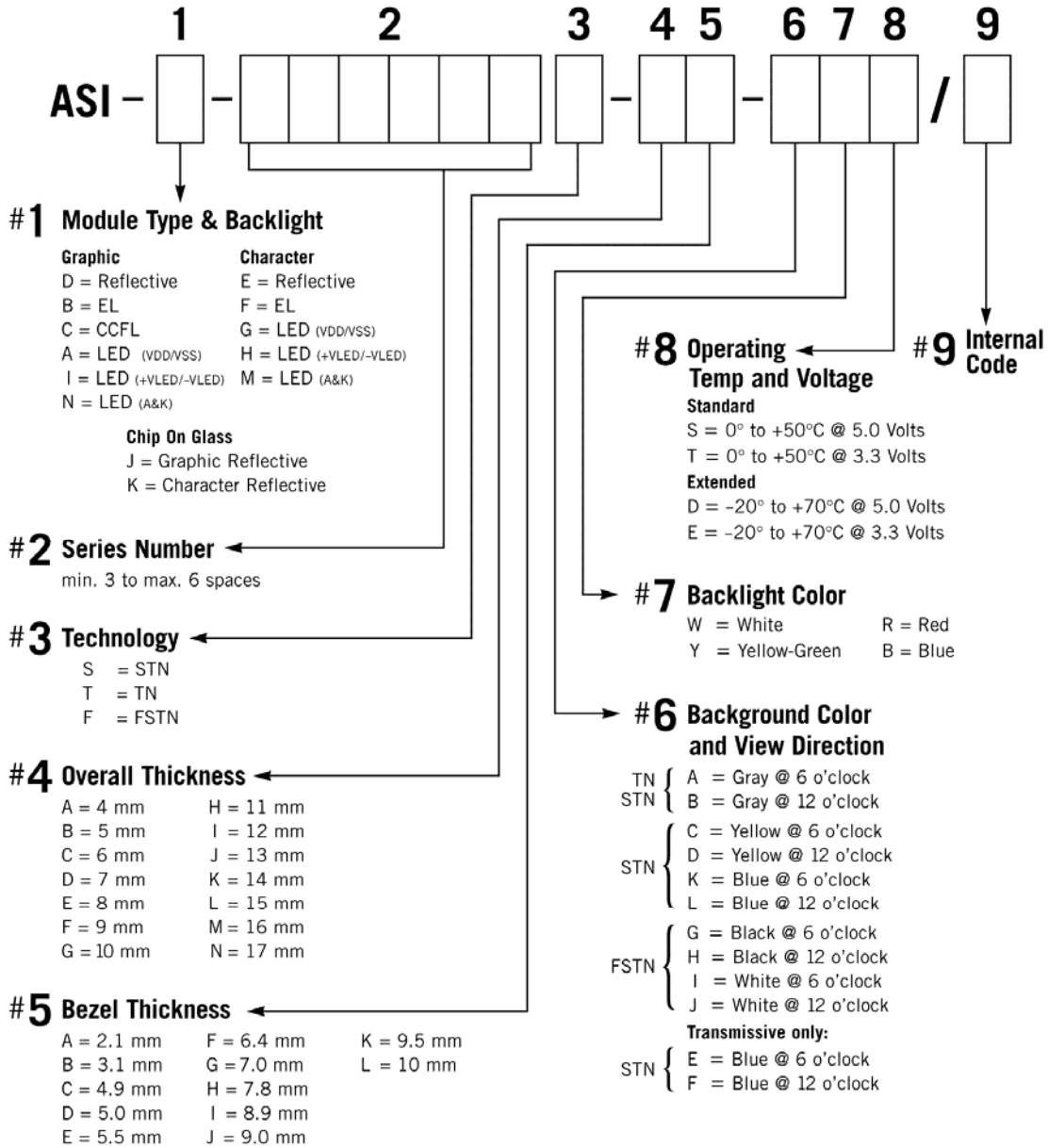
**RECORD OF REVISION**

<b>DATE</b>	<b>PAGE</b>	<b>SUMMARY</b>



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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-D-1286A\_-GD-\_S/W**

**3. General specifications**

**3.1 General specifications**

PLEASE REFER TO:

“CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-0108)”.

**3.2 This individual specification is prior to general specifications**

**4.Mechanical data**

- (1) NUMBER OF DOTS-----128 W \* 64 H DOTS
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***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>	-----	NOTE(2)	V	-----

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

NOTE (2):

<i>SYMBOL</i>	<i>V<sub>LED</sub> MAX.</i>	<i>LED TYPE</i>
V <sub>LED</sub>	6.0V	YELLOW-GREEN,AMBER,ORANGE,RED
	5.0V	WHITE, BLUE, PURE-GREEN

***5.2 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 (3)		NOTE (3)		NO CONDENSATION
VIBRATION NOTE (4)	-----	-----	0.5G	-----	2G	10~300HZ XYZ DIRECTIONS 1 Hr EACH
SHOCK NOTE (4)	-----	-----	3G	-----	50G	10 msec XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE			NOT ACCEPTABLE		-----

NOTE (3): 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 (4): 1G = 9.8 m/s<sup>2</sup>


**MODEL NO : ASI-D-1286A\_-GD-\_S/W**
*Electrical characteristics*
 $T_a = 25^\circ\text{C}$ 
 $V_{DD} = 5.0\text{V} \pm 0.25\text{V}$ 

<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>	
POWER SUPPLY VOLTAGE FOR CIRCUIT	$V_{DD}-V_{SS}$	-----	4.75	5.0	5.25	V	
INPUT VOLTAGE NOTE (2)	$V_{IH}$	H LEVEL	$0.7V_{DD}$	-----	$V_{DD}$	V	
	$V_{IL}$	L LEVEL	$V_{SS}$	-----	$0.3V_{DD}$	V	
OUTPUT VOLTAGE NOTE (1)	$V_{OH}$	$I_{OH} = -0.4\text{ mA}$	$V_{DD}-0.4$	-----	-----	V	
	$V_{OL}$	$I_{OL} = 0.4\text{ mA}$	-----	-----	0.4	V	
POWER SUPPLY CURRENT, NOTE (3)	$I_{DD}$	$V_{DD}-V_{SS} = 5.0\text{V}$	-----	5.0	8.0	mA	
RECOMMENDED LCD DRIVING VOLTAGE, NOTE(4)	$V_{DD}-V_O$	STN/ FSTN DUTY =1/64 $\Phi=10^\circ$ NOTE(5)	$T_a = -20^\circ\text{C}$	-----	8.9	-----	V
			$T_a = 0^\circ\text{C}$	-----	8.7	-----	V
			$T_a = 25^\circ\text{C}$	-----	8.5	-----	V
			$T_a = 50^\circ\text{C}$	-----	8.3	-----	V
			$T_a = 70^\circ\text{C}$	-----	8.1	-----	V
POWER SUPPLY CURRENT FOR LED	$I_{LED}$	NOTE(6)	-----	NOTE(6)	NOTE(6)	mA	

NOTE(1): APPLIED TO TERMINALS DB0~DB7

(2): APPLIED TO TERMINALS  $\overline{D/I}$ ,  $\overline{R/W}$ , E, DB0~DB7, CS1, CS2,  $\overline{RST}$

(3): THE DISPLAY PATTERN IS ALL "ON", OR ALL "OFF"

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

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

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

(6): LED CURRENT FOR DIFFERENT LED BACKLIGHT TYPE

<i>LED B.L TYPE</i>	<i>CONDITION</i>	<i>I<sub>LED</sub></i>				<i>LED COLOR</i>
		<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT.</i>	
LED B.L (ARRAY)	$V_{LED} = 5.0\text{V}$	-----	250	375	mA	YELLOW-GREEN、 AMBER、ORANGE、RED
LED B.L (EDGE)	$V_{LED} = 4.0\text{V}$	-----	75	100	mA	BLUE、WHITE、 PURE-GREEN



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### Optical characteristics

#### STN TYPE LCD

$T_a = 25^{\circ}\text{C}$   $V_{DD}-V_O = 8.5\text{V}$

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

$T_a = 25^{\circ}\text{C}$   $V_{DD}-V_O = 8.5\text{V}$

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)
		6.0	----	----		BLUE、WHITE、 PURE-GREEN	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.

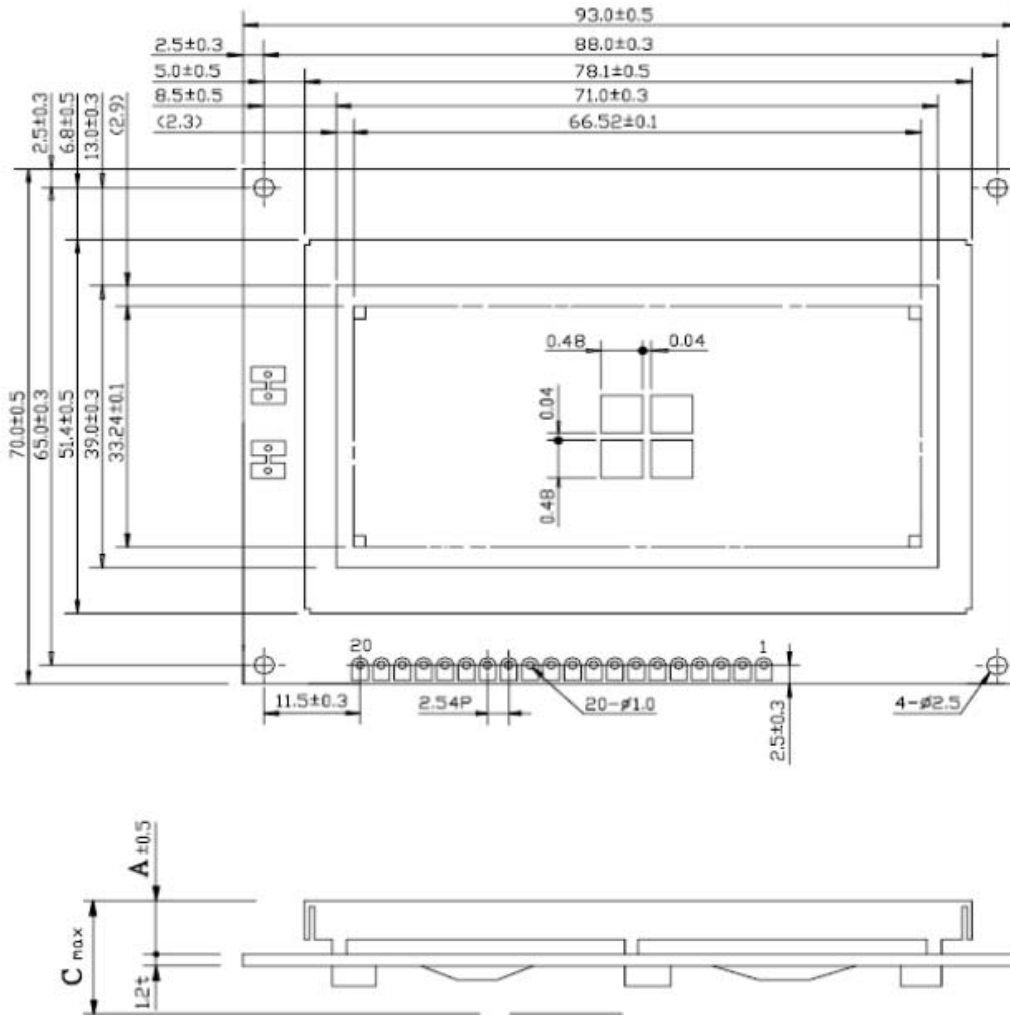






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*2.ARRAY LED and NO BLACKLIGHT Outline dimension*



TYPE	A	C
LED B.L	9.0	15.0
NO B.L	5.0	10.0

NOTE :  
 1.UNIT : mm  
 2.SCALE : NTS



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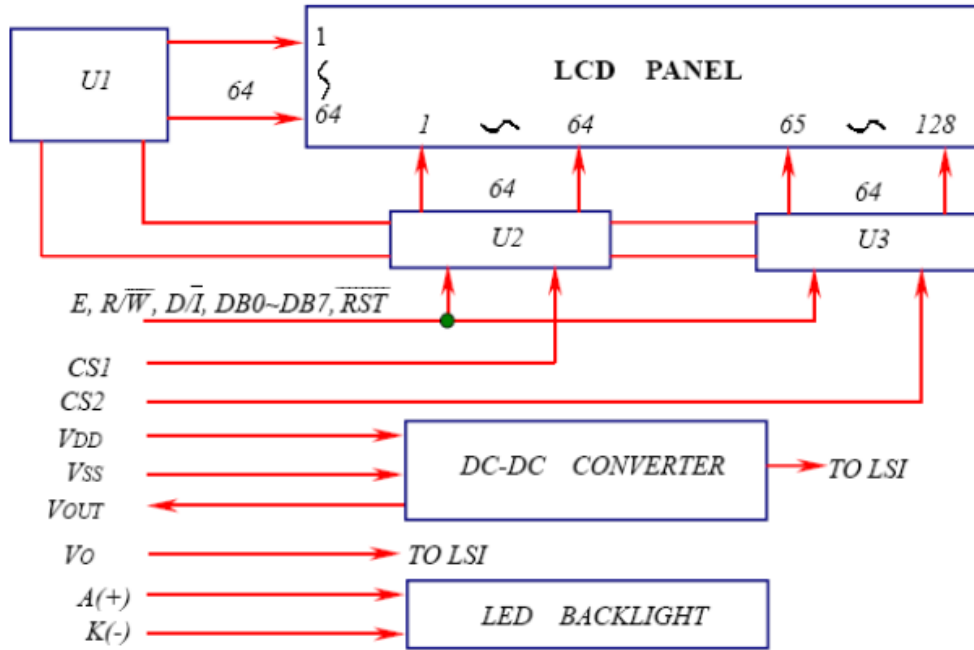
### *Interface pin connection*

PIN NO.	SYMBOL	FUNCTION
1	VSS	GROUND
2	VDD	POWER SUPPLY FOR LOGIC
3	Vo	OPERATING VOLTAGE FOR LCD DRIVING
4	D/ $\bar{T}$	H: DATA INPUT L: INSTRUCTION CODE INPUT
5	R/ $\bar{W}$	H: DATA READ (LCD MODULE → MPU) L: DATA WRITE (LCD MODULE ← MPU)
6	E	ENABLE SIGNAL
7	DB0	DATA INPUT/OUTPUT (LSB)
8	DB1	DATA INPUT/OUTPUT
9	DB2	DATA INPUT/OUTPUT
10	DB3	DATA INPUT/OUTPUT
11	DB4	DATA INPUT/OUTPUT
12	DB5	DATA INPUT/OUTPUT
13	DB6	DATA INPUT/OUTPUT
14	DB7	DATA INPUT/OUTPUT (MSB)
15	CS1	H: CHIP SELECTION FOR IC1
16	CS2	H: CHIP SELECTION FOR IC2
17	$\bar{RST}$	L: RESET
18	VOUT	POWER SUPPLY FOR LCD DRIVING
19	A(+)	POWER SUPPLY FOR LED (+)
20	K(-)	POWER SUPPLY FOR LED (-)

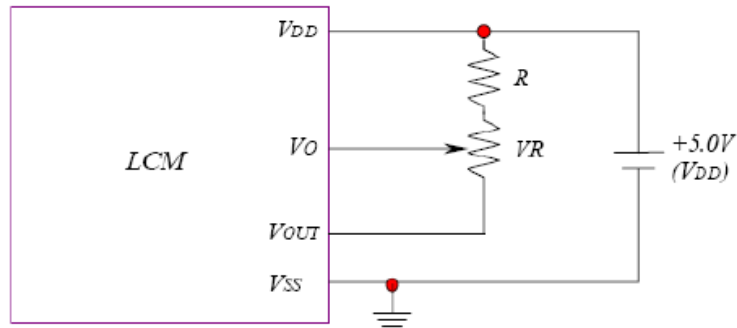


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*Block diagram*



*Power supply for LCM*

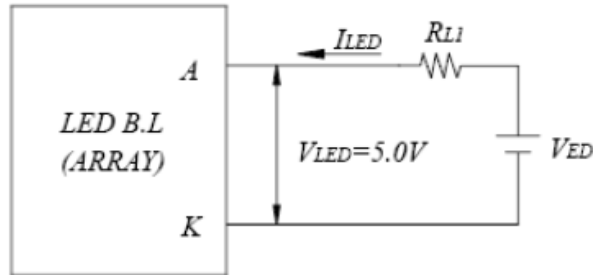


RECOMMENDED RESISTOR R:  $V_{DD} - V_O \geq 1.5V$   
 $V_{DD} - V_O$ : LCD DRIVING VOLTAGE  
 VR:  $10K\Omega \sim 20K\Omega$

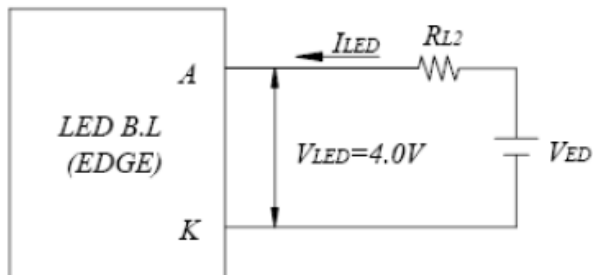


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*Power supply for LED Backlight*



$$RL1 \geq (V_{ED} - V_{LED}) / I_{LED} \text{ , } I_{LED} \leq 375.0 \text{ mA (max)}$$



$$RL2 \geq (V_{ED} - V_{LED}) / I_{LED} \text{ , } I_{LED} \leq 100.0 \text{ mA (max)}$$

*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.*