



ALL SHORE INDUSTRIES, INC.

SPECIFICATION FOR LIQUID CRYSTAL DISPLAY MODULE

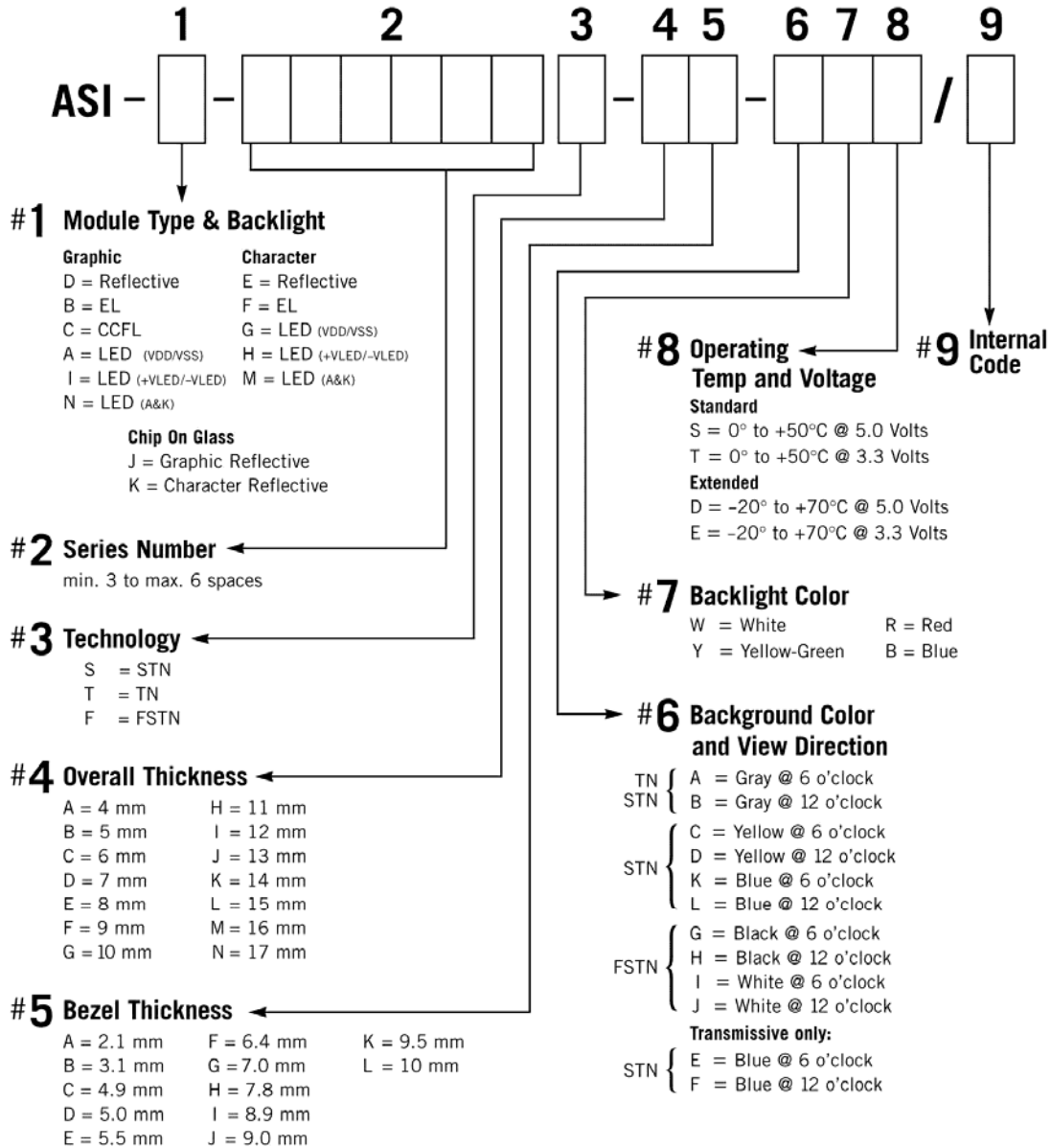
MODULE #: ASI-_-162FS-GF-_YS/W

- (1) NUMBER OF DOT-----16 CH * 2 LINE
- (2) MODULE SIZE -----84.0 W * 44.0 H * 10.0T(max) mm
- (3) EFFECTIVE AREA -----64.5 W * 16.0 H mm
- (4) CHARACTER PATTERN -----5 * 7 DOTS + CURSOR
- (5) CHARACTER SIZE-----2.96W * 4.86 H mm
- (6) CHARACTER PITCH -----3.55 mm
- (7) DOT SIZE-----0.56 W * 0.66 H mm
- (8) DOT PITCH -----0.60 W * 0.70H mm



MODEL NO : ASI_-162FS-GF-_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-_-162FS-GF-_YS/W

1. GENERAL SPECIFICATIONS

1.1 GENERAL SPECIFICATIONS

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

AS - 002A

1.2 APPLICATION NOTES FOR CONTROLLER / DRIVER :

PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

1.3 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS .

2. MECHANICAL SPECIFICATIONS

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3. ABSOLUTE MAXIMUM RATINGS

5.1 Electrical absolute maximum ratings

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	$V_{DD}-V_{SS}$	0	6.0	V	-----
INPUT VOLTAGE	V_i	V_{SS}	V_{DD}	V	-----
STATIC ELECTRICITY	-----	-----	100	V	NOTE (1)
POWER SUPPLY FOR LED	V_{LED}	-----	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):

SYMBOL	V_{LED} MAX.	LED TYPE
V_{LED}	6.0V	YELLOW-GREEN,AMBER,ORANGE,RED
	5.0V	BLUE,GREEN,WHITE

5.2 Environmental absolute maximum ratings

ITEM	OPERATING			STORAGE		COMMENT
	CONDITION	MIN.	MAX.	MIN.	MAX.	
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): $T_a \leq 50^\circ\text{C}$: 90% RH MAX.

$T_a > 50^\circ\text{C}$: 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^2

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4. ELECTRICAL CHARACTERISTICS

Electrical characteristics

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

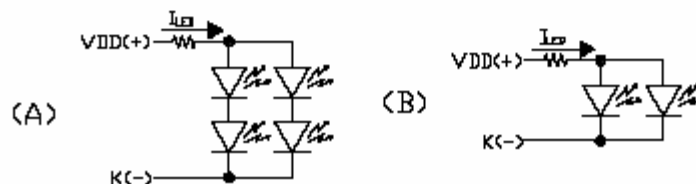
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
INPUT VOLTAGE	V_{IH}	-----	2.2	-----	-----	V	
	V_{IL}	-----	-----	-----	0.6	V	
OUTPUT VOLTAGE	V_{OH}	$-I_{OH} = 0.205\text{ mA}$	2.4	-----	-----	V	
	V_{OL}	$I_{OL} = 1.2\text{ mA}$	-----	-----	0.4	V	
POWER SUPPLY CURRENT	I_{DD}	$V_{DD} = 5.0\text{V}$	-----	1.0	1.5	mA	
RECOMMENDED LCD DRIVING VOLTAGE, NOTE(1)	$V_{DD}-V_O$	STN/ FSTN 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
		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}	V_{LED}	-----	NOTE(3)	NOTE(3)	mA	

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

(2): $\theta = 0^\circ$: VIEWING ANGLE AT 6 O'CLOCK
 $\theta = 180^\circ$: VIEWING ANGLE AT 12 O'CLOCK

▲ (3): LED CURRENT OF DEFFERENT LED TYPE

TYPE	I_{LED} TYP. / MAX.	LED TYPE
A	30mA / 40mA	YELLOW-GREEN、AMBER、ORANGE、RED
B	30mA / 40mA	BLUE、GREEN、WHITE



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Optical characteristics

TN TYPE LCD

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

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

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

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)	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 TYPE LCD

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

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 LED backlight

SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	LED TYPE	NOTE
B	$\Phi = 0^{\circ}$	4.0	----	----	cd/m ²	YELLOW-GREEN、RED、 AMBER、ORANGE	NOTE(2)
	$\theta = 0^{\circ}$	6.0	----	----			BLUE、GREEN、WHITE

NOTE (1): $\theta = 0^{\circ}$ WHEN VIEWING ANGLE AT 6 O'CLOCK
 $\theta = 180^{\circ}$ WHEN VIEWING ANGLE AT 12 O'CLOCK

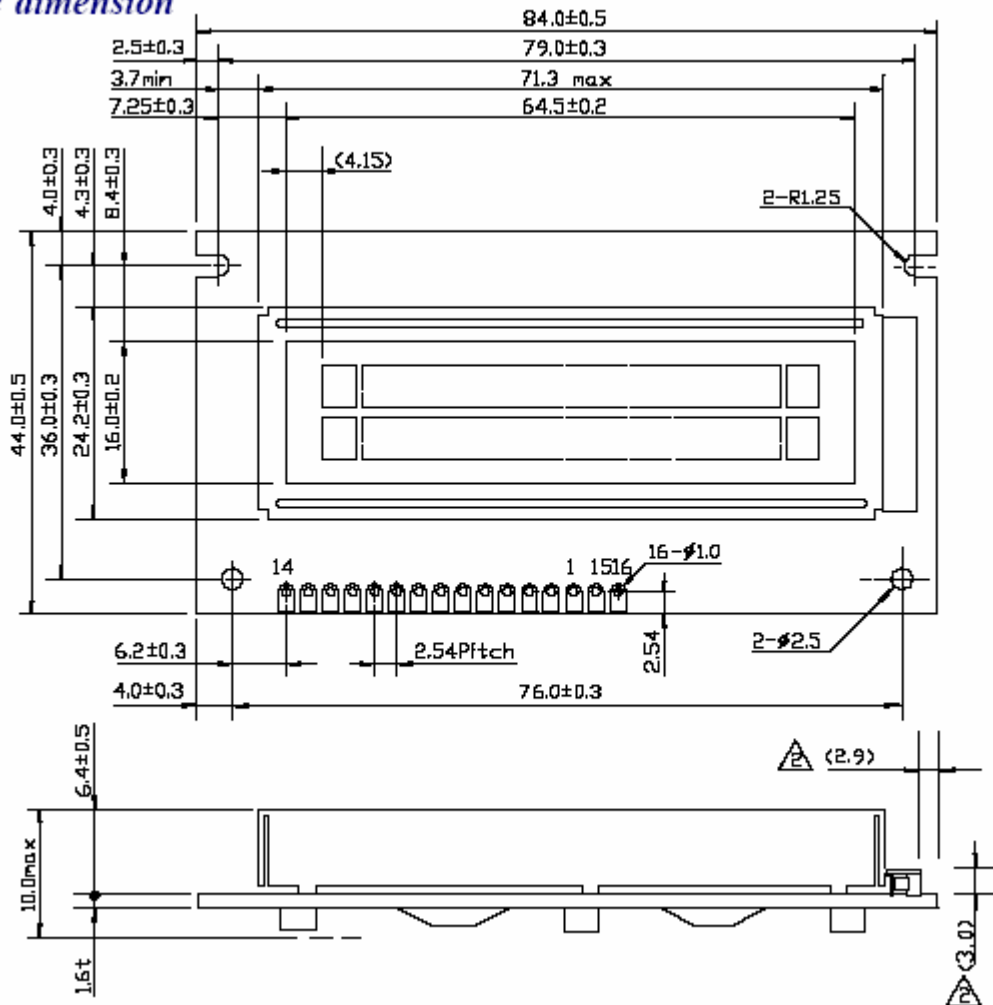
(2): SEE CUSTOMER ACCEPTANCE STANDARD SPECIFICATION FOR
DEFINITION OF OPTICAL CHARACTERISTICS.

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

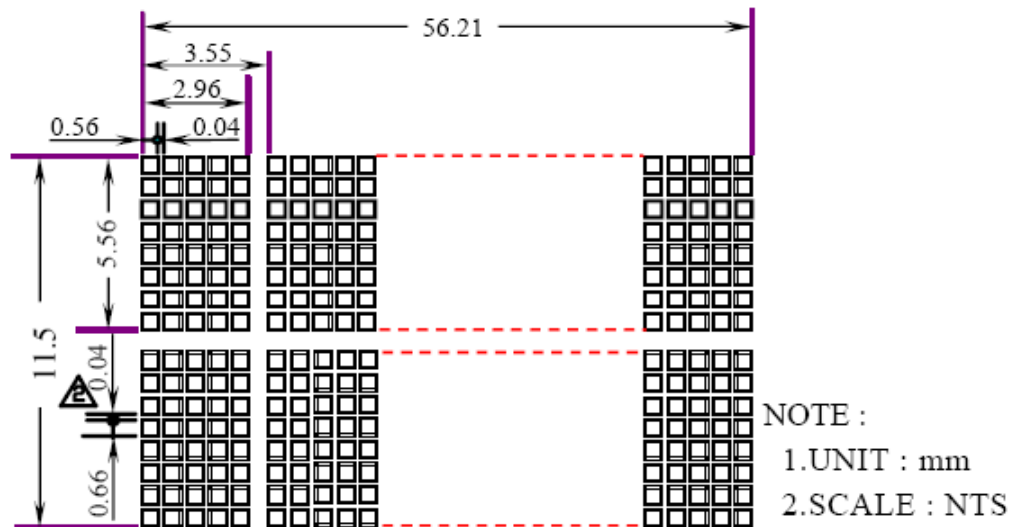
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6. OUTLINE DIMENSION

Outline dimension



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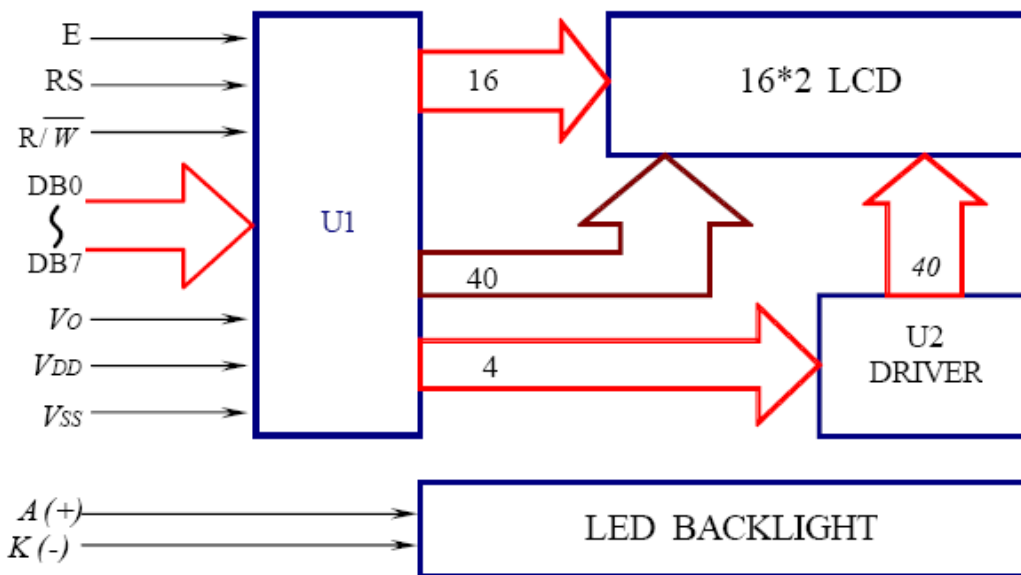
Interface pin connection

PIN NO.	1	2	3	4	5	6	7	8
SYMBOL	V _{SS}	V _{DD}	V _O	RS	R/W	E	DB0	DB1
PIN NO.	9	10	11	12	13	14	15	16
SYMBOL	DB2	DB3	DB4	DB5	DB6	DB7	A(+)	K(-)



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Block diagram

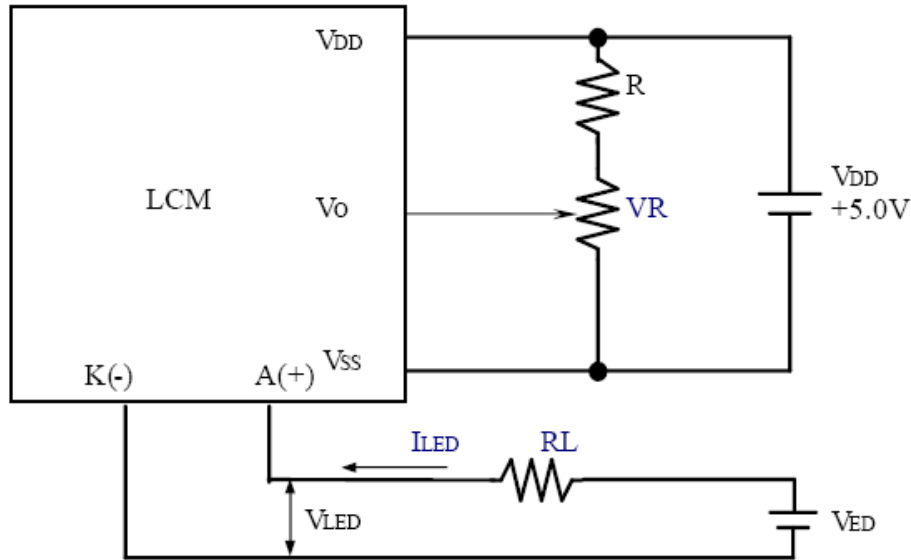


Display data address charts

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

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Power supply for LCM



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

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

VR: 10K ~20K

<i>ITEM</i>	<i>LED TYPE</i>	<i>CONDITION</i>
Limit resister of LED (RL)	A	$RL \sim ((V_{ED}-5.0V) / I_{LED})$ $I_{LED} \sim 40mA$
	Δ B	$RL \sim ((V_{ED}-4.0V) / I_{LED})$ $I_{LED} \sim 40mA$

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.