



ALL SHORE INDUSTRIES, INC.

SPECIFICATION FOR LIQUID CRYSTAL DISPLAY MODULE

MODULE #: ASI-D-2406A_-GD-_S/W

(1)	NUMBER OF DOTS	-----	240W X 64.0H DOTS
(2)	MODULE SIZE	-----	180.0W X 65.0H X 15.0D (max)mm
(3)	EFFECTIVE AREA	-----	134W X 40.0H mm
(4)	ACTIVE AREA	-----	127.16W X 33.88H mm
(5)	DOT SIZE	-----	0.49W X 0.49H mm
(6)	DOT PITCH	-----	0.53W X 0.53H mm
(7)	DRIVING METHOD	-----	1 /64 DUTY MULTIPLEX DRIVE
(8)	VIEWING DIRECTION	-----	6 or 12 O ' CLOCK
(9)	LCD TYPE	-----	FSTN, STN YELLOW, GRAY
(10)	CONTROLLER	-----	T6963C



MODEL NO : ASI-D-2406AS-GD-_S/W

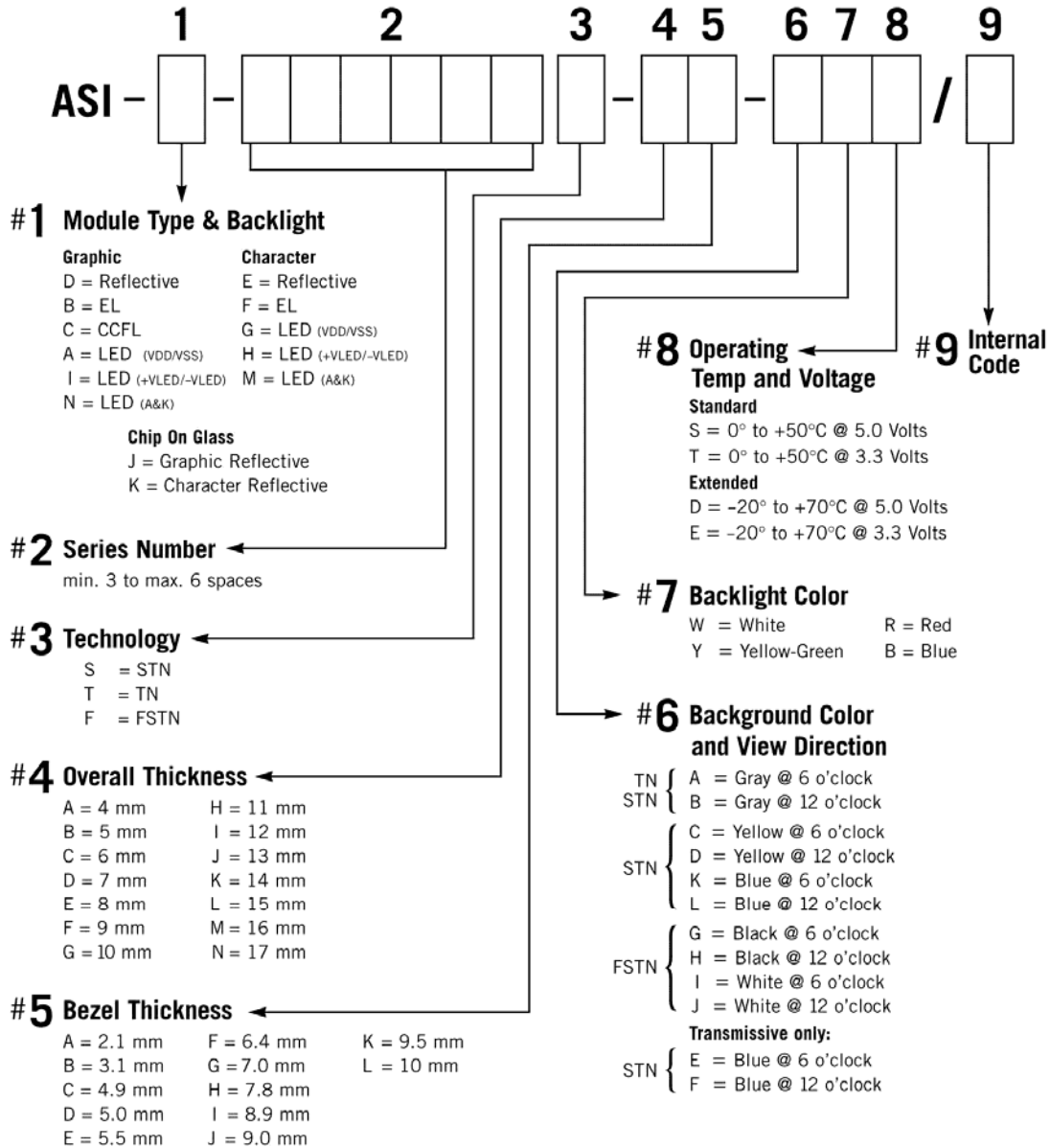
RECORD OF REVISION

DATE	PAGE	SUMMARY
2003/8/12	P8	ADD THE 21 TH & 22 TH MOUNTING HOLES OF I/O
	P9	ADD THE 21 TH & 22 TH PIN DEFINITION OF INTERFACE
2003/9/18	P4	MODIFY THE MECHANICAL DATA: (3)EFFECTIVE AREA: 132.6W*39.0H→134.0W*40.0H



MODEL NO : ASI-D-2406AS-GD-_S/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-D-2406AS-GD-_S/W

General specifications

General specifications

PLEASE REFER TO:

"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-6963C)".


This individual specification is prior to general specifications

Mechanical data

(1) NUMBER OF DOT----- 240 W* 64 H DOTS

(2) MODULE SIZE ----- 180.0 W * 65.0 H * C T (Max) mm

(The value of "C" refer to Outline Dimension P8/11)

(3) EFFECTIVE AREA ----- 134.0 W * 40.0 H mm 

(4) ACTIVE AREA ----- 127.16 W * 33.88 H mm

(5) DOT SIZE----- 0.49 W * 0.49 H mm

(6) DOT PITCH ----- 0.53 W * 0.53 H mm



MODEL NO : ASI-D-2406AS-GD-_S/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 _{DD-Vss}	0	6.0	V	-----
INPUT VOLTAGE	V _I	V _{SS}	V _{DD}	V	-----
STATIC ELECTRICITY	-----	-----	100	V	NOTE (1)
POWER SUPPLY FOR EL BACKLIGHT	V _{EL}	-----	AC200	V _{rms}	f _{EL} =1.0KHz 60 SEC.MAX
	f _{EL}	-----	2.0	KHz	AC115 V _{rms} 60 SEC.MAX
POWER SUPPLY FOR LED	V _{LED}	-----	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>OPERATING</i>		<i>STORAGE</i>		<i>COMMENT</i>
	<i>MIN.</i>	<i>MAX.</i>	<i>MIN.</i>	<i>MAX.</i>	
AMBIENT TEMPERATURE	-20°C	70°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): T_a ≤ 50°C: 90% RH MAX.

T_a > 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/s²



MODEL NO : ASI-D-2406AS-GD-_S/W

Electrical characteristics

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

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	
POWER SUPPLY VOLTAGE FOR CIRCUIT	$V_{DD}-V_{SS}$	-----	4.75	5.0	5.25	V	
INPUT VOLTAGE NOTE (1)	V_{IH}	H LEVEL	2.0	-----	V_{DD}	V	
	V_{IL}	L LEVEL	0	-----	0.8	V	
OUTPUT VOLTAGE NOTE (2)	V_{OH}	$I_{OH} = -0.3 \text{ mA}$	2.4	-----	-----	V	
	V_{OL}	$I_{OH} = 3.0 \text{ mA}$	-----	-----	0.4	V	
POWER SUPPLY CURRENT, NOTE (3)	I_{DD}	$V_{DD}-V_{SS} = 5.0 \text{ V}$	-----	20.0	30.0	mA	
RECOMMENDED LCD DRIVING VOLTAGE, NOTE(4)	$V_{DD}-V_O$	STN/ FSTN DUTY =1/64 $\Phi=10^{\circ}$ NOTE(5)	$T_a=-20^{\circ}\text{C}$	-----	13.1	-----	V
			$T_a= 0^{\circ}\text{C}$	-----	12.9	-----	V
			$T_a= 25^{\circ}\text{C}$	-----	12.7	-----	V
			$T_a= 50^{\circ}\text{C}$	-----	12.5	-----	V
			$T_a= 70^{\circ}\text{C}$	-----	12.4	-----	V
POWER SUPPLY CURRENT FOR EL BACKLIGHT	I_{EL}	$V_{EL} = 115V_{rms}$ $f_{EL} = 400\text{Hz}$	-----	8.0	-----	mA _{rms}	
POWER SUPPLY CURRENT FOR LED	I_{LED}	-----	-----	NOTE(6)	NOTE(6)	mA	

NOTE (1): APPLIED TO TERMINALS DBO ~ DB7, \overline{WR} , \overline{RD} , \overline{CS} , $\overline{C/D}$, \overline{RES} , FS

(2): APPLIED TP TERMINALS DBO ~ DB7

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

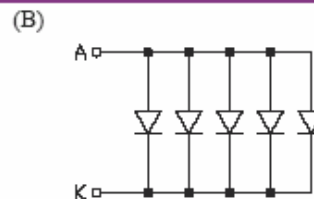
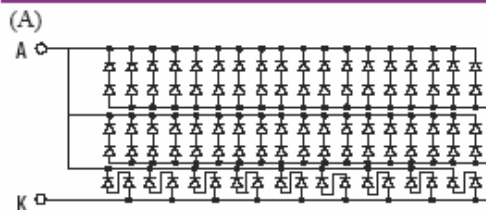
(4): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT $\pm 0.5\text{V}$ BY EACH MODULE.

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

$\theta = 180^{\circ}$: VIEWING ANGLE AT 12 O'CLOCK

(6): LED CURRENT OF DEFFERENT LED TYPE

TYPE	V_{LED}	I_{LED} TYP. / MAX.	LED TYPE
A	5.0V	450mA / 700mA	YELLOW-GREEN ,ORANGE (ARRAY LED)
B	4.0V	75mA / 100mA	WHITE (EDGE LED)





MODEL NO : ASI-D-2406AS-GD-_S/W

Optical characteristics

STN TYPE LCD

 $T_a = 25^{\circ}\text{C}$ $V_{DD}-V_O=12.7\text{V}$

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)

FSIN TYPE LCD

 $T_a = 25^{\circ}\text{C}$ $V_{DD}-V_O=12.7\text{V}$

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 backlight

SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	LED TYPE	NOTE
B	$\Phi = 0^{\circ}$ $\theta = 0^{\circ}$	4.0	----	----	cd/m ²	EL BACKLIGHT	NOTE(2)
		5.0	----	----		YELLOW-GREEN、ORANGE	NOTE(3)
		5.0	----	----		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.



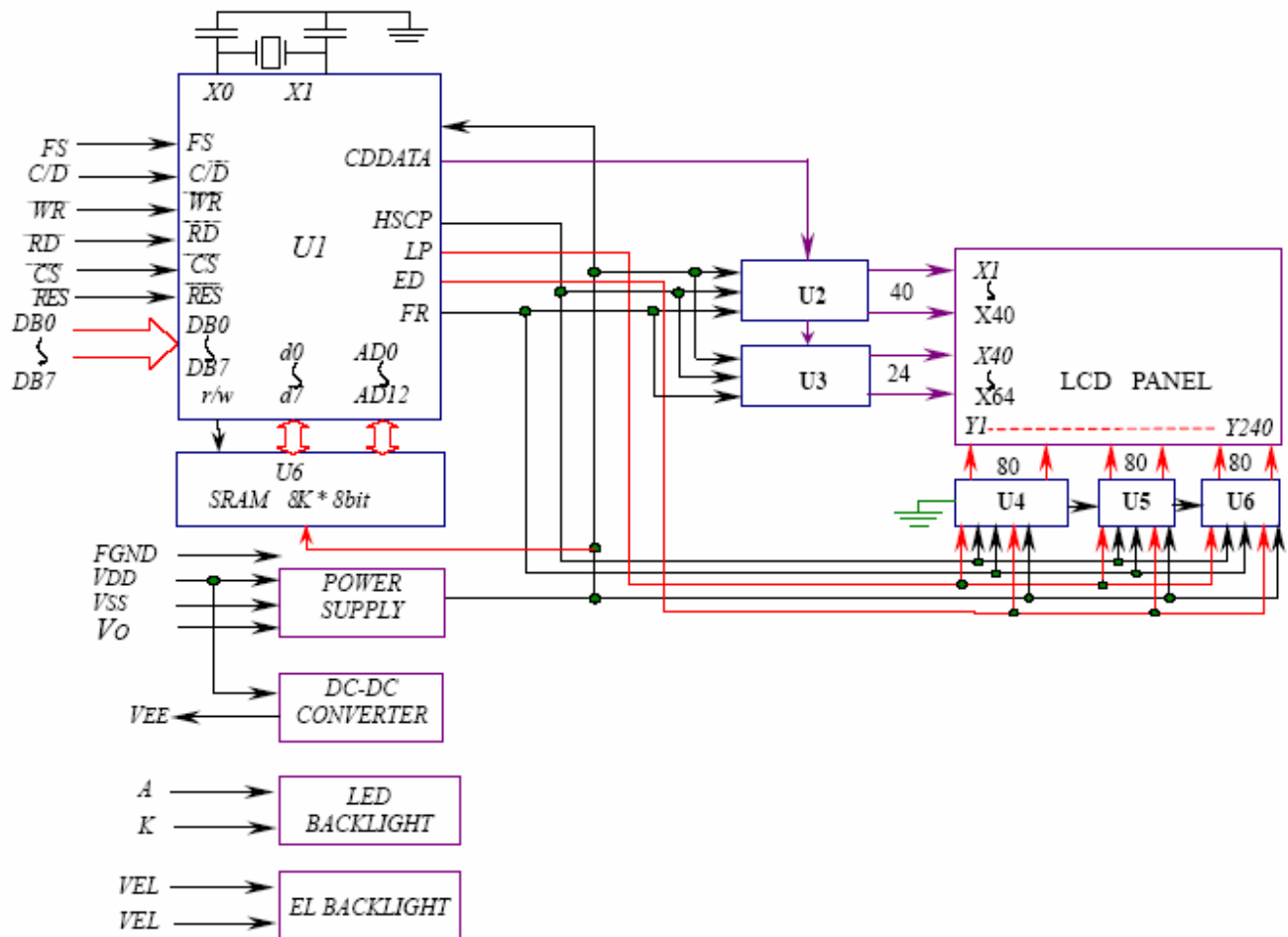
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Interface pin connection

PIN NO.	SYMBOL	FUNCTION
1	FGND	FRAME GROUND
2	V _{SS}	POWER SUPPLY (GND)
3	V _{DD}	POWER SUPPLY (+5V)
4	V _O	OPERATING VOLTAGE FOR LCD DRIVING
5	\overline{WR}	L: DATA WRITE (LCD MODULE ← MPU)
6	\overline{RD}	L: DATA READ (LCD MODULE → MPU)
7	\overline{CS}	L: CHIP ENABLE
8	C/ \overline{D}	\overline{WR} ="L",C/ \overline{D} ="H": COMMAND WRITE C/ \overline{D} ="L": DATA WRITE \overline{RD} ="L",C / \overline{D} ="H" :STATUS READ C/ \overline{D} ="L" : DATA READ
9	V _{EE}	POWER SUPPLY FOR LCD DRIVING OUTPUT
10	\overline{RES}	L: RESET
11	DB0	DATA INPUT/OUTPUT (LSB)
12	DB1	DATA INPUT/OUTPUT
13	DB2	DATA INPUT/OUTPUT
14	DB3	DATA INPUT/OUTPUT
15	DB4	DATA INPUT/OUTPUT
16	DB5	DATA INPUT/OUTPUT
17	DB6	DATA INPUT/OUTPUT
18	DB7	DATA INPUT/OUTPUT (MSB)
19	FS	TERMINALS FOR SELECTION OF COLUMNS H: 6 * 8 FONT L: 8 * 8 FONT
20	N.C	NO CONNECTION
21	N.C	NO CONNECTION
22	N.C	NO CONNECTION
-----	A	POWER SUPPLY FOR LED BACKLIGHT
-----	K	POWER SUPPLY FOR LED BACKLIGHT

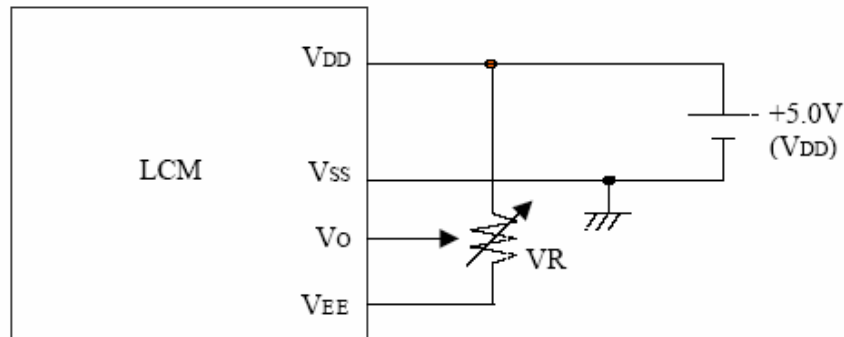
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Block diagram



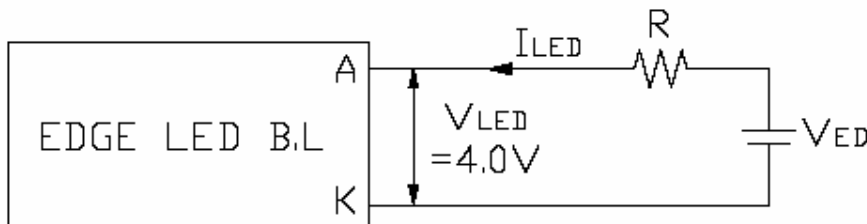
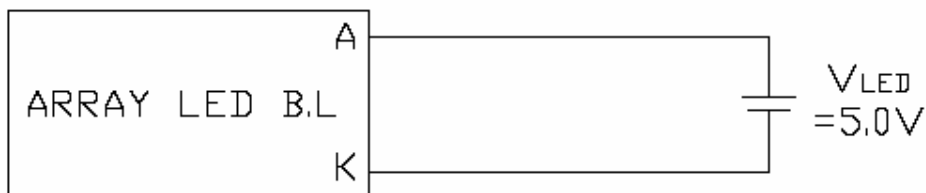
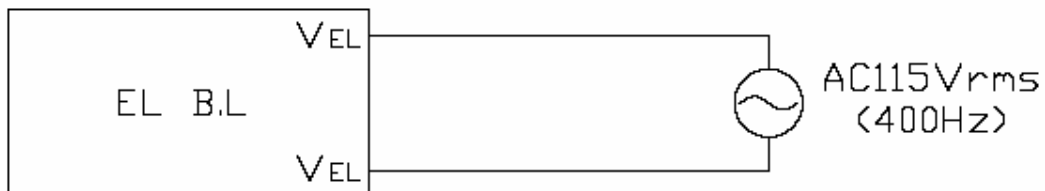
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Power supply for LCM



$V_{DD}-V_o$: LCD DRIVING VOLTAGE
 V_R : 200K Ω

Power supply for backlight



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