ALL SHORE INDUSTRIES, INC.

SPECIFICATION FOR
LIQUID CRYSTAL DISPLAY MODULE

MODULE # : ASI-D-1223BS-EC-_S/W

(1)	NUMBER OF DOTS	122 W * 32 H DOTS
(2)	MODULE SIZE	84.0 W * 44.0 H * 8.0 T (max) mm
(3)	EFFECTIVE AREA	57.2 W * 1 7.7 H mm
(4)	ACTIVE AREA	52.42 W * 13.72 H mm
(5)	DOT SIZE	0.39 W * 0.39 H mm
(6)	DOT PITCH	0.43 W * 0.43 H mm
(7)	VIEWING DIRECTION	6 O'CLOCK
(8)	LCD TYPE	STN,YELLOW-GREEN,REFLECTIVE

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

MODEL NO : ASI-D-1223BS-EC-_S/W

RECORD OF REVISION

DATE	PAGE	SUMMARY

ALL SHORE INDUSTRIES

MODEL NO : ASI-D-1223BS-EC-_S/W

LCD MODULE PART NUMBERING SYSTEM

ASI – [1] – [2] [3] – [4] [5] – [6] [7] [8] / [9]

#1 Module Type & Backlight

Graphic	Character
D = Reflective	E = Reflective
B = EL	F = EL
C = CCFL	G = LED (VDD/VSS)
A = LED (VDD/VSS)	H = LED (+VLED/–VLED)
I = LED (+VLED/–VLED)	M = LED (A&K)
N = LED (A&K)	

Chip On Glass
J = Graphic Reflective
K = Character Reflective

#2 Series Number
min. 3 to max. 6 spaces

#3 Technology
S = STN
T = TN
F = FSTN

#4 Overall Thickness

A = 4 mm	H = 11 mm
B = 5 mm	I = 12 mm
C = 6 mm	J = 13 mm
D = 7 mm	K = 14 mm
E = 8 mm	L = 15 mm
F = 9 mm	M = 16 mm
G = 10 mm	N = 17 mm

#5 Bezel Thickness

A = 2.1 mm	F = 6.4 mm	K = 9.5 mm
B = 3.1 mm	G = 7.0 mm	L = 10 mm
C = 4.9 mm	H = 7.8 mm	
D = 5.0 mm	I = 8.9 mm	
E = 5.5 mm	J = 9.0 mm	

#6 Background Color and View Direction

TN / STN
A = Gray @ 6 o'clock
B = Gray @ 12 o'clock

STN
C = Yellow @ 6 o'clock
D = Yellow @ 12 o'clock
K = Blue @ 6 o'clock
L = Blue @ 12 o'clock

FSTN
G = Black @ 6 o'clock
H = Black @ 12 o'clock
I = White @ 6 o'clock
J = White @ 12 o'clock

Transmissive only:
STN
E = Blue @ 6 o'clock
F = Blue @ 12 o'clock

#7 Backlight Color

W = White	R = Red
Y = Yellow-Green	B = Blue

#8 Operating Temp and Voltage

Standard
S = 0° to +50°C @ 5.0 Volts
T = 0° to +50°C @ 3.3 Volts

Extended
D = -20° to +70°C @ 5.0 Volts
E = -20° to +70°C @ 3.3 Volts

#9 Internal Code

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

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MODEL NO : ASI-D-1223BS-EC-_S/W

1. GENERAL SPECIFICATIONS

1 . 1 GENERAL SPECIFICATIONS
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :

AS - 10-1000

1 . 2 APPLICATION NOTES FOR CONTROLLER / DRIVER : SED1520
PLEASE REFER TO :

CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS :
AS-SED1520D0A

1 . 3 THIS INDIVIDUAL SPECIFICATIONS IS PRIOR TO GENERAL SPECIFICATIONS .

2 . MECHANICAL SPECIFICATIONS

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(8) LCD TYPE ---------- STN,YELLOW-GREEN,REFLECTIVE

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MODEL NO : ASI-D-1223BS-EC-_S/W

Absolute maximum ratings

Electrical absolute maximum ratings

(AT Ta = 25°C)

I T E M	*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)

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 T E M	*OPERATING*		*STORAGE*		*COMMENT*
	MIN.	*MAX.*	*MIN.*	*MAX.*	
AMBIENT TEMPERATURE	0℃	50℃	-20℃	70℃	--------
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℃: 90% RH MAX.

Ta > 50℃: ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 90% RH AT 50℃. (80% RH AT 60℃)

NOTE (3): 1G = 9.8 m/s^2

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MODEL NO : ASI-D-1223BS-EC-_S/W

Electrical characteristics

Ta = 25℃ V_{DD} = 5.0 ± 0.25 V

I T E M	*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	
OUTPUT VOLTAGE NOTE (2)	V_{OH}	I_{OH} = -3.0 mA		2.4	--------	--------	V
	V_{OL}	I_{OL} = 3.0 mA		--------	--------	0.4	V
POWER SUPPLY CURRENT, NOTE (3)	I_{DD}	V_{DD}-V_{SS} = 5.0V		--------	1.5	2.0	mA
LCD DISPLAY DUTY RATIO	DUTY	--------		--------	1/32	--------	--------
CLOCK OSCILLATION FREQUENCY	fosc	FOR LCD MODULE		15	18	21	KHz
RECOMMENDED LCD DRIVING VOLTAGE, NOTE (4)	V_{DD}-V_O	Φ=10° θ = 0°	Ta = 50℃	--------	4.1	--------	V
			Ta = 25℃	--------	4.5	--------	V
			Ta = 0℃	--------	4.9	--------	V

NOTE (1): APPLIED TO TERMINALS E, A0, DB0 ~ DB7

NOTE (2): APPLIED TO TERMINALS DB0 ~ DB7

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

NOTE (4): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ± 0.5V EACH MODULE.

Optical characteristics

Ta = 25℃ V_{DD} = 5.0V

I T E M	*SYMBOL*	*CONDITION*	*MIN.*	*TYP.*	*MAX.*	*UNIT*	*NOTE*
VIEWING ANGLE	Φ2-Φ1	K = 2.0	30	40	--------	deg.	1
CONTRAST RATIO	K	Φ = 10° θ = 0°	3	4	--------	--------	1
RESPONSE TIME	tr (rise)	Φ = 10° θ = 0°	--------	200	350	ms	1
	tf (fall)	Φ = 10° θ = 0°	--------	300	400	ms	1

NOTE (1): SEE CUSTOMER ACCEPTANCE STANDARD SPECIFICATION FOR DEFINITION OF OPTICAL CHARACTERISTICS.

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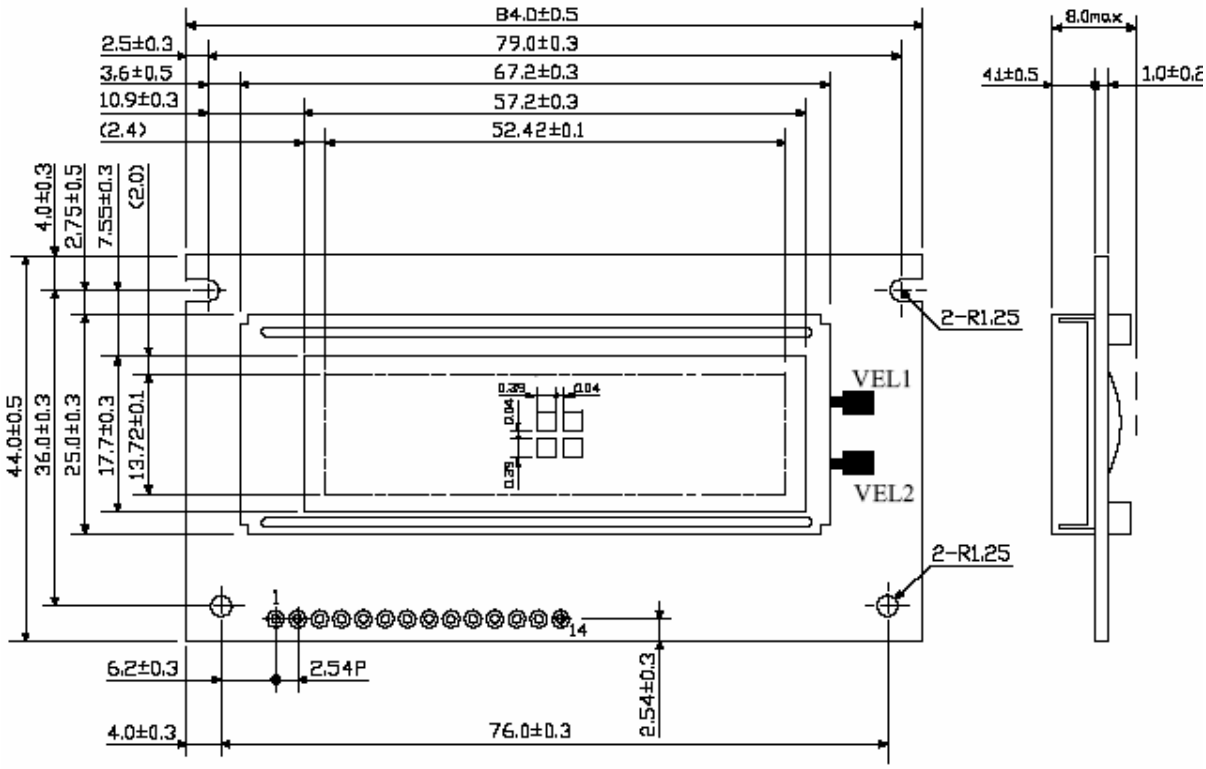
MODEL NO : ASI-D-1223BS-EC-_S/W

Dimension outline



Interface pin connection

PIN NO.	1	2	3	4	5	6	7
SYMBOL	Vss	VDD	Vo	A0	E1	E2	DB0
PIN NO.	8	9	10	11	12	13	14
SYMBOL	DB1	DB2	DB3	DB4	DB5	DB6	DB7

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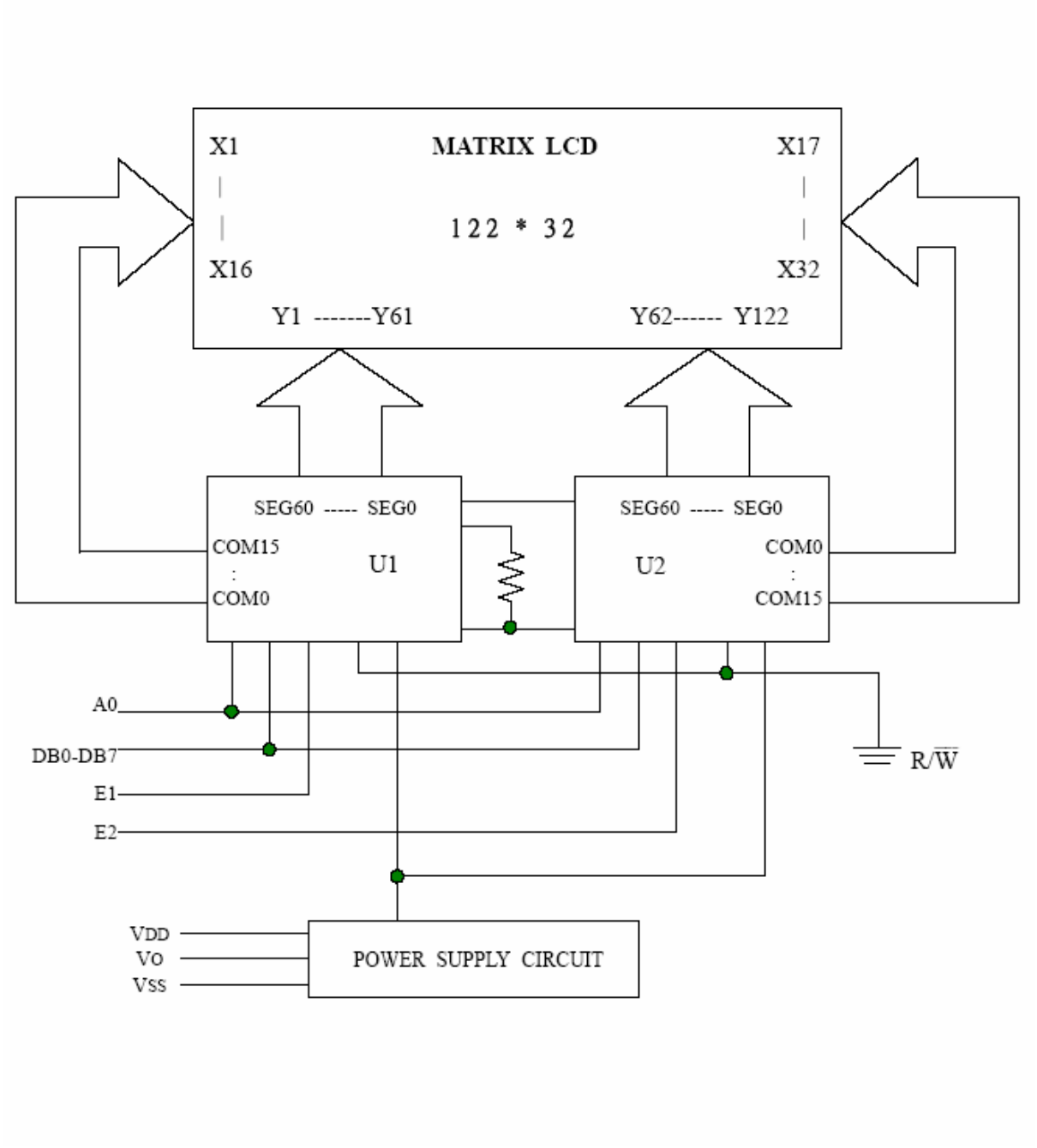
Block diagram



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Display data RAM

Page Address D1,D2=	*DATA*	*Display Pattern*	*Line Address*
0, 0	*D0*		00H
	D1		01
	D2		02
	D3	*0 Page*	03
	D4		04
	D5		05
	D6		06
	D7		07
0, 1	*D0*		08
	D1		09
	D2		*0A*
	D3	*1 Page*	*0B*
	D4		*0C*
	D5		*0D*
	D6		*0E*
	D7		*0F*
1, 0	*D0*		10
	D1		11
	D2		12
	D3	*2 Page*	13
	D4		14
	D5		15
	D6		16
	D7		17
1, 1	*D0*		18
	D1		19
	D2		*1A*
	D3	*3 Page*	*1B*
	D4		*1C*
	D5		*1D*
	D6		*1E*
	D7		*1F*

Column Address	*ADC*											
		DO=0	3C	3B	3A	39	38	37	36	35	←	00
		DO=1	13	14	15	16	17	18	19	1A	→	4F
Segment Term.			60	59	58	57	56	55	54	53		0

normal

Fig.1. Correspondence with Display Data RAM and address

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Initialization by instructions

	A0	D7	D6	D5	D4	D3	D2	D1	D0	
Power On										
RESET	1	1	1	1	1	1	1	1	1	FF
RESET	1	1	1	1	1	1	1	1	1	FF
RESET	1	1	1	1	1	1	1	1	1	FF
RESET	0	1	1	1	0	0	0	1	0	E2
Duty Ratio Select	0	1	0	1	0	1	0	0	1	A9
Static Drive Off	0	1	0	1	0	0	1	0	0	A4
ADC Select	0	1	0	1	0	0	0	0	1	A1
Display On	0	1	0	1	0	1	1	1	1	AF
Page Address Set	0	1	0	1	1	1	0	0	0	B8
Column address Set	0	0	0	0	1	0	0	1	1	13
Display start Line	0	1	1	0	0	0	0	0	0	C0
Read modify Write	0	1	1	1	0	0	0	0	0	E0
Display Data Write	1	Display Data								
Display Data Write	1	Display Data								
END	0	1	1	1	0	1	1	1	0	EE

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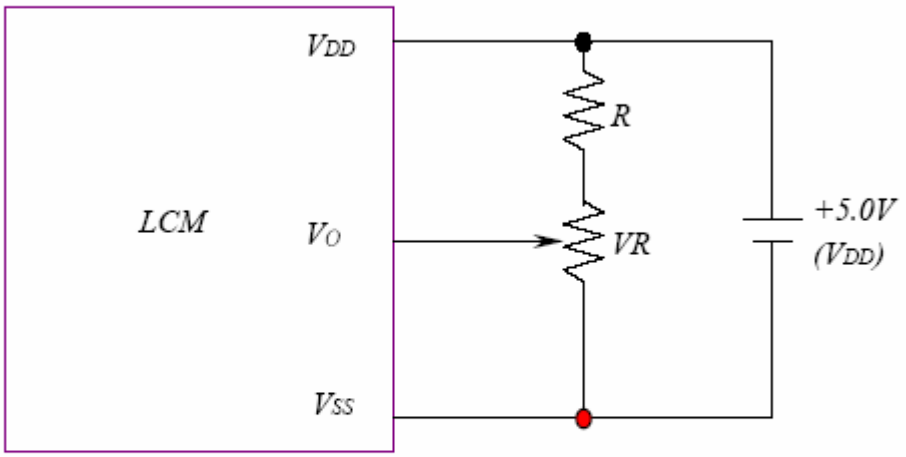
Power supply for LCM



RECOMMENDED RESISTOR R: VDD-Vo≧1.5V
VDD–Vo: LCD DRIVING VOLTAGE
VR: 10KΩ~20KΩ