



# ALL SHORE INDUSTRIES, INC.

## SPECIFICATION FOR LIQUID CRYSTAL DISPLAY MODULE

**MODULE # : ASI-B-1223BS-EC-\_WS/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 \* 17.7 H mm
- (4) ACTIVE AREA-----52.42 W \* 13.72 H mm
- (5) DOT SIZE -----0.39 W \* 0.39 Hmm
- (6) DOT PITCH-----0.43 W \* 0.43 H mm
- (7) VIEWING DIRECTION -----6 or 12 O'CLOCK
- (8) LCD TYPE -----STN YELLOW, BLUE, GRAY, FSTN
- (9) EL COLOR-----WHITE



**MODEL NO : ASI-B-1223BS-EC-\_WS/W**

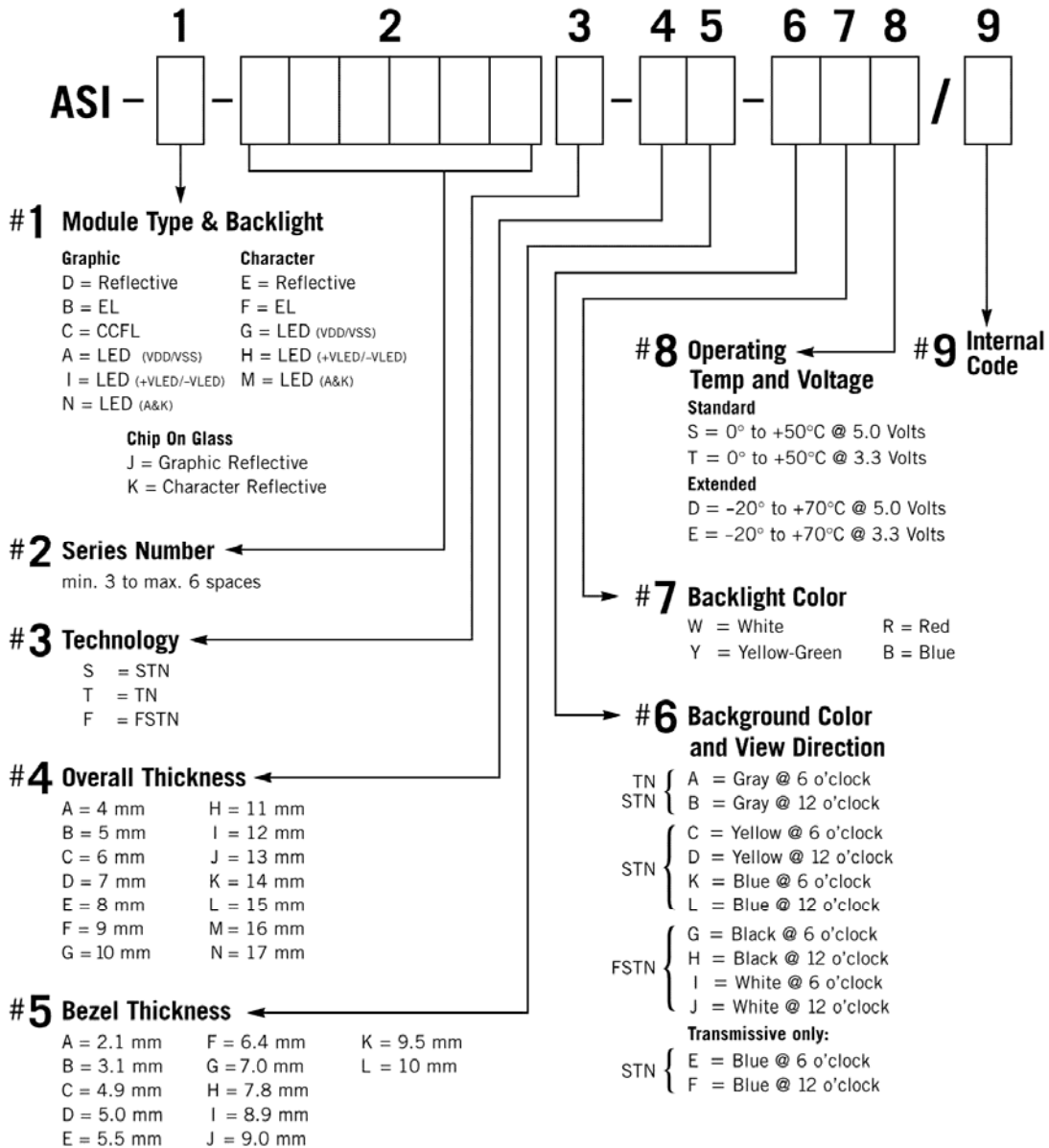
**RECORD OF REVISION**

| DATE | PAGE | SUMMARY |
|------|------|---------|
|      |      |         |



MODEL NO : ASI-B-1223BS-EC-\_WS/W

## LCD MODULE PART NUMBERING SYSTEM



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

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



**MODEL NO : ASI-B-1223BS-EC-\_WS/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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## MODEL NO : ASI-B-1223BS-EC-\_WS/W

### *Absolute maximum ratings*

#### *Electrical absolute maximum ratings*

(AT Ta = 25°C)

| <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 EL    | V <sub>EL</sub>                  | -----           | AC200           | V <sub>rms</sub> | f <sub>EL</sub> =1.0KHz<br>60 SEC.MAX |
|                        | f <sub>EL</sub>                  | -----           | 2.0             | KHz              | AC115V <sub>rms</sub><br>60 SEC.MAX   |

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   | 0°C              | 50°C        | -20°C          | 70°C        | -----  |
| HUMIDITY              | NOTE (2)         |             | NOTE (2)       |             | NO CONDENSATION                              |
| VIBRATION<br>NOTE (3) | -----            | 0.5G        | -----          | 2G          | 10 ~ 300Hz<br>XYZ<br>DIRECTIONS<br>1 Hr EACH |
| SHOCK<br>NOTE (3)     | -----            | 3G          | -----          | 50G         | 10 msec<br>XYZ<br>DIRECTIONS<br>1 TIME EACH  |
| CORROSIVE GAS         | NOT ACCEPTABLE   |             | NOT ACCEPTABLE |             | -----  |

NOTE (2): Ta ≤ 50°C: 85% RH MAX.

Ta > 50°C: ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 85% RH AT 50°C. (50% RH AT 60°C)

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



## MODEL NO : ASI-B-1223BS-EC-\_WS/W

### Electrical characteristics

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

| 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<br>NOTE (1)                 | $V_{IH}$        | H LEVEL                                       | 2.0                      | ----- | $V_{DD}$ | V     |   |
|   | $V_{IL}$        | L LEVEL                                       | 0                        | ----- | 0.8      |       |   |
| POWER SUPPLY CURRENT, NOTE (2)            | $I_{DD}$        | $V_{DD}-V_{SS}=5.0\text{V}$                   | -----                    | 1.0   | 1.5      | mA    |   |
| LCD DISPLAY DUTY RATIO                    | DUTY            | -----   | -----                    | 1/32  | -----    | ----- |   |
| CLOCK OSCILLATION FREQUENCY               | $f_{osc}$       | FOR LCD MODULE                                | 15                       | 18    | 21       | KHz   |   |
| RECOMMENDED LCD DRIVING VOLTAGE, NOTE (3) | $V_{DD}-V_O$    | $\Phi=10^\circ$<br>$\theta=0^\circ$           | $T_a = 50^\circ\text{C}$ | ----- | 4.1      | ----- | V |
|   |                 |   | $T_a = 25^\circ\text{C}$ | ----- | 4.5      | ----- | V |
|   |                 |   | $T_a = 0^\circ\text{C}$  | ----- | 4.9      | ----- | V |
| POWER SUPPLY CURRENT FOR EL               | $I_{EL}$        | $V_{EL}=115\text{V}$<br>$F_{el}=400\text{Hz}$ | -----                    | 1.5   | -----    | mA    |   |

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

NOTE (2): THE DISPLAY PATTERN IS ALL "ON", OR ALL "OFF"

NOTE (3): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT=0.5V EACH MODULE.

### Optical characteristics

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

| ITEM                        | SYMBOL          | CONDITION                                     | MIN.  | TYP.  | MAX.  | UNIT              | NOTE  |
|-----------------------------|-----------------|---|-------|-------|-------|-------------------|-------|
| VIEWING ANGLE               | $\Phi 2-\Phi 1$ | $K = 2.0$                                     | 30    | 40    | ----- | deg.              | 1     |
| CONTRAST RATIO              | K               | $\Phi = 10^\circ$<br>$\theta = 0^\circ$       | 3     | 4     | ----- | -----             | 1     |
| RESPONSE TIME               | tr (rise)       | $\Phi = 10^\circ$<br>$\theta = 0^\circ$       | ----- | 200   | 350   | ms                | 1     |
|                             | tf (fall)       | $\Phi = 10^\circ$<br>$\theta = 0^\circ$       | ----- | 300   | 400   | ms                | 1     |
| BRIGHTNESS FOR EL BACKLIGHT | B               | (*)<br>$\Phi = 0^\circ$<br>$\theta = 0^\circ$ | 4.0   | ----- | ----- | cd/m <sup>2</sup> | ----- |

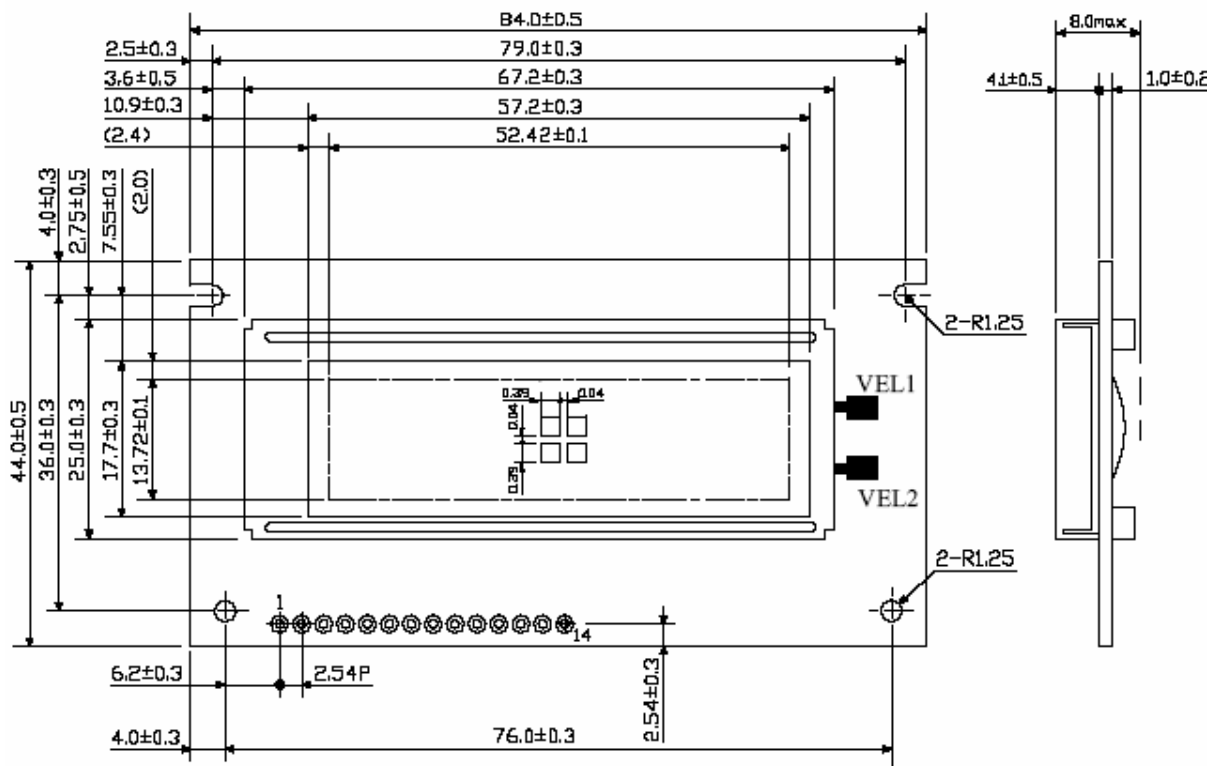
(\*UNDER NORMAL TEMPERATURE AND HUMIDITY IN A DARK ROOM)

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



**MODEL NO : ASI-B-1223BS-EC-\_WS/W**

*Dimension outline*



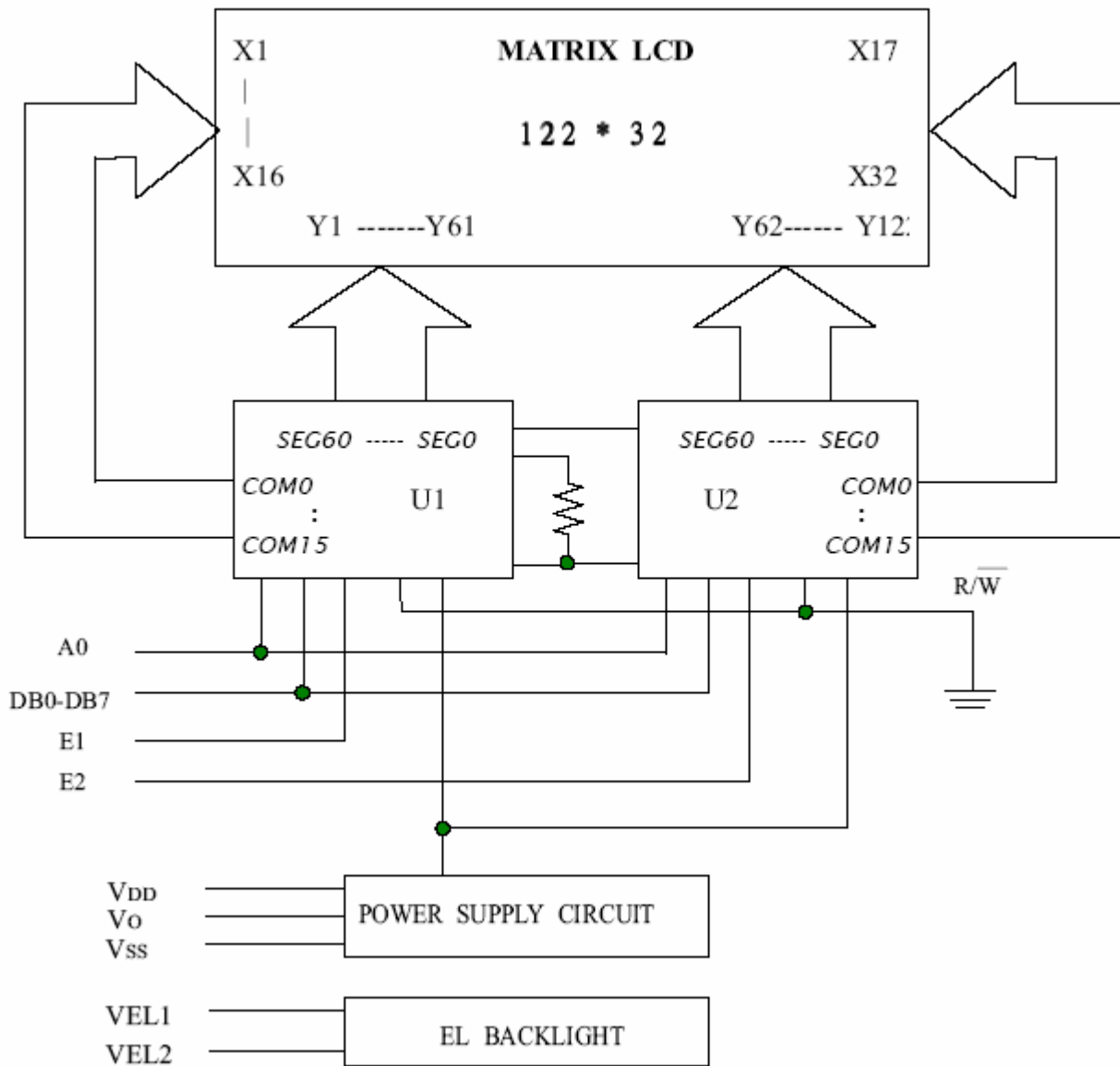
*Interface pin connection*

|                |                 |                 |                |     |     |     |     |
|----------------|-----------------|-----------------|----------------|-----|-----|-----|-----|
| <b>PIN NO.</b> | 1               | 2               | 3              | 4   | 5   | 6   | 7   |
| <b>SYMBOL</b>  | V <sub>SS</sub> | V <sub>DD</sub> | V <sub>O</sub> | A0  | E1  | E2  | DB0 |
| <b>PIN NO.</b> | 8               | 9               | 10             | 11  | 12  | 13  | 14  |
| <b>SYMBOL</b>  | DB1             | DB2             | DB3            | DB4 | DB5 | DB6 | DB7 |



MODEL NO : ASI-B-1223BS-EC-\_WS/W

Block diagram





MODEL NO : ASI-B-1223BS-EC-\_WS/W

Display data RAM

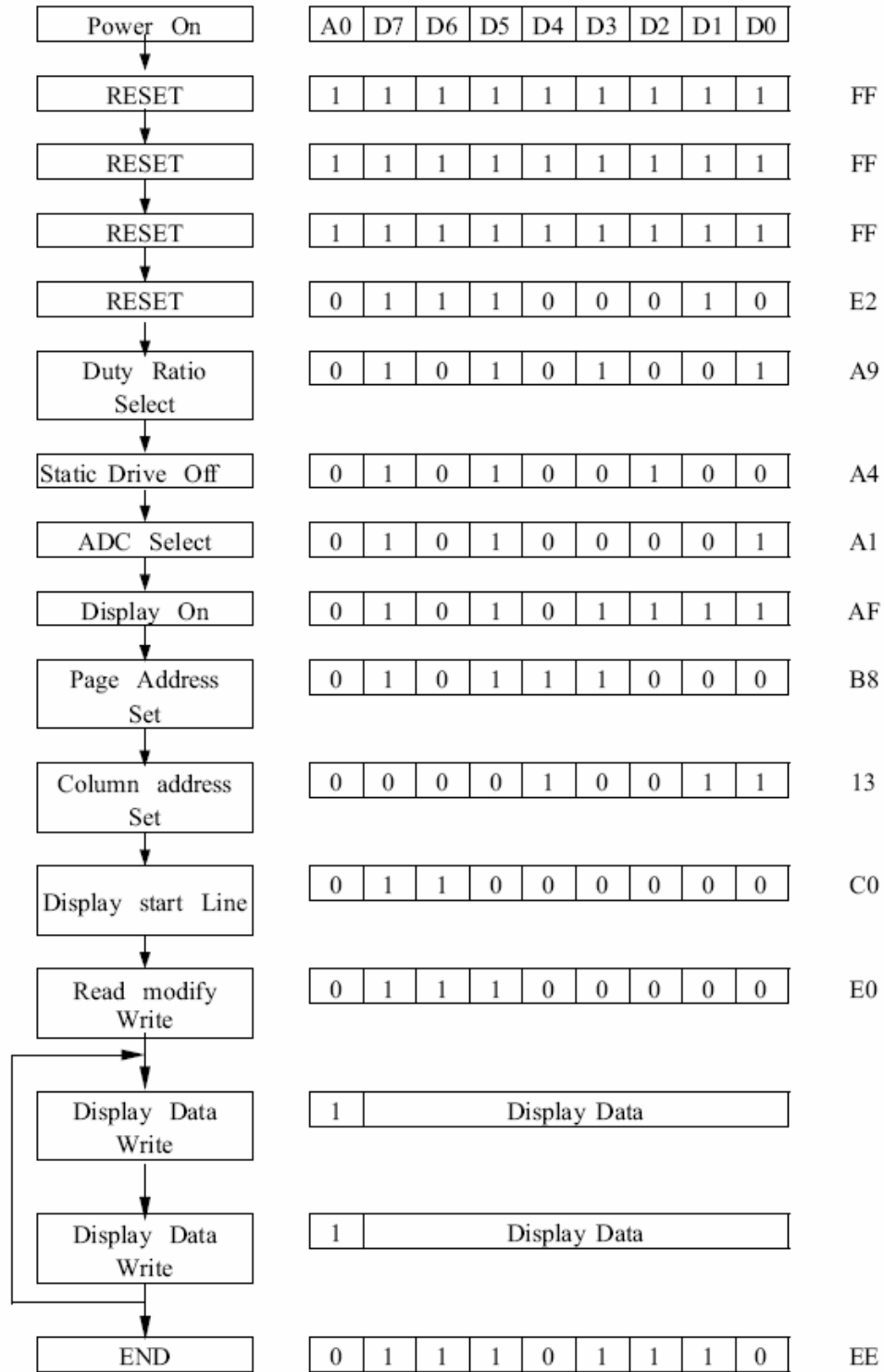
| Page Address<br>D1,D2= | DATA | Display Pattern |    |    |    |    |    |    |    |       |        | Line Address |
|------------------------|------|-----------------|----|----|----|----|----|----|----|-------|--------|--------------|
| 0, 0                   | D0   | [Pattern]       |    |    |    |    |    |    |    |       |        | 00H          |
|                        | D1   | [Pattern]       |    |    |    |    |    |    |    |       |        | 01           |
|                        | D2   | [Pattern]       |    |    |    |    |    |    |    |       |        | 02           |
|                        | D3   | [Pattern]       |    |    |    |    |    |    |    |       |        | 0 Page       |
|                        | D4   | [Pattern]       |    |    |    |    |    |    |    |       |        | 04           |
|                        | D5   | [Pattern]       |    |    |    |    |    |    |    |       |        | 05           |
|                        | D6   | [Pattern]       |    |    |    |    |    |    |    |       |        | 06           |
|                        | D7   | [Pattern]       |    |    |    |    |    |    |    |       |        | 07           |
| 0, 1                   | D0   | [Pattern]       |    |    |    |    |    |    |    |       |        | 08           |
|                        | D1   | [Pattern]       |    |    |    |    |    |    |    |       |        | 09           |
|                        | D2   | [Pattern]       |    |    |    |    |    |    |    |       |        | 0A           |
|                        | D3   | [Pattern]       |    |    |    |    |    |    |    |       |        | 1 Page       |
|                        | D4   | [Pattern]       |    |    |    |    |    |    |    |       |        | 0C           |
|                        | D5   | [Pattern]       |    |    |    |    |    |    |    |       |        | 0D           |
|                        | D6   | [Pattern]       |    |    |    |    |    |    |    |       |        | 0E           |
|                        | D7   | [Pattern]       |    |    |    |    |    |    |    |       |        | 0F           |
| 1, 0                   | D0   | [Pattern]       |    |    |    |    |    |    |    |       |        | 10           |
|                        | D1   | [Pattern]       |    |    |    |    |    |    |    |       |        | 11           |
|                        | D2   | [Pattern]       |    |    |    |    |    |    |    |       |        | 12           |
|                        | D3   | [Pattern]       |    |    |    |    |    |    |    |       |        | 2 Page       |
|                        | D4   | [Pattern]       |    |    |    |    |    |    |    |       |        | 14           |
|                        | D5   | [Pattern]       |    |    |    |    |    |    |    |       |        | 15           |
|                        | D6   | [Pattern]       |    |    |    |    |    |    |    |       |        | 16           |
|                        | D7   | [Pattern]       |    |    |    |    |    |    |    |       |        | 17           |
| 1, 1                   | D0   | [Pattern]       |    |    |    |    |    |    |    |       |        | 18           |
|                        | D1   | [Pattern]       |    |    |    |    |    |    |    |       |        | 19           |
|                        | D2   | [Pattern]       |    |    |    |    |    |    |    |       |        | 1A           |
|                        | D3   | [Pattern]       |    |    |    |    |    |    |    |       |        | 3 Page       |
|                        | D4   | [Pattern]       |    |    |    |    |    |    |    |       |        | 1C           |
|                        | D5   | [Pattern]       |    |    |    |    |    |    |    |       |        | 1D           |
|                        | D6   | [Pattern]       |    |    |    |    |    |    |    |       |        | 1E           |
|                        | D7   | [Pattern]       |    |    |    |    |    |    |    |       |        | 1F           |
| Column Address         | A    | DO=0            | 3C | 3B | 3A | 39 | 38 | 37 | 36 | 35    | ←----- | 00           |
|                        | D    |                 |    |    |    |    |    |    |    |       |        |              |
|                        | C    | DO=1            | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 1A    | -----→ | 4F           |
| Segment Term.          |      | 60              | 59 | 58 | 57 | 56 | 55 | 54 | 53 | ----- | 0      |              |

Fig.1. Correspondence with Display Data RAM and address



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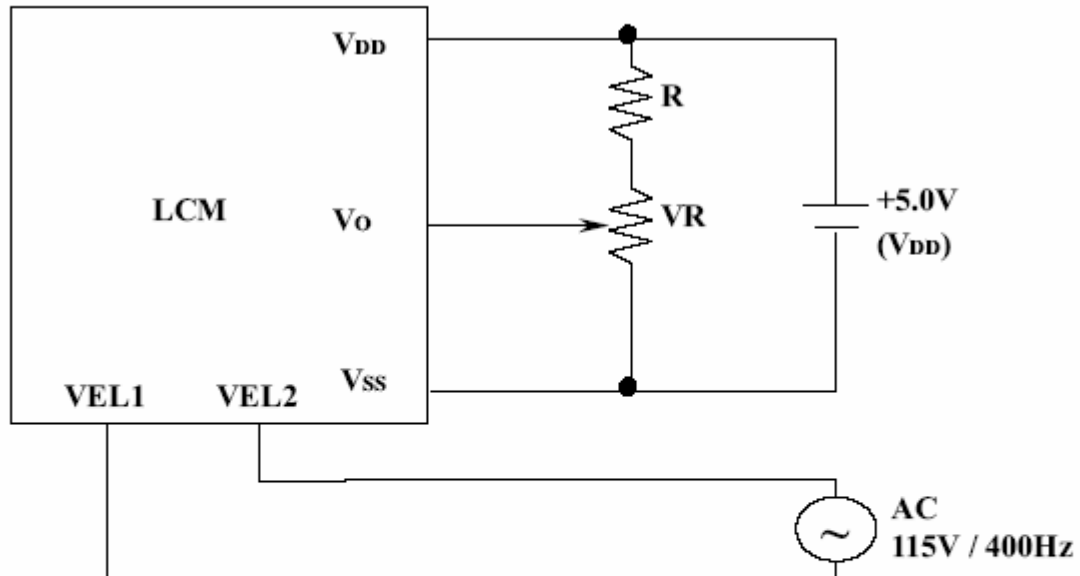
*Initialization by instructions*





MODEL NO : ASI-B-1223BS-EC-\_WS/W

*Power supply for LCM*



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

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

VR:  $10K\Omega \sim 20K\Omega$