



ALL SHORE INDUSTRIES, INC.

SPECIFICATION FOR LIQUID CRYSTAL DISPLAY MODULE

MODULE # : ASI-_-1223DS-AA__S/W

- (1) NUMBER OF DOTS -----122 W * 32 H DOTS
- (2) MODULE SIZE -----59.0 W * 29.3 H * 5.5 T (max) mm
- (3) EFFECTIVE AREA -----52.0 W * 15.0 H mm
- (4) ACTIVE AREA -----45.72 W * 11.97 H mm
- (5) DOT SIZE-----0.345 W * 0.345 Hmm
- (6) DOT PITCH -----0.375 W * 0.375 H mm



MODEL NO : ASI-D-1223DS-AA-_S/W

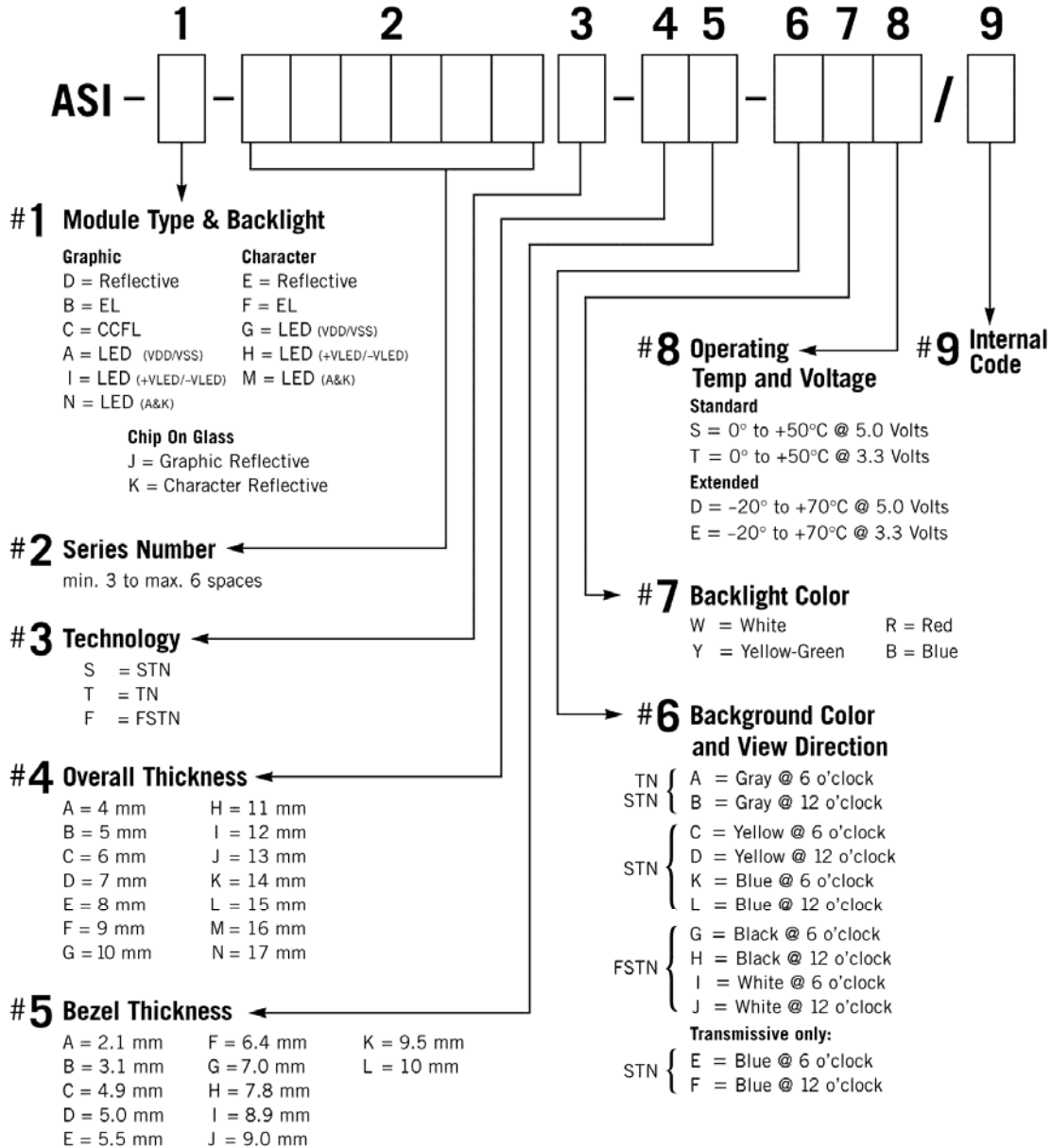
RECORD OF REVISION

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



MODEL NO : ASI-D-1223DS-AA-_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-1223DS-AA-_S/W

General specifications

PLEASE REFER TO:

“CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-1520S)”.

This individual specification is prior to general specifications

Mechanical data

- (1) NUMBER OF DOTS -----122 W * 32 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 _{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>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 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°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/s²



MODEL NO : ASI-D-1223DS-AA-_S/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 | V_{IH} | H LEVEL | 2.0 | ----- | V_{DD} | V | |
| | V_{IL} | L LEVEL | 0 | ----- | 0.8 | | |
| OUTPUT VOLTAGE | V_{OH} | $I_{OH} = -0.3 \text{ mA}$ | 2.4 | ----- | ----- | V | |
| | V_{OL} | $I_{OL} = 3.0 \text{ mA}$ | ----- | ----- | 0.4 | V | |
| POWER SUPPLY CURRENT | I_{DD} | $V_{DD}-V_{SS} = 5.0\text{V}$ | ----- | 1.0 | 3.0 | mA | |
| CLOCK OSCILLATION FREQUENCY | f_{osc} | FOR LCD MODULE | 15 | 18 | 21 | KHz | |
| RECOMMENDED LCD DRIVING VOLTAGE | $V_{DD}-V_o$ | $\Phi=10^\circ$ $\theta=0^\circ$ | $T_a=0^\circ\text{C}$ | ----- | 4.8 | ----- | V |
| | | | $T_a=25^\circ\text{C}$ | ----- | 4.6 | ----- | V |
| | | | $T_a=50^\circ\text{C}$ | ----- | 4.1 | ----- | V |

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

Optical characteristics

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

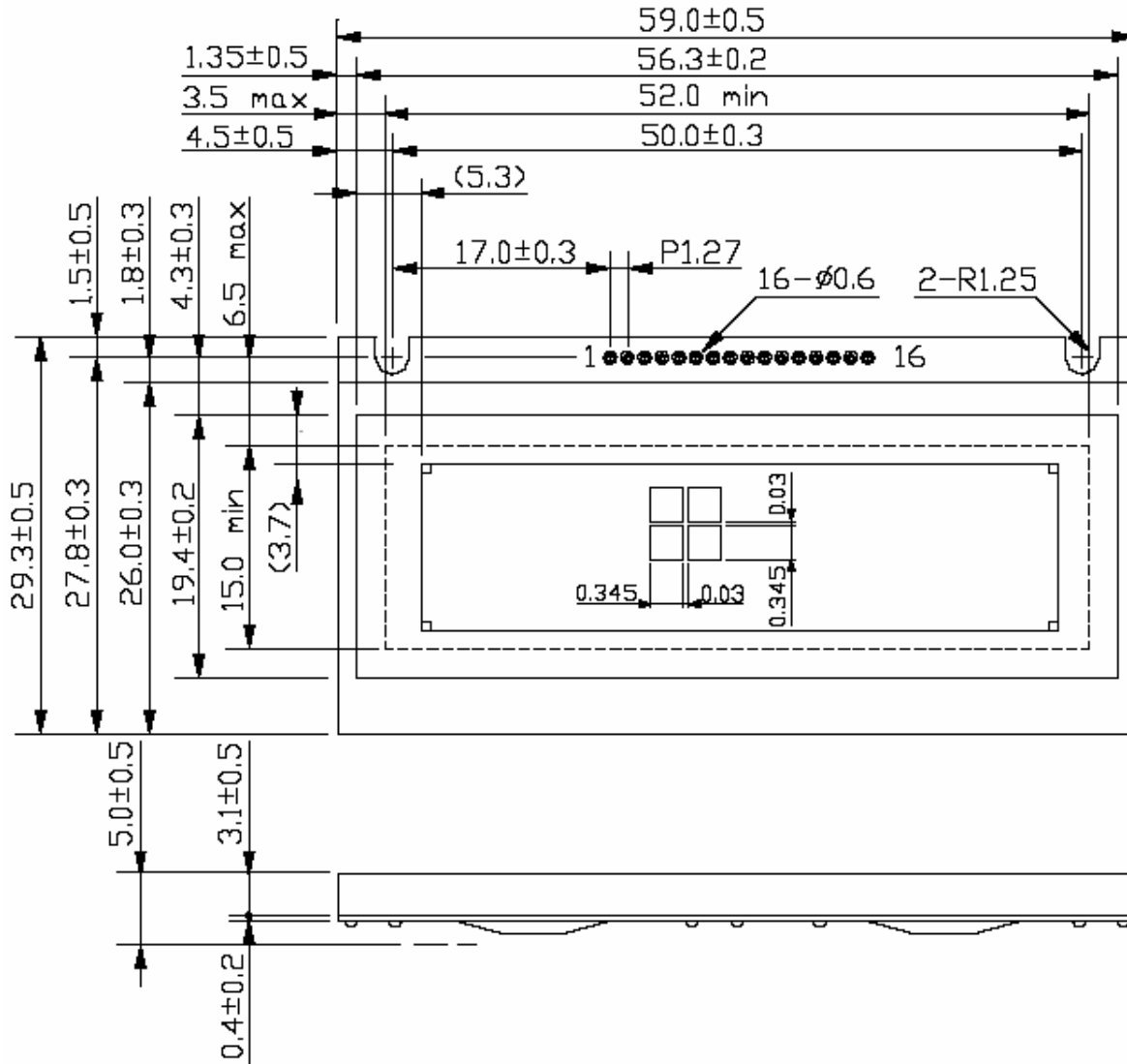
| ITEM | SYMBOL | CONDITION | MIN. | TYP. | MAX. | UNIT | NOTE |
|----------------|-----------------|---|-------|------|-------|-------|------|
| VIEWING ANGLE | $\Phi 2-\Phi 1$ | $K = 2.0$ | 30 | 40 | ----- | deg. | 2 |
| CONTRAST RATIO | K | $\Phi = 10^\circ$ $\theta = 0^\circ$ | 3 | 4 | ----- | ----- | 2 |
| RESPONSE TIME | tr (rise) | $\Phi = 10^\circ$ $\theta = 0^\circ$ | ----- | 200 | 350 | ms | 2 |
| | tf (fall) | $\Phi = 10^\circ$ $\theta = 0^\circ$ | ----- | 300 | 400 | ms | 2 |

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

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

MODEL NO : ASI-D-1223DS-AA-_S/W

Dimension outline



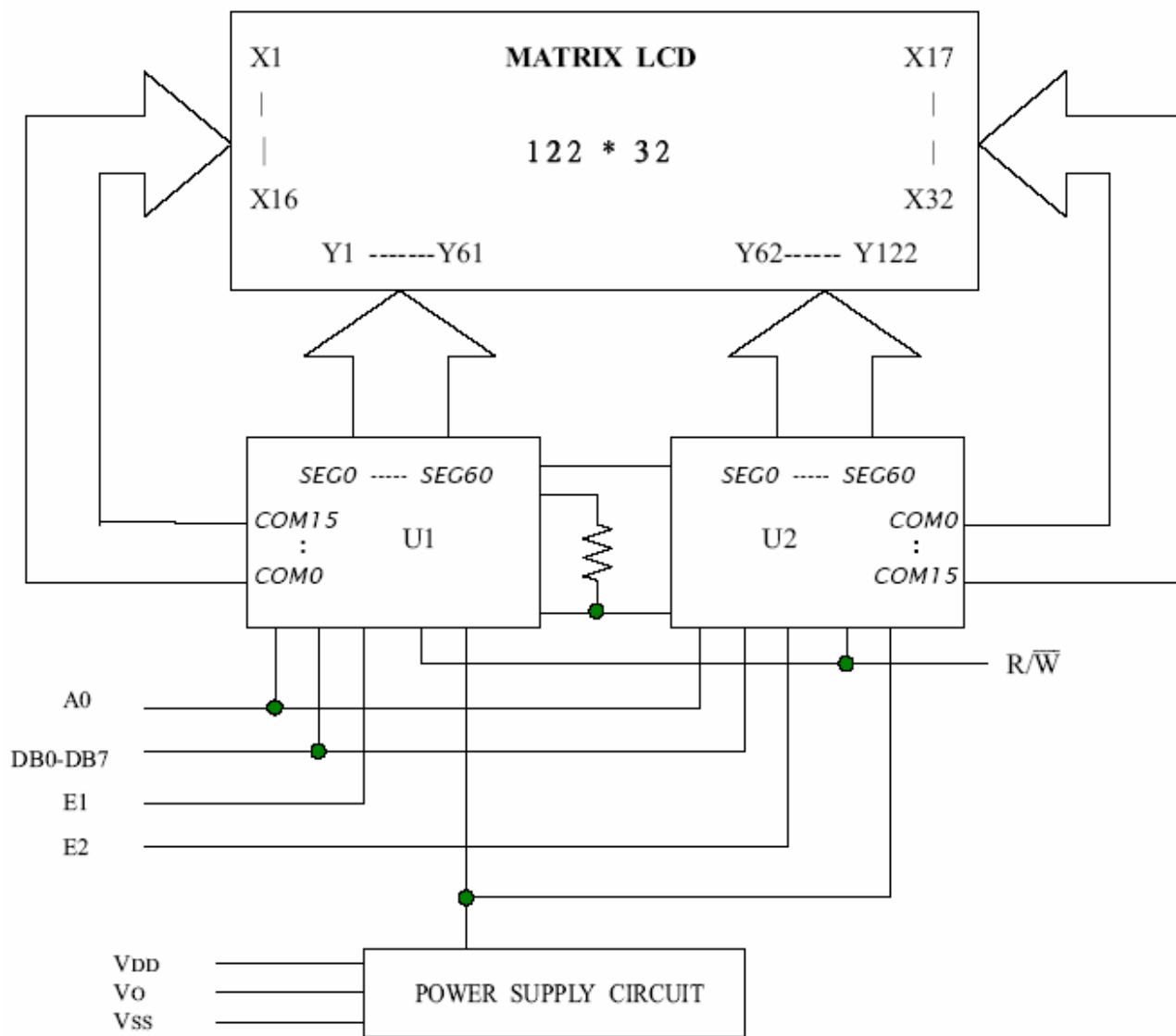
Interface pin connection

| | | | | | | | | |
|----------------|----------|-----------------|-----------------|----------------|-----------|-----------|-----------|--------------|
| PIN NO. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| SYMBOL | K | V _{SS} | V _{DD} | V _O | A0 | E1 | E2 | DB0 |
| PIN NO. | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| SYMBOL | DB1 | DB2 | DB3 | DB4 | DB5 | DB6 | DB7 | R/ \bar{W} |



MODEL NO : ASI-D-1223DS-AA-_S/W

Block diagram



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MODEL NO : ASI-D-1223DS-AA-_S/W

Display data RAM

| Page Address D1,D2= | DATA | Display Pattern | | | | | | | | Line Address | | | |
|------------------------|------|---|----|----|----|----|----|----|----|--------------|--------|----|--------|
| 0, 0 | D0 | | | | | | | | | 00H | | | |
| | D1 | | | | | | | | | 01 | | | |
| | D2 | | | | | | | | | 02 | | | |
| | D3 | | | | | | | | | 03 | | | |
| | D4 | | | | | | | | | 04 | | | |
| | D5 | | | | | | | | | 05 | | | |
| | D6 | | | | | | | | | 06 | | | |
| | D7 | | | | | | | | | 07 | | | |
| 0, 1 | D0 | <p style="text-align: center;">0 Page</p> | | | | | | | | 08 | | | |
| | D1 | | | | | | | | | 09 | | | |
| | D2 | | | | | | | | | 0A | | | |
| | D3 | | | | | | | | | 0B | | | |
| | D4 | | | | | | | | | 0C | | | |
| | D5 | | | | | | | | | 0D | | | |
| | D6 | | | | | | | | | 0E | | | |
| | D7 | | | | | | | | | 0F | | | |
| 1, 0 | D0 | <p style="text-align: center;">1 Page</p> | | | | | | | | 10 | | | |
| | D1 | | | | | | | | | 11 | | | |
| | D2 | | | | | | | | | 12 | | | |
| | D3 | | | | | | | | | 13 | | | |
| | D4 | | | | | | | | | 14 | | | |
| | D5 | | | | | | | | | 15 | | | |
| | D6 | | | | | | | | | 16 | | | |
| | D7 | | | | | | | | | 17 | | | |
| 1, 1 | D0 | <p style="text-align: center;">2 Page</p> | | | | | | | | 18 | | | |
| | D1 | | | | | | | | | 19 | | | |
| | D2 | | | | | | | | | 1A | | | |
| | D3 | | | | | | | | | 1B | | | |
| | D4 | | | | | | | | | 1C | | | |
| | D5 | | | | | | | | | 1D | | | |
| | D6 | | | | | | | | | 1E | | | |
| | D7 | | | | | | | | | 1F | | | |
| Column Address | A | DO=0 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | -----> | 3C | normal |
| | C | DO=1 | 4F | 4E | 4D | 4C | 4B | 4A | 49 | 48 | <----- | 13 | |
| Segment Term. | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ----- | 60 | | |

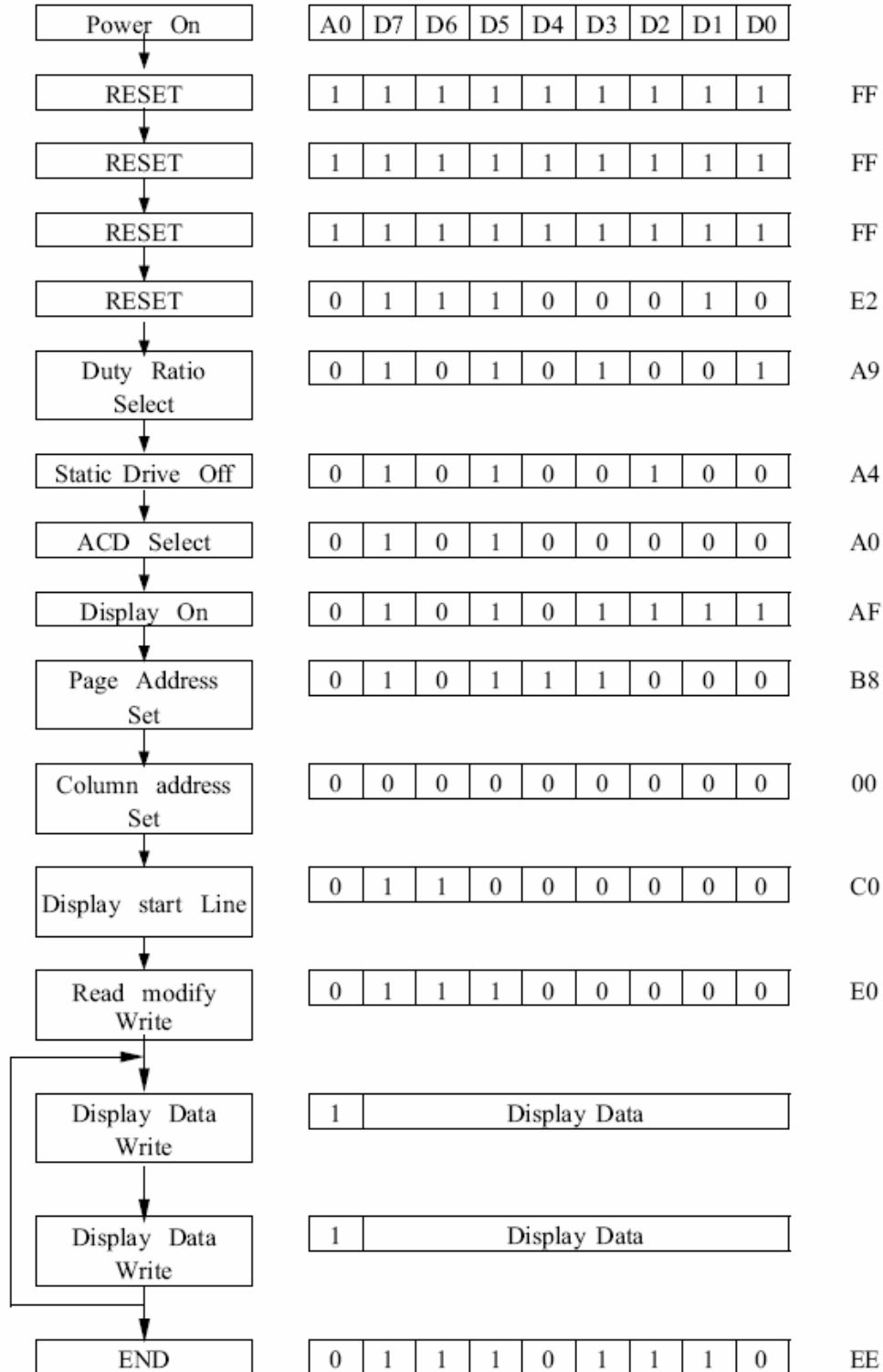
Fig.1. Correspondence with Display Data RAM and address

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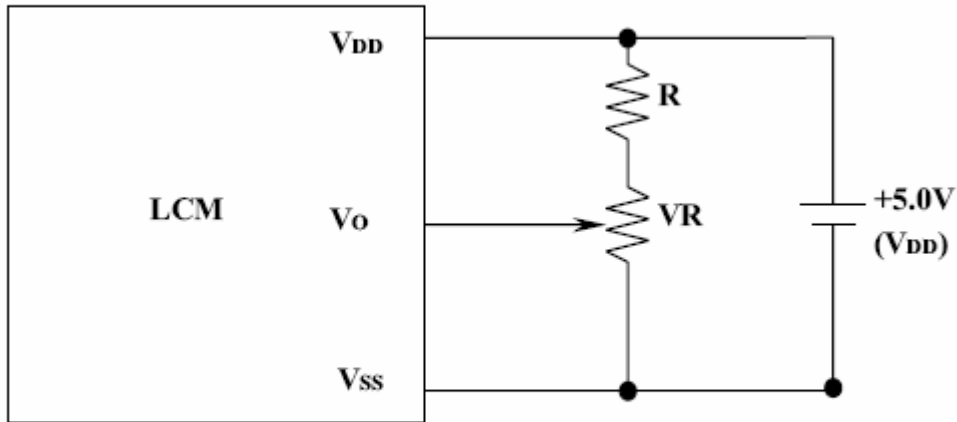
Initialization by instructions





MODEL NO : ASI-D-1223DS-AA-_S/W

Power supply for LCM



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

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

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