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EVERBOUQUET INTERNATIONAL CO., LTD.

PART NO. : MG1203D-SERIES

FOR MESSRS. : _____

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ACCEPTED BY : _____

PROPOSED BY : _____

RECORD OF REVISION

DATE	PAGE	SUMMARY

3. General specifications

3.1 General specifications

PLEASE REFER TO:

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

3.2 This individual specification is prior to general specifications

3.3 NUMBERING SYSTEM

MG1203D

W

 -

S	Y	M	L	W	U
---	---	---	---	---	---

(1) (2) (3) (4) (5) (6) (7)

(1).LCM TEMPERATURE :

“nil” : NORMAL TEMP

“W” : WIDE TEMP

(2).LCD TYPE :

“S” : STN TYPE

“F” : FSTN TYPE

(3).LCD COLOR :

“Y” : YELLOW-GREEN “B” : BLUE(STN/NEGATIVE)/BLACK(FSTN/NEGATIVE)

“G” : GRAY “W” : WHITE(FSTN/POSITIVE)

(4).LCD POLARIZE TYPE :

“nil” : TRANSFLECTIVE

“M” : TRANSMISSIVE

(5).BACKLIGHT TYPE :

“E” : EL BACKLIGHT

“L” : LED BACKLIGHT

“R” : REFLECTIVE

(6).BACKLIGHT COLOR :

LED TYPE :

“nil” : YELLOW-GREEN “A” : AMBER “B” : BLUE

“G” : PURE-GREEN “O” : ORANGE “R” : RED

“W” : WHITE

EL TYPE :

“nil” : WHITE

“B” : BLUE-GREEN

(7).VIEWING DIRECTION :

“nil” : 6 O’CLOCK

“3” : 3 O’CLOCK

“U” : 12 O’CLOCK

“9” : 9 O’CLOCK

4. Mechanical data

- (1) NUMBER OF DOTS -----122 W * 32 H DOTS
- (2) MODULE SIZE -----68.0 W * 31.75 H * “C” 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 H mm
- (6) DOT PITCH-----0.43 W * 0.43 H mm

NOTE : The dimension of ”C”, please refer to Outline dimension on PAGE 8/12

5. Absolute maximum ratings

5.1 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	-----
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
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.

5.2 Environmental absolute maximum ratings

I T E M	CONDITION	OPERATING		STORAGE		COMMENT
		MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	NORMAL	0°C	50°C	-20°C	70°C	-----
	WIDE	-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

6. Electrical characteristics

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

<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>		<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>
POWER SUPPLY VOLTAGE FOR CIRCUIT	V _{DD} -V _{SS}	-----		4.75	5.0	5.25	V
INPUT VOLTAGE NOTE (2)	V _{IH}	H LEVEL		2.0	-----	V _{DD}	V
	V _{IL}	L LEVEL		0	-----	0.8	
OUTPUT VOLTAGE NOTE (1)	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
RECOMMENDED LCD DRIVING VOLTAGE, NOTE (4)	V _{DD} -V _O	STN/ FSTN DUTY =1/32 Φ=10° NOTE(5)	Ta=-20°C	-----	5.0	-----	V
			Ta= 0°C	-----	4.8	-----	V
			Ta= 25°C	-----	4.6	-----	V
			Ta= 50°C	-----	4.4	-----	V
			Ta= 70°C	-----	4.2	-----	V
POWER SUPPLY CURRENT FOR EL BACKLIGHT	I _{EL}	V _{EL} = 115V _{rms} f _{EL} = 400Hz		-----	1.5	-----	mArms
POWER SUPPLY CURRENT FOR LED	I _{LED}	V _{DD} =5.0V		-----	NOTE(6)	NOTE(6)	mA

NOTE (1): APPLIED TO TERMINALS DB0~DB7

NOTE (2): APPLIED TO TERMINALS E, A0, DB0~DB7

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

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

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

$\theta = 180^{\circ}$: VIEWING DIRECTION AT 12 O’CLOCK

(6): LED CURRENT FOR DIFFERENT LED BACKLIGHT TYPE

LED B.L TYPE	V_{DD}	I_{LED}				LED COLOR
		MIN.	TYP.	MAX.	UNIT.	
A	5.0V	-----	40	50	mA	YELLOW-GREEN、AMBER、ORANGE、RED
B	5.0V	-----	30	40	mA	BLUE、WHITE、PURE-GREEN

7. Optical characteristics

STN TYPE LCD

$T_a = 25\text{ }^{\circ}\text{C}$ $V_{DD}-V_O = 4.6\text{V}$

I T E M	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、STN BLUE TYPE LCD

$T_a = 25\text{ }^{\circ}\text{C}$ $V_{DD}-V_O = 4.6\text{V}$

I T E M	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	$\Phi = 0^{\circ}$ $\theta = 0^{\circ}$	3.0	----	----	cd/m^2	YELLOW-GREEN, RED AMBER, ORANGE	NOTE(2) NOTE(3)
		4.0	----	----		EL BACKLIGHT	
		5.0	----	----		BLUE, WHITE, PURE-GREEN	

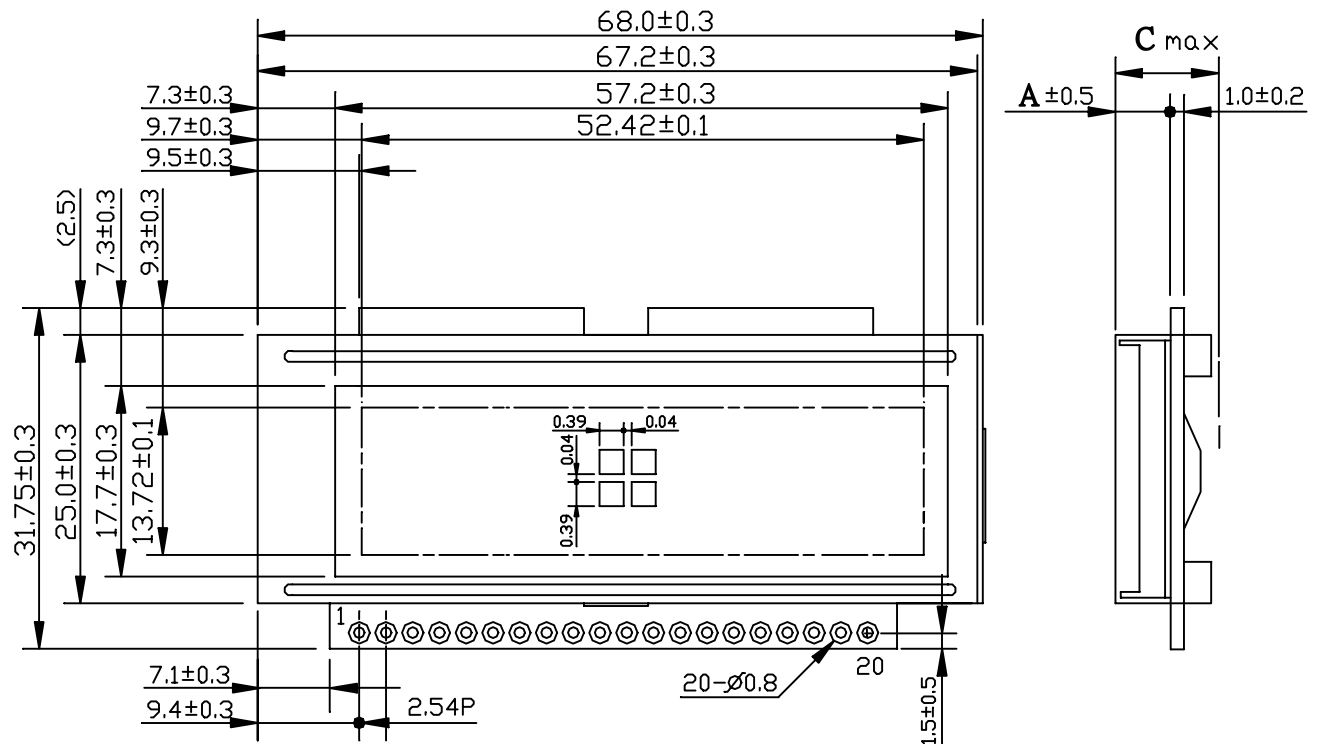
NOTE (1): $\theta = 0^{\circ}$: VIEWING DIRECTION AT 6 O'CLOCK

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

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

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

8. Outline dimension



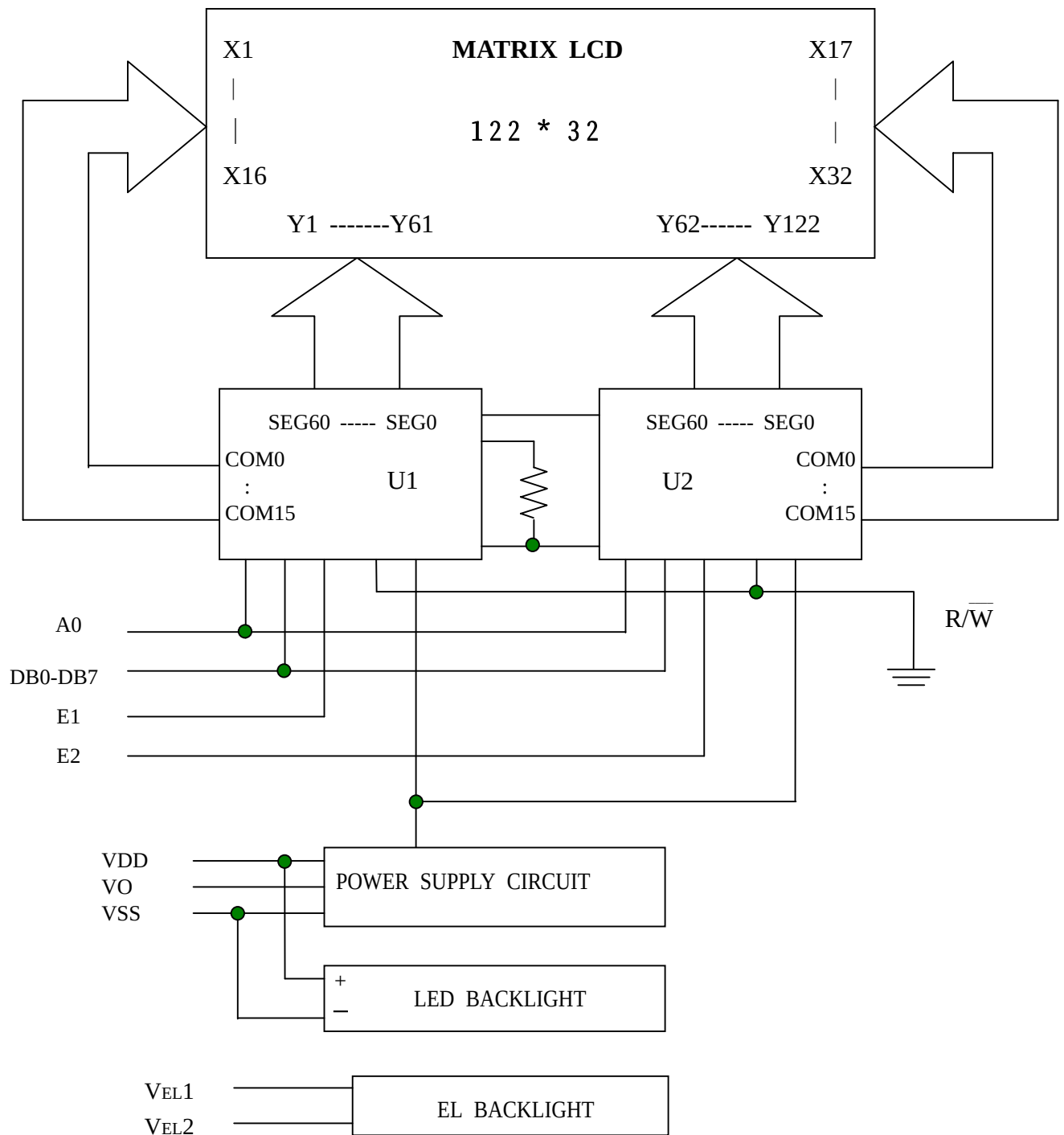
TYPE	A	C
LED B.L	5.5	10.0
EL & NO B.L	4.1	8.0

NOTE :
 1.UNIT : mm
 2.SCALE : NTS

Interface pin connection

PIN NO.	1	2	3	4	5	6	7	8	9	10
SYMBOL	V _{SS}	V _{DD}	V _O	NC	A0	E1	E2	DB0	DB1	NC
PIN NO.	11	12	13	14	15	16	17	18	19	20
SYMBOL	NC	DB2	DB3	DB4	DB5	DB6	DB7	NC	NC	NC

9. Block diagram



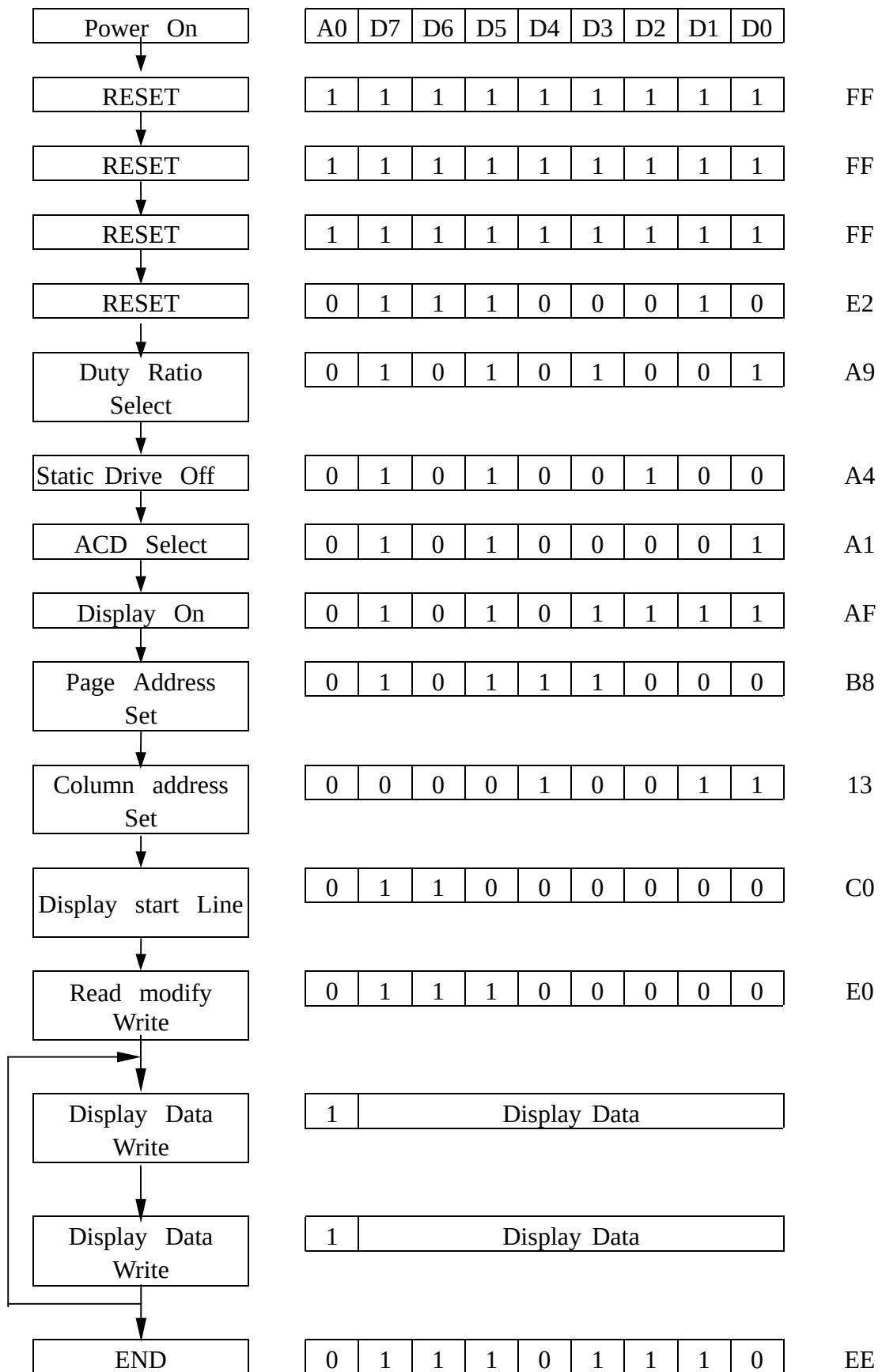
10. Display data RAM

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											08
	D1											09
	D2											0A
	D3											0B
	D4											0C
	D5											0D
	D6											0E
	D7											0F
1, 0	D0											10
	D1											11
	D2											12
	D3											13
	D4											14
	D5											15
	D6											16
	D7											17
1, 1	D0											18
	D1											19
	D2											1A
	D3											1B
	D4											1C
	D5											1D
	D6											1E
	D7											1F
Column Address	A	DO=0	3C	3B	3A	39	38	37	36	35	←-----	00
	C	DO=1	13	14	15	16	17	18	19	1A	-----→	4F
Segment Term.			60	59	58	57	56	55	54	53	-----	0

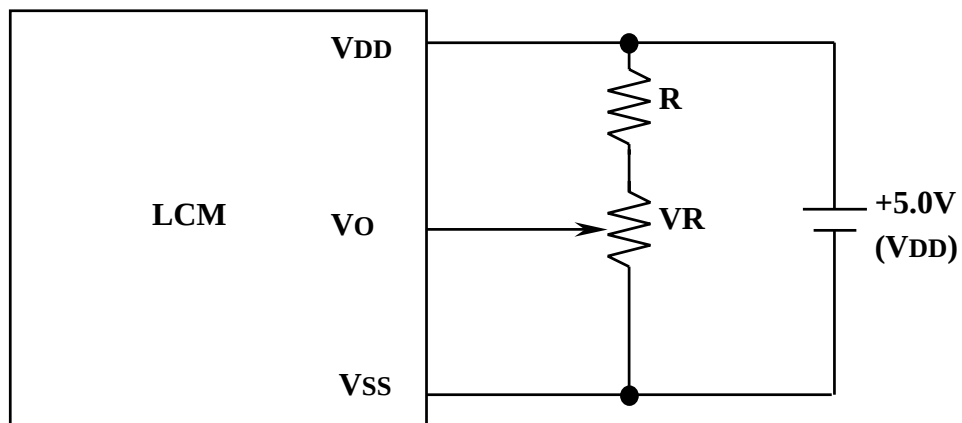
← normal

Fig.1. Correspondence with Display Data RAM and address

11. Initialization by instructions



12. Power supply for LCM



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

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

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

12.1 Power supply for backlight

