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## EVERBOUQUET INTERNATIONAL CO., LTD.

Address: 13F-3, No. 8, Lane 280, Sec. 6, Minchuan  
E. Rd., Nei-Hu 114, Taipei, Taiwan, R.O.C.  
TEL: 886-2-2633-1253 FAX: 886-2-2631-2881

PART NO. : MG1060A-SGL

FOR MESSRS. : \_\_\_\_\_

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ACCEPTED BY : \_\_\_\_\_ PROPOSED BY : \_\_\_\_\_

## RECORD OF REVISION

DATE	PAGE	SUMMARY
2003/01/28	4/10	5.Add <i>ITEM</i> : POWER SUPPLY FOR LED.
	5/10	6.Modify $I_{LED}$ CONDITION : $V_{DD}=3.3V \rightarrow V_{LED}=3.3V$ .
	6/10	8.Modify the FFC dimension.
	7/10	8.Add the <i>PIN NO.</i> : 21 $V_{LED}(+)$ and 22 $V_{LED}(-)$
	8/10	9.Modify the power supply for LED backlight.
		10.Add the power supply for LED backlight.
2003/02/20	3/10	4.Modify the module size : 10.0T➔8.0T
	6/10	8.Modify the outline dimension
	7/10	8.Modify the describe of $V_{LED}(-)$
2003/03/03	6/10	8.Modify the height of module : 4.5 $\rightarrow$ 3.8

### 3. General specifications

#### 3.1 General specifications

PLEASE REFER TO:

“CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-1560S)”.

#### 3.2 This individual specification is prior to general specifications

### 4. Mechanical data

(1) NUMBER OF DOT----- 100 \* 60 DOTS

△(2) MODULE SIZE ----- 41.0 W \* 40.0 H \* 8.0 T (max) mm

(3) EFFECTIVE AREA----- 34.0 W \* 25.0 H mm

(4) ACTIVE AREA ----- 29.97 W \* 20.97 H mm

(5) DOT SIZE ----- 0.27 W \* 0.32 H mm

(6) DOT PITCH----- 0.30 W \* 0.35 H mm

(7) VIEWING DIRECTION ----- 6 O’CLOCK

(8) LCD TYPE ----- STN.GRAY.TRANSFLECTIVE

(9) LED BACKLIGHT COLOR ----- YELLOW-GREEN

(10) CONTROLLER/DRIVER IC ----- SED 1560D0A

## 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 <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 LED	V <sub>LED</sub>	-----	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.

### 5.2 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	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<sup>2</sup>

## 6. Electrical characteristics

$T_a = 25$        $V_{DD} = 3.3 \pm 0.25V$

<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	$V_{DD}-V_{SS}$	-----	3.0	3.3	5.5	V
INPUT VOLTAGE (H LEVEL)	$V_{IH}$	-----	$0.2V_{DD}$	-----	-----	V
INPUT VOLTAGE (L LEVEL)	$V_{IL}$	-----	-----	-----	$0.8V_{DD}$	V
OUTPUT VOLTAGE (H LEVEL)	$V_{OH}$	$I_{OH} = 0.5mA$	$0.2V_{DD}$	-----	-----	V
OUTPUT VOLTAGE (L LEVEL)	$V_{OL}$	$I_{OH} = -0.5mA$	-----	-----	$0.8V_{DD}$	V
POWER SUPPLY CURRENT	$I_{DD}$	$V_{DD} = 3.3 V$	-----	0.2	0.4	mA
LCD DISPLAY DUTY RATIO	DUTY	-----	-----	1/64	-----	-----
POWER SUPPLY CURRENT FOR LED BACKLIGHT	$I_{LED}$	 $V_{LED} = 3.3 V$	-----	50	100	mA

## 7. Optical characteristics

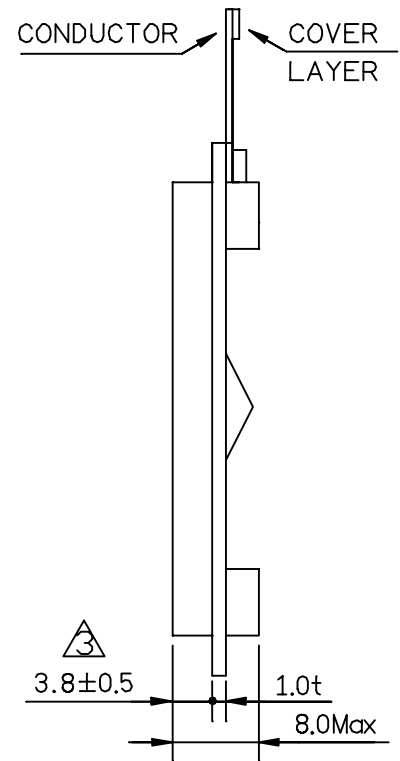
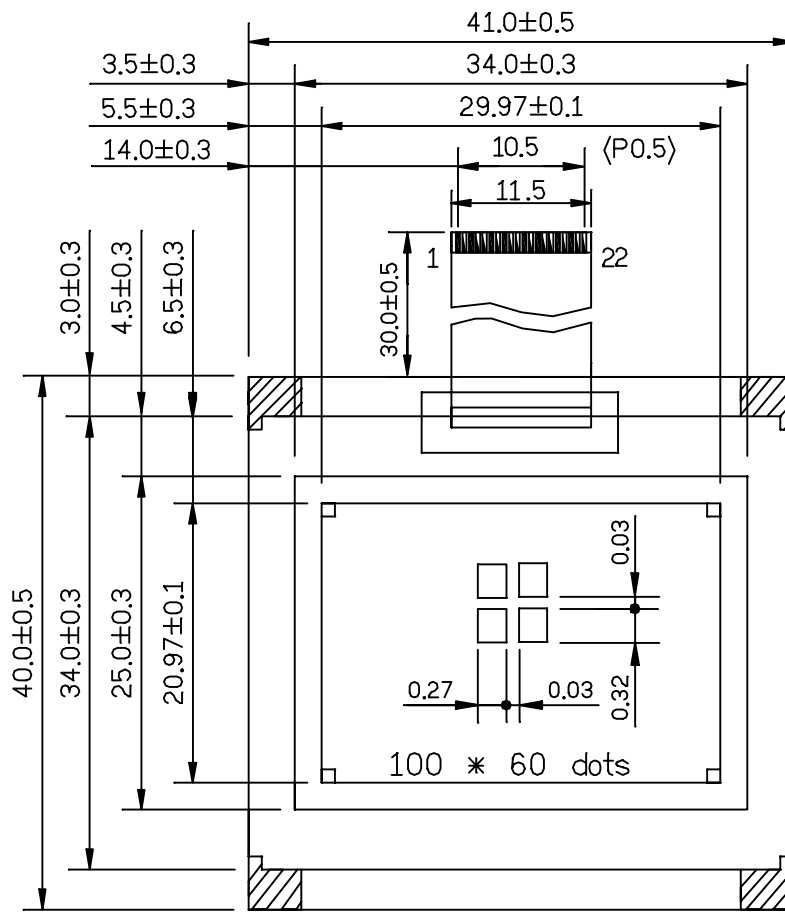
$T_a = 25$        $V_{DD} = 3.3V$

<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>	<i>NOTE</i>
VIEWING ANGLE	2- 1	$K = 2.0$ $= 0^\circ$	30	40	-----	deg.	1
CONTRAST RATIO	K	$= 10^\circ$ $= 0^\circ$	3.0	4.0	-----	-----	1
RESPONSE TIME	tr (rise)	$= 10^\circ$ $= 0^\circ$	-----	200	350	ms	1
	tf (fall)	$= 10^\circ$ $= 0^\circ$	-----	300	400	ms	1
BRIGHTNESS FOR LED BACKLIGHT	B	$= 0^\circ$ $= 0^\circ$	5.0	-----	-----	cd/m <sup>2</sup>	1,2

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

NOTE (2): UNDER NORMAL TEMPERATURE AND HUMIDITY IN A DARK ROOM.

## 8. Outline dimension



NOTE :

1.UNIT : mm

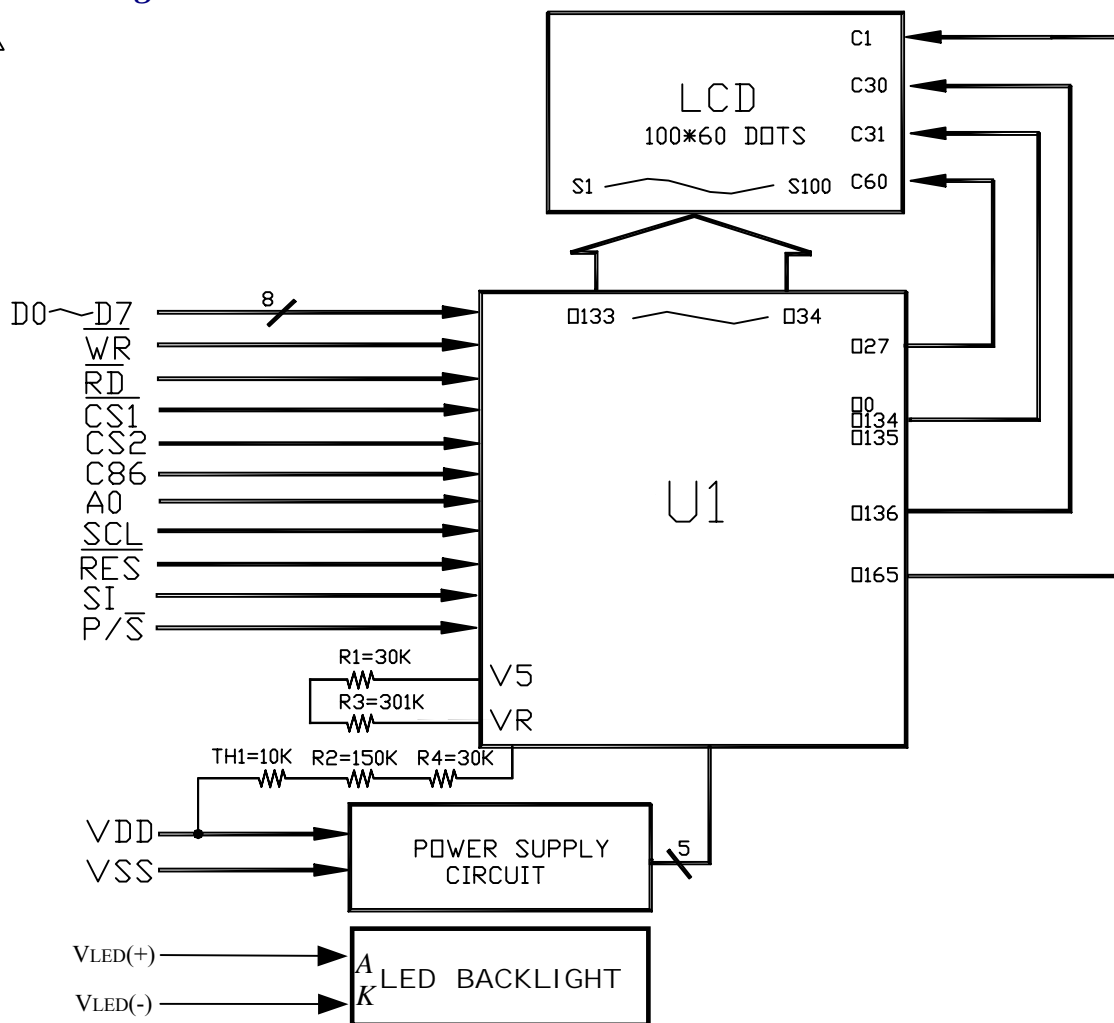
2.SCALE : NTS

## 8.1 Interface

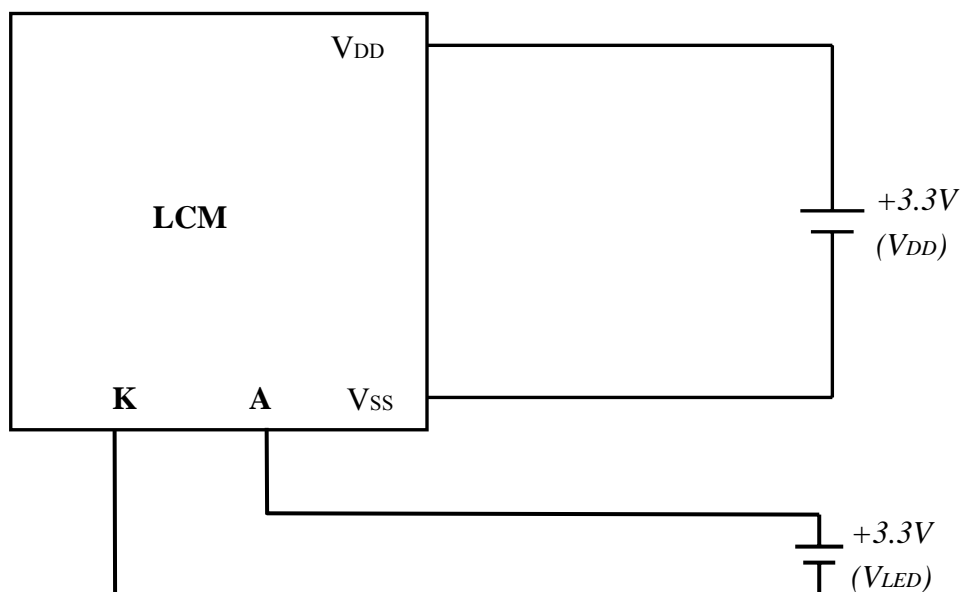
PIN NO.	SYMBOL	FUNCTION
1	V <sub>DD</sub>	POWER SUPPLY
2	$\overline{\text{RES}}$	L : RESET
3	SCL	SERIAL CLOCK INPUT
4	SI	SETIAL DATA INPUT
5	P/S	H : PARALLEL INPUT L : SERIAL INPUT
6	$\overline{\text{CS1}}$	DATA I/O IS ENABLED WHEN ( $\overline{\text{CS1}}$ =L, CS2=H)
7	CS2	DATA I/O IS ENABLED WHEN ( $\overline{\text{CS1}}$ =L, CS2=H)
8	C86	H : INTERFACING TO 6800-SERIES L : INTERFACING TO 8080-SERIES
9	AO	H : DO TO D7 IS CONTROL DATA L : DO TO D7 IS DISPLAY DATA
10	$\overline{\text{WR}}$ (R/ $\overline{\text{W}}$ )	(When 8080-series) : $\overline{\text{WR}}$ IS (L) (When 6800-series) : Read mode : R/ $\overline{\text{W}}$ IS (H) Write mode : R/ $\overline{\text{W}}$ IS (L)
11	$\overline{\text{RD}}$ (E)	$\overline{\text{RD}}$ :(When to 8080-series) E : (When to 6800-series)
12	V <sub>SS</sub>	GROUND
13	DO	DATA INPUT/OUTPUT
14	D1	DATA INPUT/OUTPUT
15	D2	DATA INPUT/OUTPUT
16	D3	DATA INPUT/OUTPUT
17	D4	DATA INPUT/OUTPUT
18	D5	DATA INPUT/OUTPUT
19	D6	DATA INPUT/OUTPUT
20	D7	DATA INPUT/OUTPUT
21	V <sub>LED</sub> (+)	POWER SUPPLY FOR LED BACKLIGHT (+)
22	V <sub>LED</sub> (-)	POWER SUPPLY FOR LED BACKLIGHT (-)



## 9. Block diagram



## 10. Power supply for LCM





## 11. Initialization by instruction

