

# EVERBOUQUET INTERNATIONAL CO., LTD.

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PART NO. : MC1604B-SBLW

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

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

## RECORD OF REVISION

DATE	PAGE	SUMMARY
2002/10/03	5	Modify the Electrical characteristics (Power supply current for LED backlight) : (1) $V_{LED} : 5.0V \rightarrow 4.0V$ (2) $I_{LED} (TYP.) : 60\text{ mA} \rightarrow 45\text{ mA}$ (3) $I_{LED} (MAX.) : 90\text{ mA} \rightarrow 60\text{ mA}$
2002/10/03	7	Modify the Power supply for LCM

### **3. General specifications**

#### **3.1 General specifications**

PLEASE REFER TO:

“CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-12780)”.

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

### **4. Mechanical data**

- (1) NUMBER OF CHARACTER----- 16 CH \* 4 LINE
- (2) MODULE SIZE----- 87.0 W \* 60.0 H \* 15.0 T (Max) mm
- (3) EFFECTIVE AREA ----- 61.8 W \* 25.2 H mm
- (4) CHARACTER PATTERN----- 5 \* 7 DOTS + CURSOR
- (5) CHARACTER SIZE ----- 2.96 W \* 4.16 H mm
- (6) CHARACTER PITCH----- 3.55 mm
- (7) DOT SIZE----- 0.56 W \* 0.56 H mm
- (8) DOT PITCH ----- 0.60 W \* 0.60 H mm
- (9) VIEWING DIRECTION-----6 O’CLOCK
- (10) LCD TYPE-----STN.BLUE.TRANSMISSIVE.
- (11) LED BACKLIGHT COLOR -----WHITE

## 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 BACKLIGHT	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°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: 90% RH MAX.

Ta > 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/s<sup>2</sup>

## 6. Electrical characteristics

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

<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>	
INPUT VOLTAGE	$V_{IH}$	-----	2.2	-----	-----	V	
	$V_{IL}$	-----	-----	-----	0.6	V	
OUTPUT VOLTAGE	$V_{OH}$	$-I_{OH} = 0.2 \text{ mA}$	2.4	-----	-----	V	
	$V_{OL}$	$I_{OH} = 1.2 \text{ mA}$	-----	-----	0.4	V	
POWER SUPPLY CURRENT	$I_{DD}$	$V_{DD} = 5.0 \text{ V}$	-----	1.5	2.0	mA	
RECOMMENDED LCD DRIVING VOLTAGE	$V_{DD}-V_O$	DUTY =1/16 $\phi=10^\circ$	$T_a=0^\circ\text{C}$	-----	4.7	-----	V
			$T_a=25^\circ\text{C}$	-----	4.5	-----	V
			$T_a=50^\circ\text{C}$	-----	4.3	-----	V
POWER SUPPLY CURRENT FOR LED BACKLIGHT	$I_{LED}$	$V_{LED} = 4.0\text{V}$ $\triangle$	-----	45 $\triangle$	60 $\triangle$	mA	

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

## 7. Optical characteristics

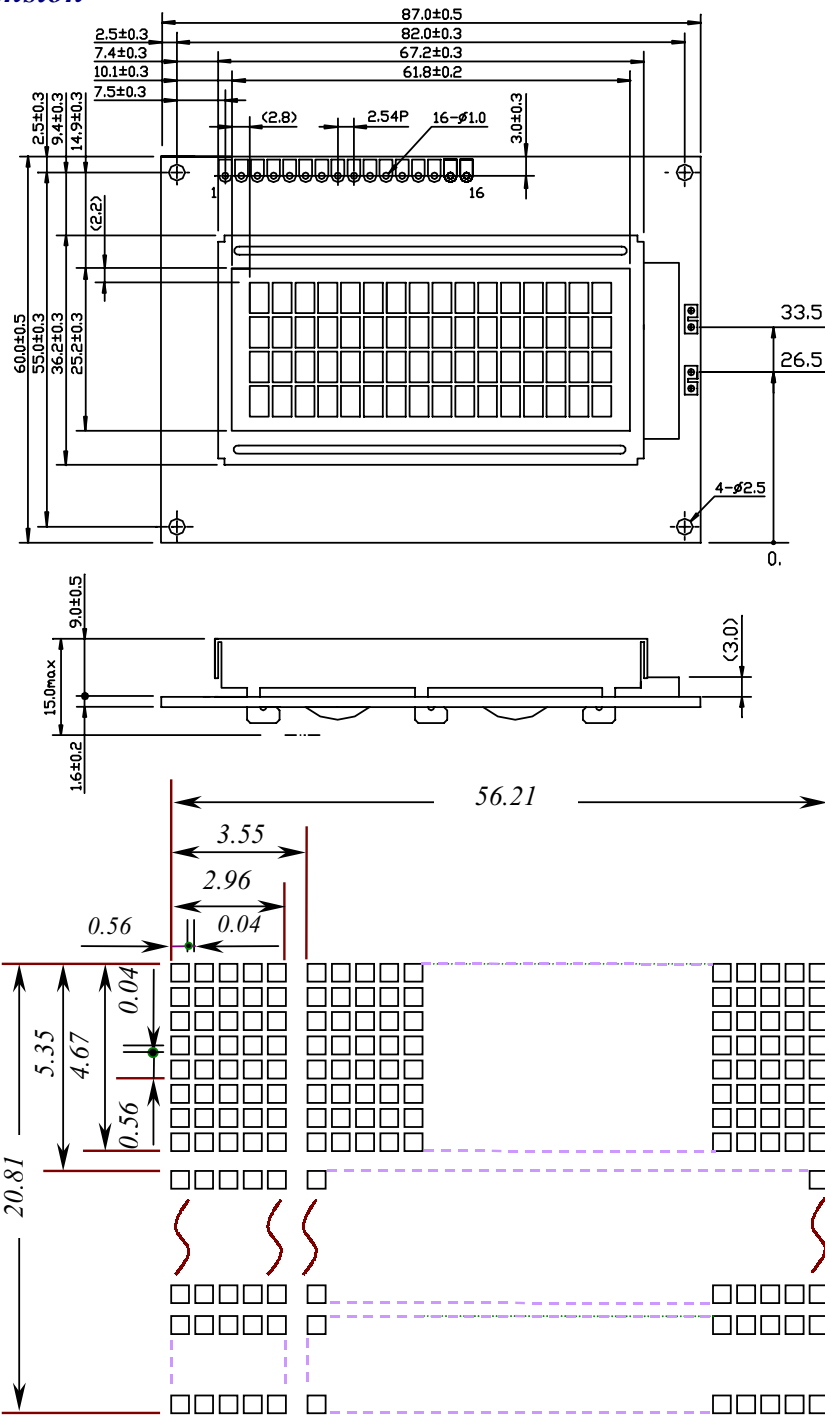
$T_a = 25^\circ\text{C}$   $V_{DD}-V_O = 4.5\text{V}$

<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>	<i>NOTE</i>
VIEWING ANGLE	$\Phi 2-\Phi 1$	$K = 2.0$ $\theta = 0^\circ$	30	40	-----	deg.	1
CONTRAST RATIO	K	$\Phi = 10^\circ$ $\theta = 0^\circ$	4	5	-----	-----	1
RESPONSE TIME	tr (rise)	$\Phi = 10^\circ$ $\theta = 0^\circ$	-----	200	350	ms	1
	tf (fall)	$\Phi = 10^\circ$ $\theta = 0^\circ$	-----	300	400	ms	1
BRIGHTNESS FOR LED BACKLIGHT	B	$\Phi = 0^\circ$ $\theta = 0^\circ$	6.0	-----	-----	$\text{cd/m}^2$	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



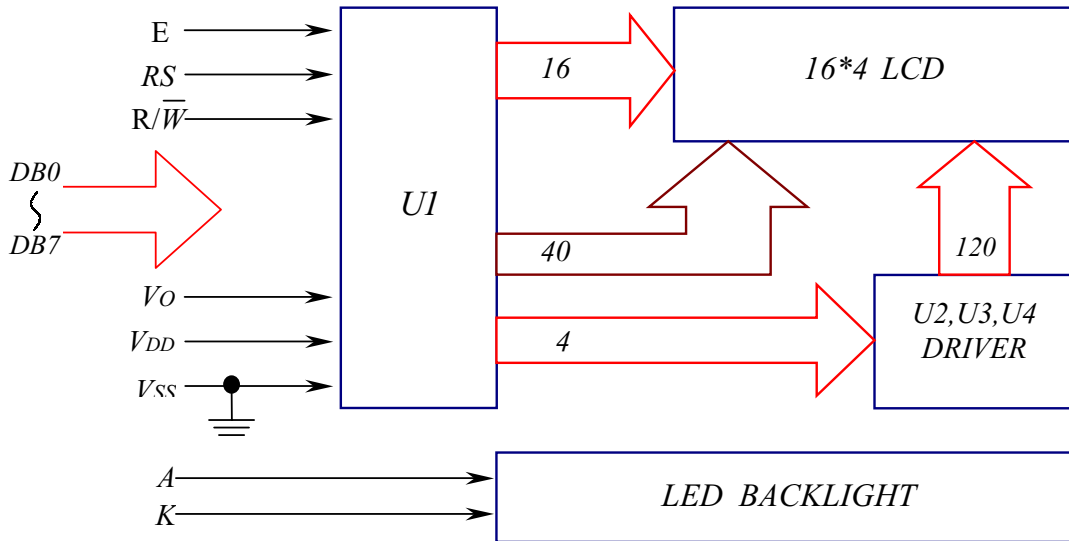
單位：mm

SCALE：NTS

### Interface pin connection

<b>PIN NO.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
SYMBOL	V <sub>SS</sub>	V <sub>DD</sub>	V <sub>O</sub>	RS	R/ $\bar{W}$	E	DB0	DB1
<b>PIN NO.</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
SYMBOL	DB2	DB3	DB4	DB5	DB6	DB7	A	K

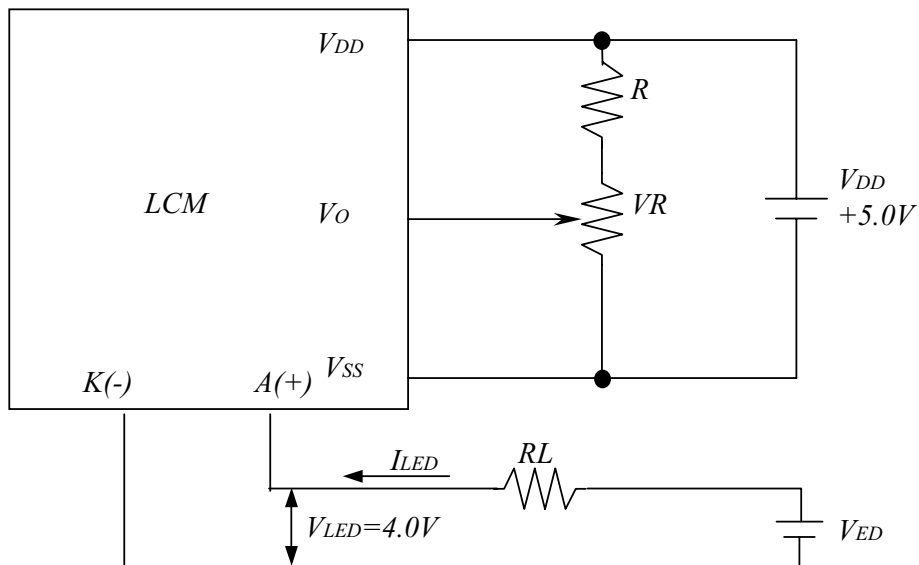
## 9 Block diagram



### Display data address charts

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE 1	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
LINE 2	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F
LINE 3	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
LINE 4	50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F

## 10. Power supply for LCM



RECOMMENDED RESISTOR R:  $V_{DD} - V_0 \geq 1.5V$

$R_L \geq ((V_{ED} - 4.0V) / I_{LED})$ ,  $I_{LED} \leq 60mA$

$V_{DD} - V_0$ : LCD DRIVING VOLTAGE

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