



WE CATCH THE  
BEST TECH. FOREVER

# EVERBOUQUET INTERNATIONAL CO., LTD.

PART NO. : MC1602X-SL

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

## CONTENTS

<i>NO.</i>	<i>ITEM</i>	<i>PAGE</i>
1.	COVER	1
2.	RECORD OF REVISION	2
3.	GENERAL SPECIFICATION	3
4.	MECHANICAL DATA	3
5.	ABSOLUTE MAXIMUM RATINGS	4
6.	ELECTRICAL CHARACTERISTICS	5
7.	OPTICAL CHARACTERISTICS	5
8.	OUTLINE DIMENSION	6
9.	BLOCK DIAGRAM	7
10.	POWER SUPPLY FOR LCM	7

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-10-12780)”.

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

### **4. Mechanical data**

- (1) NUMBER OF CHARACTERS-----16 CH \* 2 LINE
- (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) CHARACTER PATTERN-----5 \* 7 DOTS + CURSOR
- (5) CHARACTER SIZE -----2.45 W \* 4.08 H mm
- (6) CHARACTER PITCH-----2.95 mm
- (7) DOT SIZE -----0.45 W \* 0.54 H mm
- (8) DOT PITCH -----0.50 W \* 0.59 H mm
- (9) VIEWING DIRECTION -----6 O’CLOCK
  
- (11) LED COLOR -----YELLOW-GREEN

## 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°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/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>	
POWER SUPPLY VOLTAGE FOR CIRCUIT	$V_{DD}-V_{SS}$	—————	4.75	5.0	5.25	V	
INPUT VOLTAGE	$V_{IH}$	—————	2.0	—————	$V_{DD}$	V	
	$V_{IL}$	—————	$V_{SS}$	—————	0.8	V	
OUTPUT VOLTAGE	$V_{OH}$	$-I_{OH} = 0.2\text{ mA}$	2.4	—————	—————	V	
	$V_{OL}$	$I_{OL} = 1.6\text{ mA}$	—————	—————	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	$T_a=0^\circ\text{C}$	$\Phi=10^\circ$	—————	4.9	—————	V
			$\Phi=-10^\circ$	—————	5.0	—————	
		$T_a=25^\circ\text{C}$	$\Phi=10^\circ$	—————	4.5	—————	V
			$\Phi=-10^\circ$	—————	4.6	—————	
		$T_a=50^\circ\text{C}$	$\Phi=10^\circ$	—————	4.1	—————	V
			$\Phi=-10^\circ$	—————	4.2	—————	
POWER SUPPLY CURRENT FOR LED	$I_{LED}$	$V_{DD}=5.0\text{V}$	—————	40	60	mA	

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

## 7. Optical characteristics

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

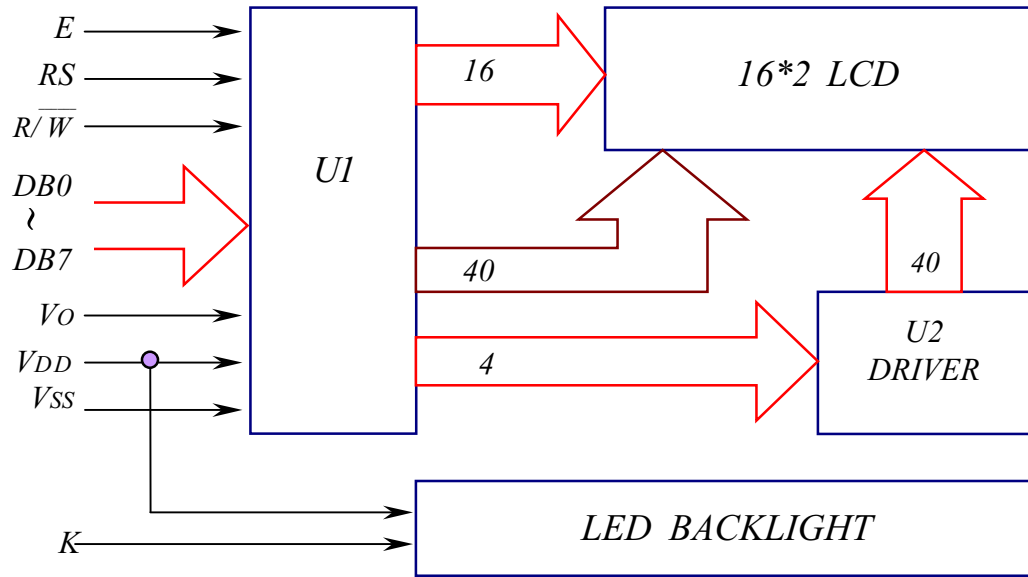
<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT.</i>	<i>NOTE</i>
VIEWING ANGLE	$\Phi 2-\Phi 1$	$K = 2.0$	30	40	—————	deg.	2
CONTRAST RATIO	K	$\Phi=10^\circ$ ( $-10^\circ$ ) $\theta=0^\circ$	3.0	4.0	—————	—————	2
RESPONSE TIME	tr (rise)	$\Phi=10^\circ$ ( $-10^\circ$ ) $\theta=0^\circ$	—————	200	350	ms	2
	tf (fall)	$\Phi=10^\circ$ ( $-10^\circ$ ) $\theta=0^\circ$	—————	300	400	ms	2
BRIGHTNESS FOR LED BACKLIGHT	B	$\Phi = 0^\circ$ $\theta = 0^\circ$	4.0	—————	—————	$\text{cd/m}^2$	2,3

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

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



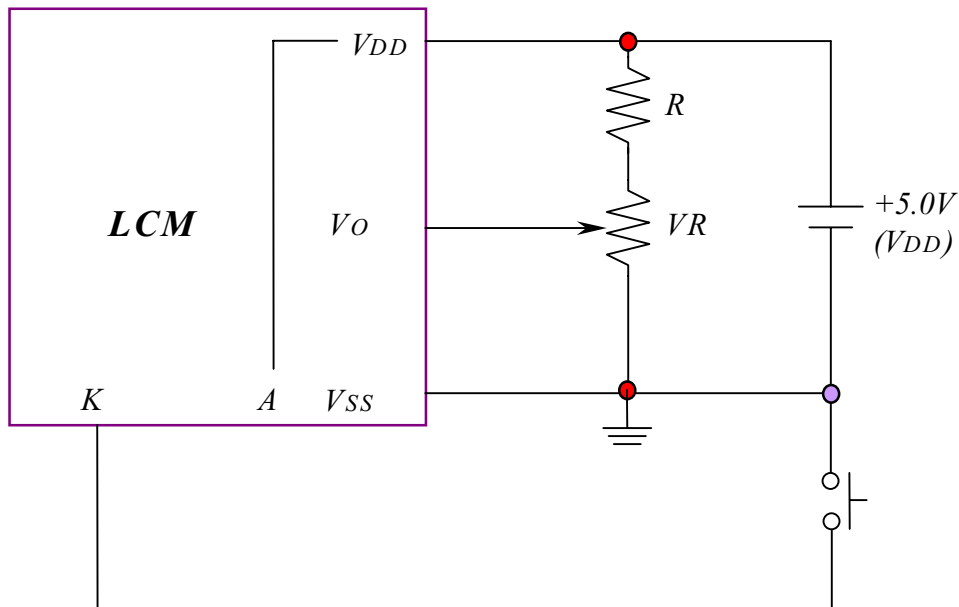
## 9 Block diagram



### Display data address charts

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE 1	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
LINE 2	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF

## 10. Power supply for LCM



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

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

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