



**EVERBOUQUET INTERNATIONAL CO., LTD.**

WE CATCH THE  
BEST TECH. FOREVER

PART NO. : MC1602M-SR

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

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

## **RECORD OF REVISION**

<b>DATE</b>	<b>PAGE</b>	<b>SUMMARY</b>

### **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-----85.0 W \* 32.6 H \* 10.0 T (Max) mm
- (3) EFFECTIVE AREA-----64.5 W \* 16.0 H mm
- (4) CHARACTER PATTERN-----5 \* 7 DOTS + CURSOR
- (5) CHARACTER SIZE -----2.96 W \* 4.86 H mm
- (6) CHARACTER PITCH-----3.55 mm
- (7) DOT SIZE -----0.56 W \* 0.66 H mm
- (8) DOT PITCH -----0.60 W \* 0.70 H mm
- (9) VIEWING DIRECTION-----6 O'CLOCK

## 5. Absolute maximum ratings

### 5.1 Electrical absolute maximum ratings

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
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)

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

ITEM	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
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  $\leq$  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<sub>a</sub> = 25°C V<sub>DD</sub> = 5.0 ± 0.25 V

<b>I T E M</b>	<b>S Y M B O L</b>	<b>C O N D I T I O N</b>	<b>M I N.</b>	<b>T Y P.</b>	<b>M A X.</b>	<b>U N I T</b>	
INPUT VOLTAGE	V <sub>IH</sub>	-----	2.2	-----	V <sub>DD</sub>	V	
	V <sub>IL</sub>		V <sub>SS</sub>	-----	0.6	V	
OUTPUT VOLTAGE (H LEVEL)	V <sub>OH</sub>	I <sub>OH</sub> = -0.2 mA	2.4	-----	-----	V	
	V <sub>OL</sub>	I <sub>OL</sub> = 1.2 mA	-----	-----	0.4	V	
POWER SUPPLY CURRENT	I <sub>DD</sub>	V <sub>DD</sub> = 5.0V	-----	1.0	1.5	mA	
RECOMMENDED LCD DRIVING VOLTAGE	V <sub>DD-VO</sub>	DUTY= 1/16 Φ= 10° θ= 0°	T <sub>a</sub> = 0°C	-----	4.9	-----	V
			T <sub>a</sub> = 25°C	-----	4.5	-----	V
			T <sub>a</sub> = 50°C	-----	4.1	-----	V

NOTE (1): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE  
ABOUT ± 0.5V BY EACH MODULE.

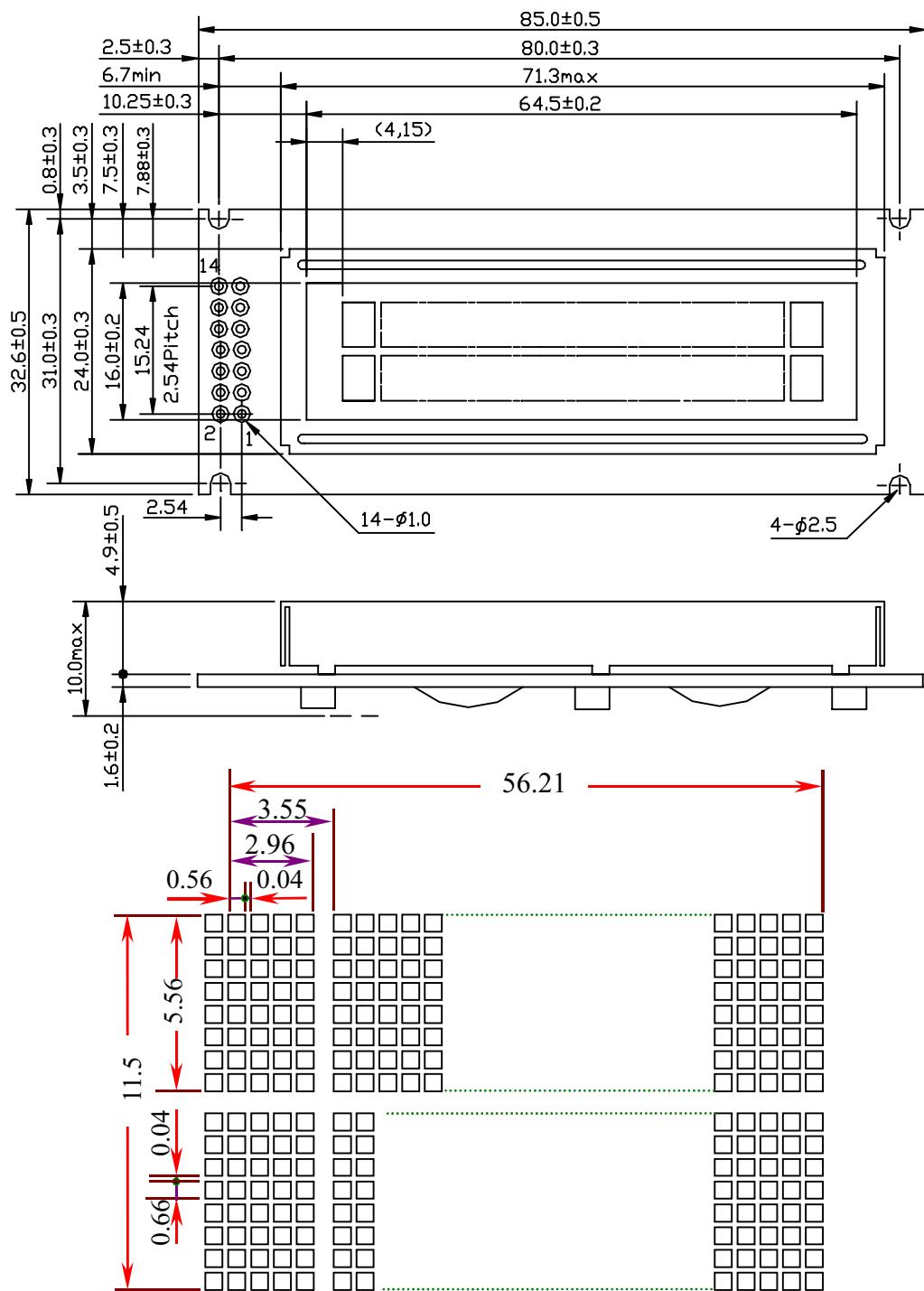
## 7. Optical characteristics

T<sub>a</sub> = 25 °C V<sub>DD</sub> = 5.0V

<b>I T E M</b>	<b>S Y M B O L</b>	<b>C O N D I T I O N</b>	<b>M I N.</b>	<b>T Y P.</b>	<b>M A X.</b>	<b>U N I T</b>	<b>N O T E</b>
VIEWING ANGLE	Φ2-Φ1	K = 2.0	30	40	-----	deg.	2
CONTRAST RATIO	K	Φ = 10° θ = 0°	3.0	4.0	-----	-----	2
RESPONSE TIME	tr (rise)	Φ = 10° θ = 0°	-----	200	350	ms	2
	tf (fall)	Φ = 10° θ = 0°	-----	300	400	ms	2

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

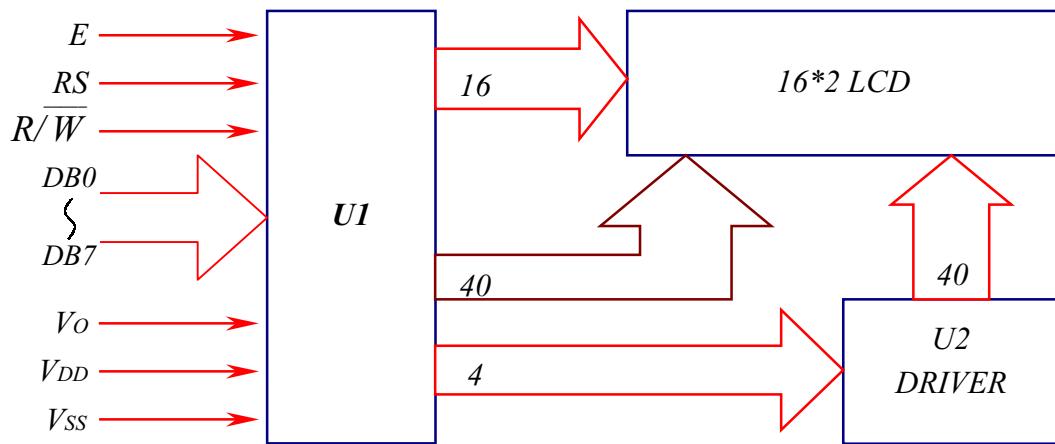
## 8. Outline dimension



## Interface pin connection

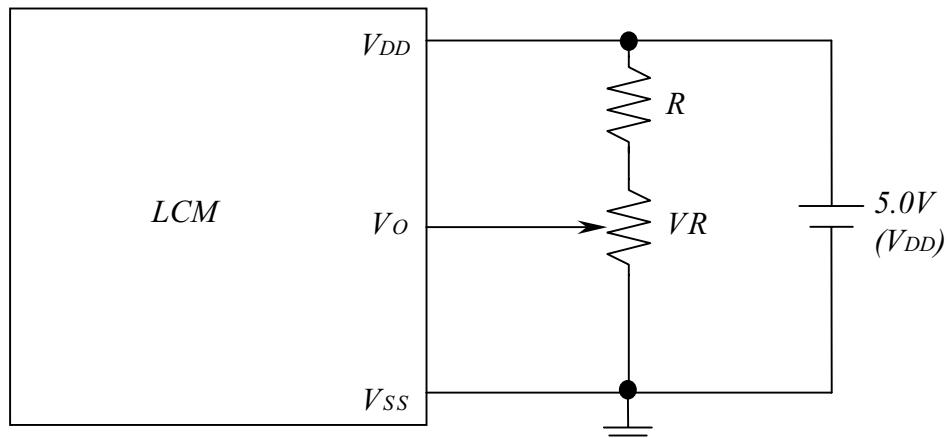
PIN NO.	1	2	3	4	5	6	7
SYMBOL	Vss	Vdd	Vo	RS	R/W	E	DB0
PIN NO.	9	8	10	11	12	13	14
SYMBOL	DB1	DB2	DB3	DB4	DB5	DB6	DB7

## 9. Block diagram



<i>Character</i>	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

## 10. Power supply for LCM



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

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

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