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PART NO. : MC1602C-SGR

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-10-12780)”.

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

### 4. Mechanical data

- (1) NUMBER OF CHARACTERS ----- 16 CH \* 2 LINE
- (2) MODULE SIZE----- 80.0 W \* 36.0 H \* 10.0 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
- (10) LCD TYPE----- STN.GRAY.REFLECTIVE

## 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	VDD-VSS	0	6.0	V	
INPUT VOLTAGE	V <sub>I</sub>	VSS	VDD	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

<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

Ta = 25 VDD = 5.0 ± 0.25 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 <sub>IH</sub>	—	2.0	—	VDD	V
	V <sub>IL</sub>		VSS	—	0.8	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> = 1.6 mA	—	—	0.4	V
POWER SUPPLY CURRENT	I <sub>DD</sub>	VDD = 5.0V	—	1.0	1.5	mA
RECOMMENDED LCD DRIVING VOLTAGE	V <sub>DD-VO</sub> DUTY= 1/16	Ta = 0	—	4.9	—	V
		Ta = 25	—	4.5	—	V
		Ta = 50	—	4.1	—	V

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

## 7. Optical characteristics

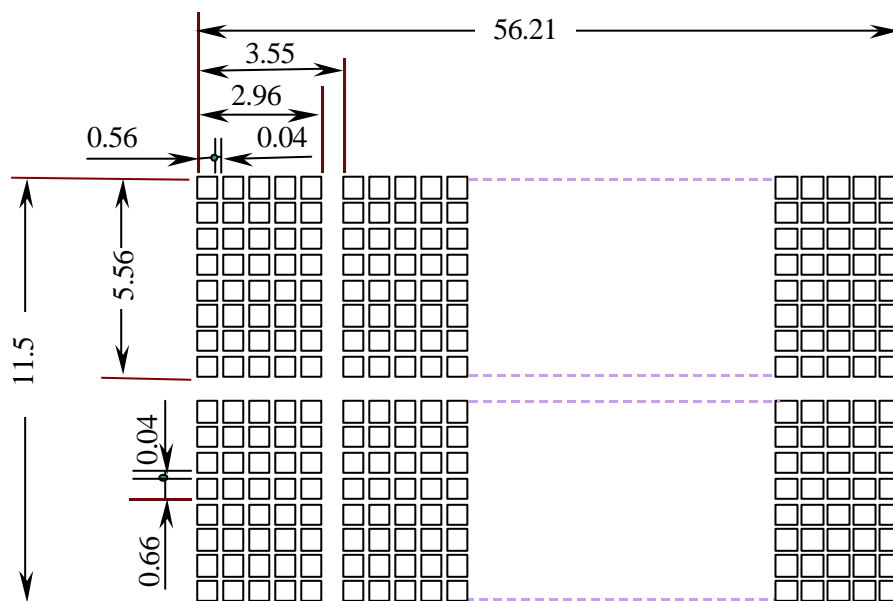
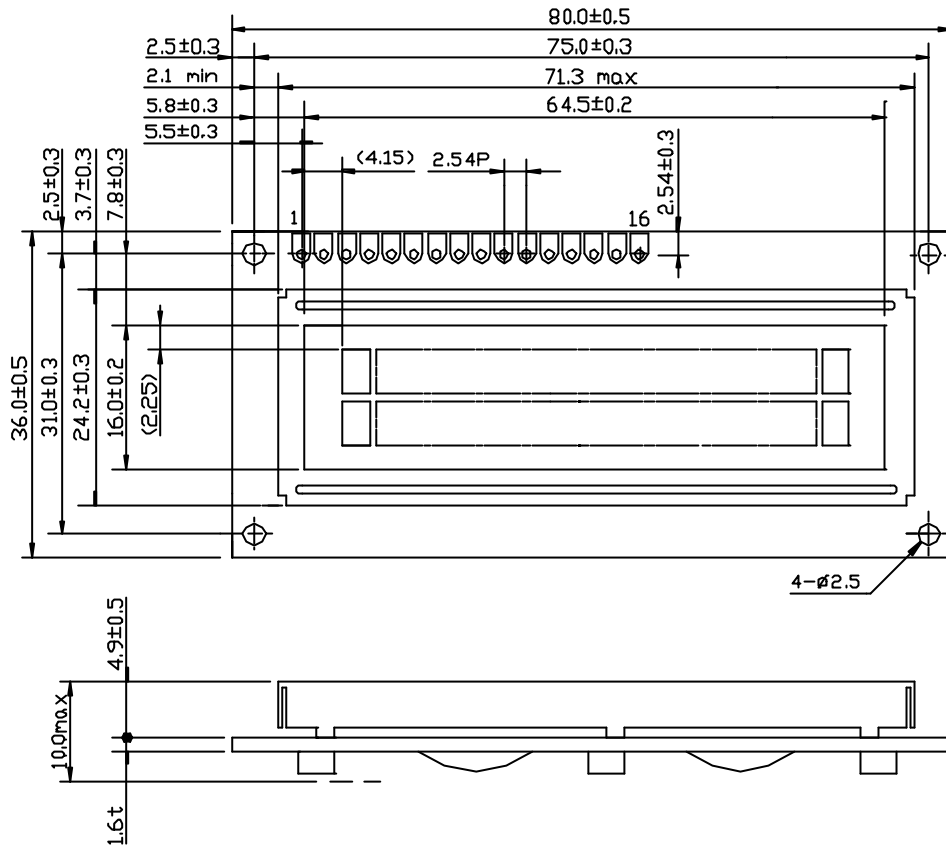
Ta = 25 VDD= 5.0V

<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	30	40	—	deg.	2
CONTRAST RATIO	K	= 10 ° = 0 °	3.0	4.0	—	—	2
RESPONSE TIME	tr (rise)	= 10 ° = 0 °	—	200	350	ms	2
	tf (fall)	= 10 ° = 0 °	—	300	400	ms	2

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

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

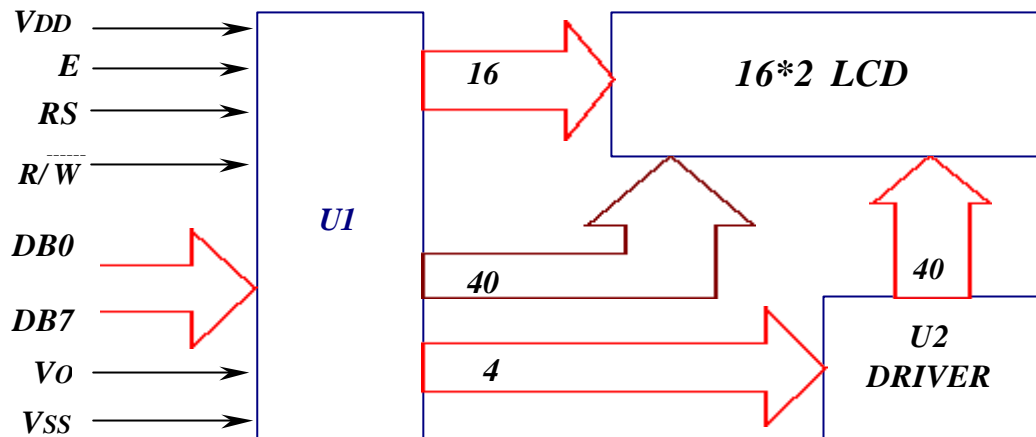
## 8. Outline dimension



### 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	VSS	VDD	Vo	RS	R/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	NC	NC

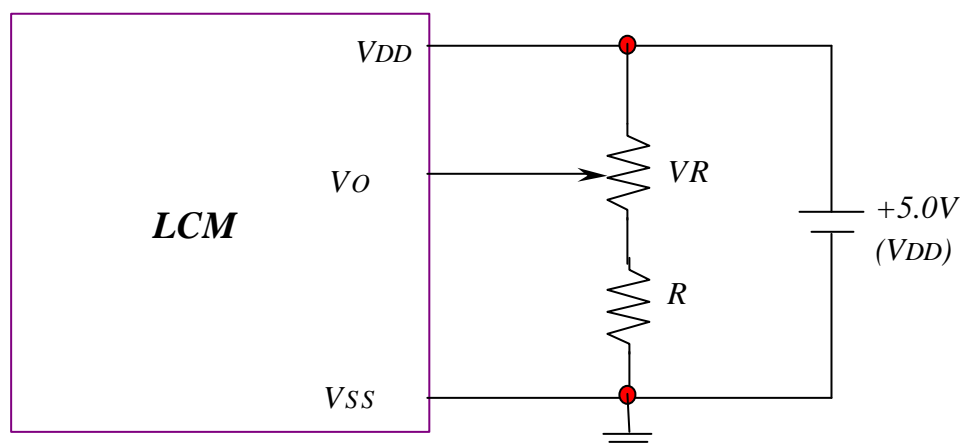
## 9. Block diagram



### Display data address charts

	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:  $V_{DD} - V_o$  1.5V

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

VR: 10K ~ 20K