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PART NO. : MC16021E8-SYL

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----- 84.0 W * 44.0 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
- (10) LCD TYPE----- STN.YELLOW-GREEN,TRANSFLECTIVE.
- (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	VDD-VSS	0	6.0	V	_____
INPUT VOLTAGE	VI	VSS	VDD	V	
STATIC ELECTRICITY	_____	_____	100	V	NOTE (1)
POWER SUPPLY FOR LED	VLED	_____	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/S²

6. Electrical characteristics

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

<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}	_____	2.0	_____	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}	$V_{DD} = 5.0\text{V}$	_____	1.0	1.5	mA
RECOMMENDED LCD DRIVING VOLTAGE	$V_{DD}-V_O$ DUTY= 1/16	$T_a = 0$	_____	4.9	_____	V
		$T_a = 25$	_____	4.5	_____	V
		$T_a = 50$	_____	4.1	_____	V
POWER SUPPLY CURRENT FOR LED	I_{LED}	$V_{LED} = 5.0\text{V}$	_____	40	60	mA

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

7. Optical characteristics

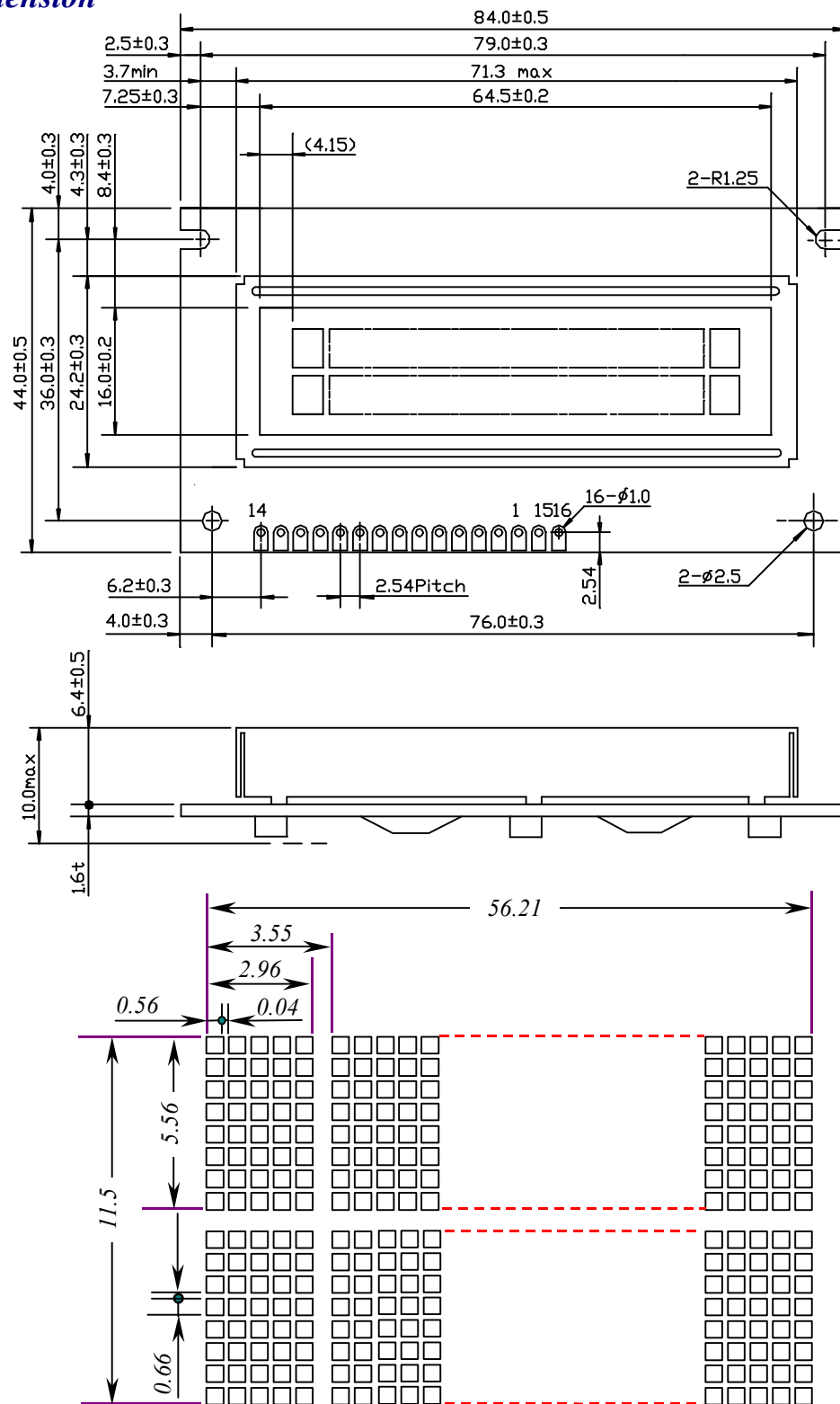
$T_a = 25$ $V_{DD} = 5.0\text{V}$

<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	$\Phi = 10^\circ$ $\theta = 0^\circ$	3	4	_____	_____	2
RESPONSE TIME	t_r (rise)	$\Phi = 10^\circ$ $\theta = 0^\circ$	_____	200	350	ms	2
	t_f (fall)	$\Phi = 10^\circ$ $\theta = 0^\circ$	_____	300	400	ms	2
BRIGHTNESS FOR LED BACKLIGHT	B	$\Phi = 0^\circ$ $\theta = 0^\circ$	4.0	_____	_____	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.

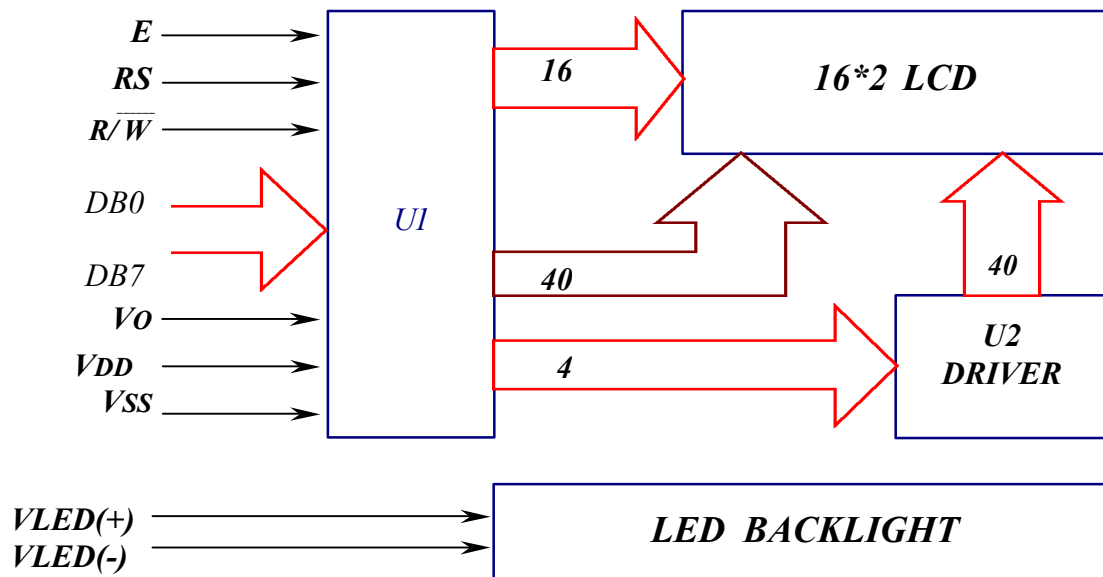
8. Outline dimension



Interface pin connection

PIN NO.	1	2	3	4	5	6	7	8
SYMBOL	VSS	VDD	VO	RS	R $\overline{W}$	E	DB0	DB1
PIN NO.	9	10	11	12	13	14	15	16
SYMBOL	DB2	DB3	DB4	DB5	DB6	DB7	VLED(+)	VLED(-)

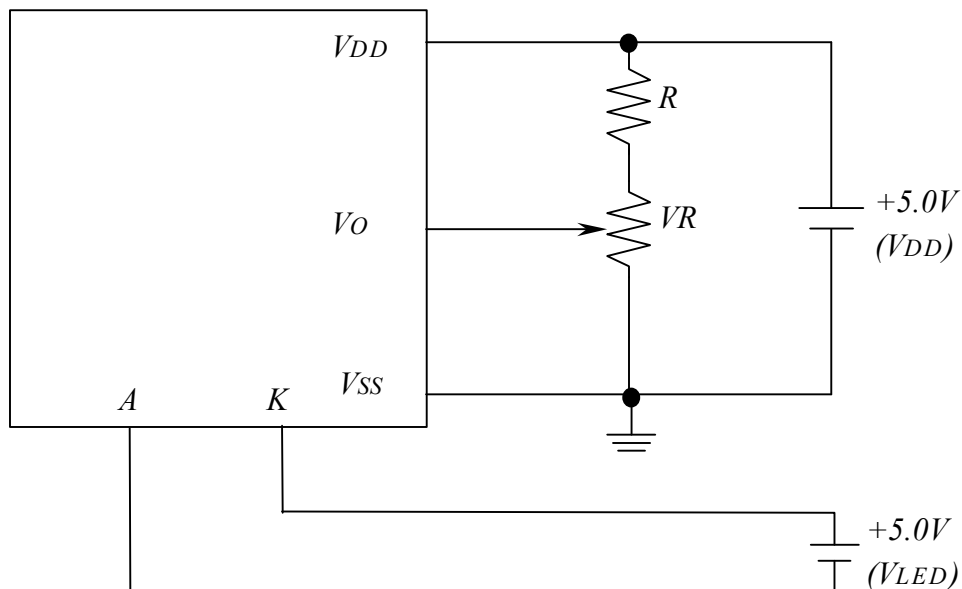
9 Block diagram



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: $V_{DD} - V_O \quad 1.5V$

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

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