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PART NO. : MC1602E-TGR

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-----TN.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 _I	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/S²

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}	_____	2.0	_____	_____	V
	V _{IL}	_____	_____	_____	0.8	V
OUTPUT VOLTAGE	V _{OH}	-I _{OH} = 0.2 mA	2.4	_____	_____	V
	V _{OL}	I _{OL} = 1.6 mA	_____	_____	0.4	V
POWER SUPPLY CURRENT	I _{DD}	V _{DD} = 5.0V	_____	1.0	1.5	mA
RECOMMENDED LCD DRIVING VOLTAGE	V _{DD-VO} DUTY= 1/16 Φ=25°	T _a = 0°C	_____	4.6	_____	V
		T _a = 25°C	_____	4.2	_____	V
		T _a = 50°C	_____	3.8	_____	V

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

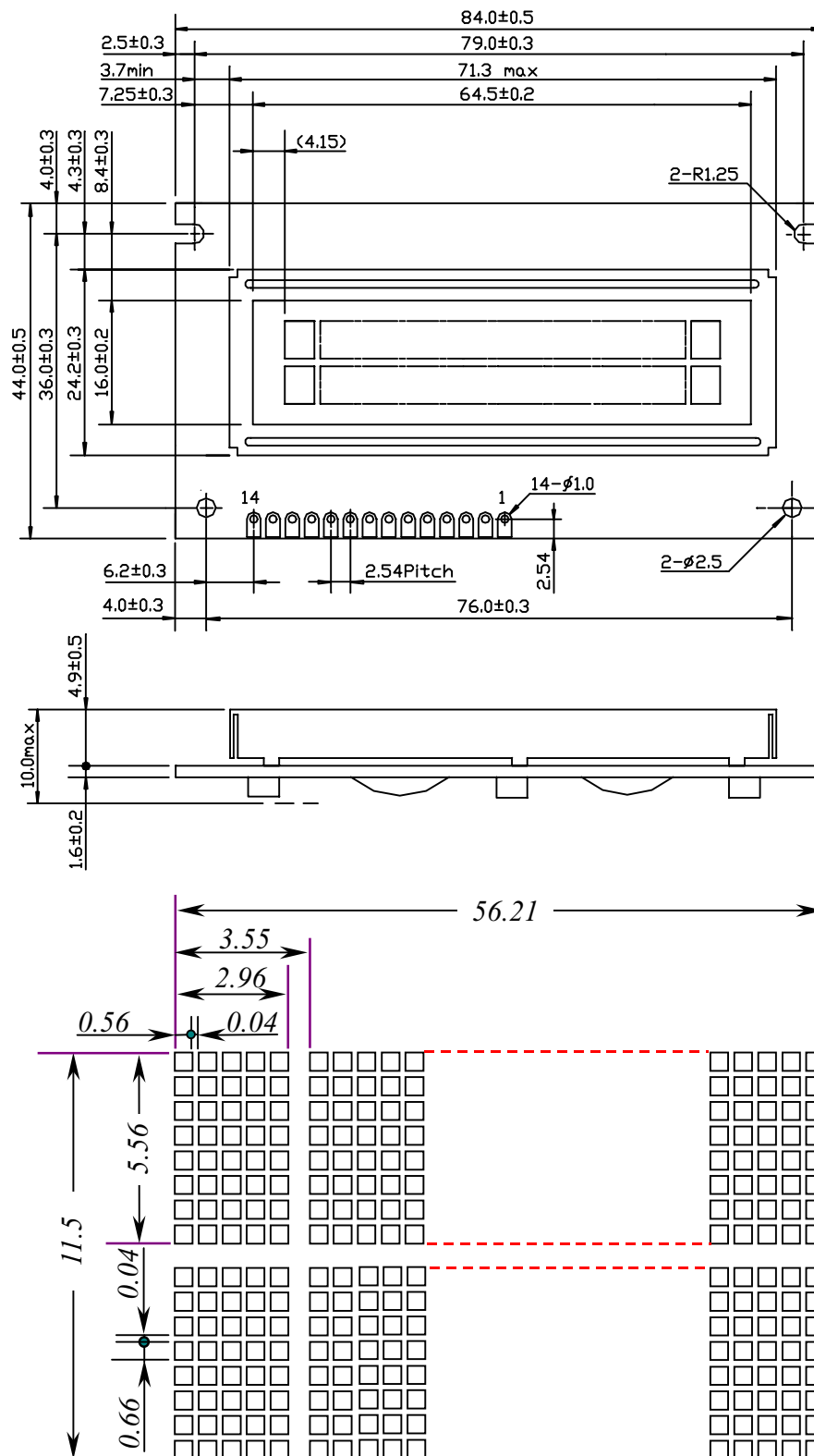
7. Optical characteristics

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

<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	Φ2-Φ1	K = 1.4	20	30	_____	deg.	2
CONTRAST RATIO	K	Φ = 25° θ = 0°	2.0	3.0	_____	_____	2
RESPONSE TIME	t _r (rise)	Φ = 25° θ = 0°	_____	150	250	ms	2
	t _f (fall)	Φ = 25° θ = 0°	_____	200	300	ms	2

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

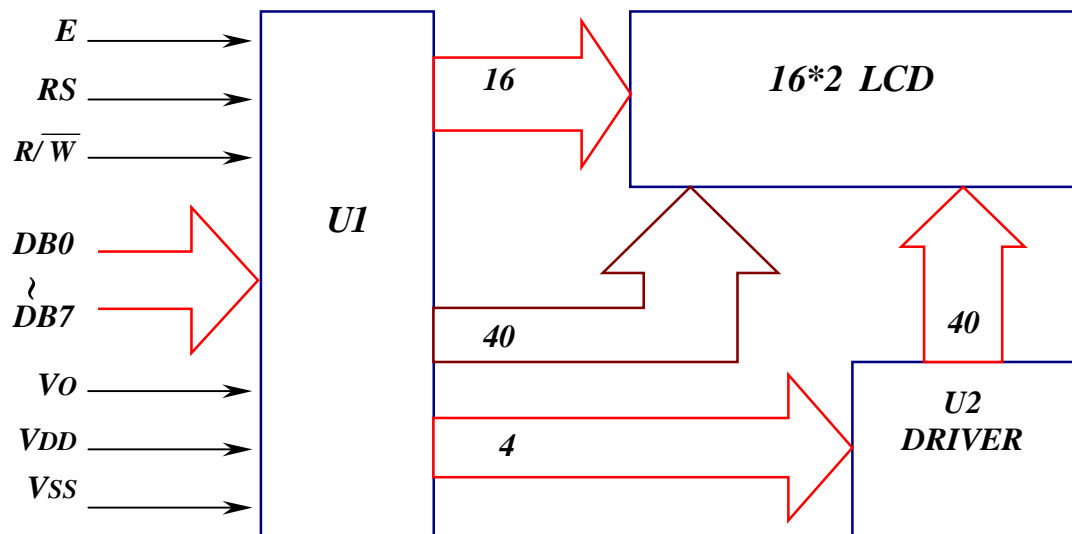
8. Outline dimension



Interface pin connection

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

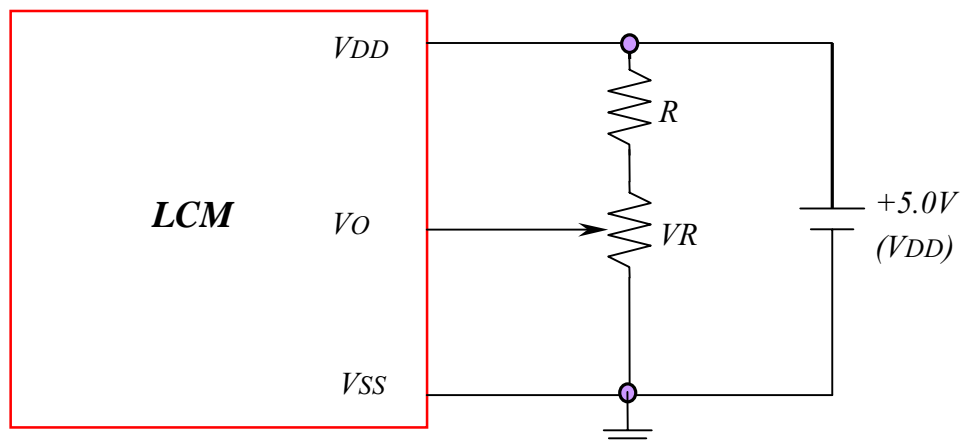
9 Block diagram



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