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EVERBOUQUET INTERNATIONAL CO., LTD.

PART NO. : MC2002E-FBLW

FOR MESSRS. : _____

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ACCEPTED BY : _____

PROPOSED BY : _____



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----- 20 CH * 2 LINE
- (2) MODULE SIZE----- 190.0 W * 54.0 H * 15.0 T (Max) mm
- (3) EFFECTIVE AREA----- 149.0 W * 31.0 H mm
- (4) CHARACTER PATTERN ----- 5 * 7 DOTS + CURSOR
- (5) CHARACTER SIZE ----- 6.0 W * 11.15 H mm
- (6) CHARACTER PITCH ----- 7.2 W * 14.25 H mm
- (7) DOT SIZE ----- 1.16 W * 1.55 H mm
- (8) DOT PITCH----- 1.21 W * 1.6 H mm
- (9) VIEWING DIRECTION----- 6 O' CLOCK
- (10) LCD TYPE----- FSTN.NEGATIVE.TRANSMISSIVE.
- (11) LED BACKLIGHT COLOR ----- WHITE

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 _{DD} -V _{SS}	0	6.0	V	-----
INPUT VOLTAGE	V _I	V _{SS}	V _{DD}	V	-----
STATIC ELECTRICITY	-----	-----	100	V	NOTE (1)
POWER SUPPLY FOR LED	V _{LED}	-----	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} = 5.060.25 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 _{IH}	-----		2.2	-----	V _{DD}	V
	V _{IL}	-----		V _{SS}	-----	0.6	V
OUTPUT VOLTAGE	V _{OH}	-I _{OH} = 0.2 mA		2.4	-----	-----	V
	V _{OL}	I _{OL} = 1.2 mA		-----	-----	0.4	V
POWER SUPPLY CURRENT	I _{DD}	V _{DD} = 5.0V		-----	2.0	3.5	mA
RECOMMENDED LCD DRIVING VOLTAGE , NOTE (1)	V _{DD} -V _O	DUTY =1/16 Φ=10 ^o θ = 0 ^o	Ta = 0	-----	5.0	-----	V
			Ta = 25	-----	4.8	-----	V
			Ta = 50	-----	4.6	-----	V
POWER SUPPLY CURRENT FOR LED	I _{LED}	V _{LED} = 4.0V		-----	60	80	mA

NOTE (1): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT 6 0.5V BY EACH MODULE.

7. Optical characteristics

T_a = 25

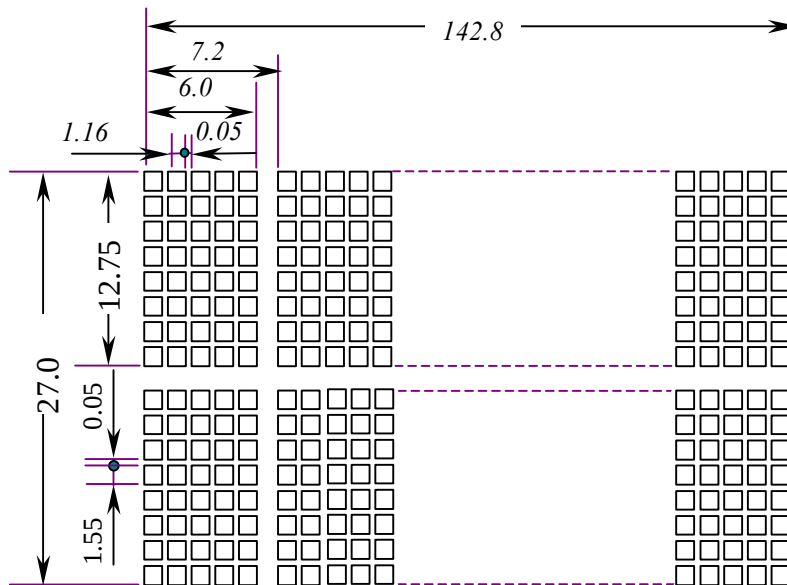
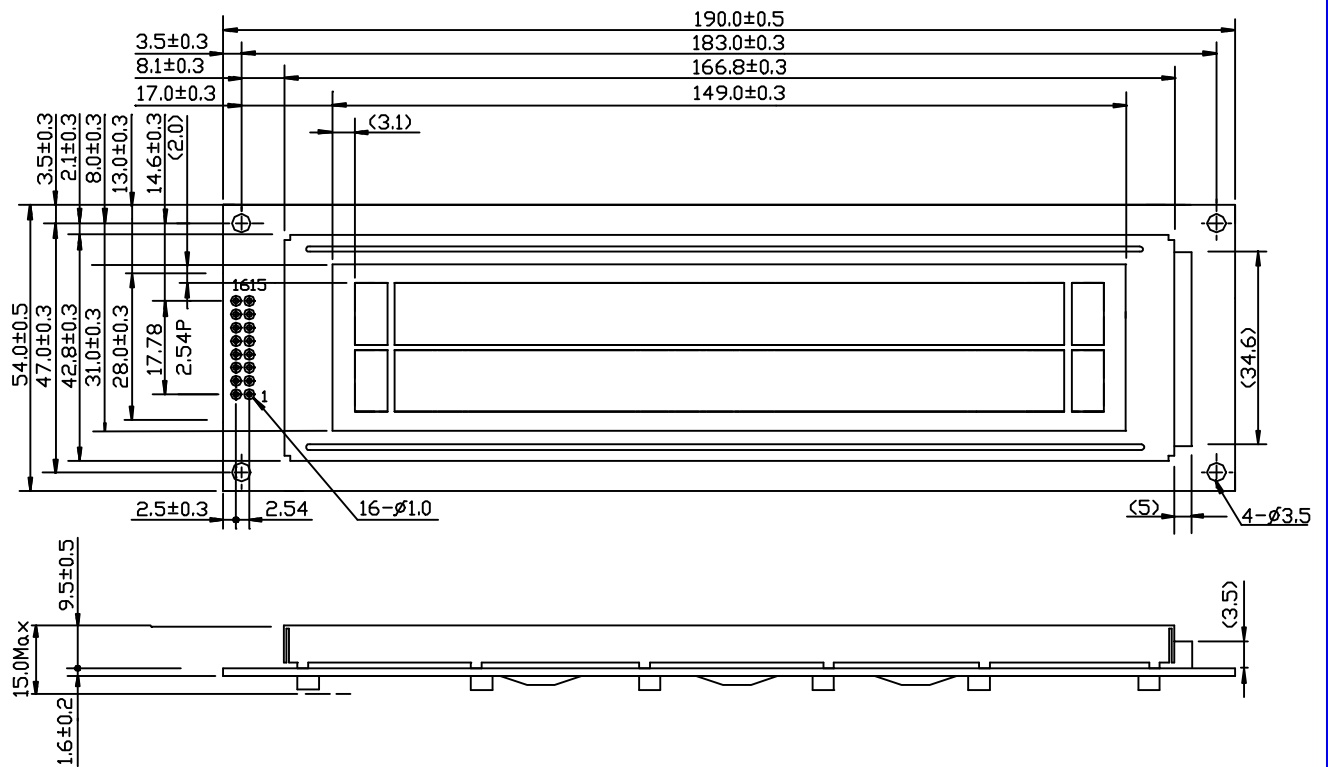
V_{DD}-V_O = 4.8V

<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 = 2.0 θ = 0°	30	40	-----	deg.	1
CONTRAST RATIO	K	Φ = 10° θ = 0°	4.0	5.0	-----	-----	1
RESPONSE TIME	t _r (rise)	Φ = 10° θ = 0°	-----	200	350	ms	1
	t _f (fall)	Φ = 10° θ = 0°	-----	300	400	ms	1
BRIGHTNESS FOR LED BACKLIGHT	B	Φ = 0° θ = 0°	6.0	-----	-----	cd/m ²	1,2

NOTE (1): SEE CUSTOMER ACCEPTANCE STANDARD SPECIFICATION FOR DEFINITION OF OPTICAL CHARACTERISTICS.

NOTE (2): UNDER NORMAL TEMPERATURE AND HUMIDITY IN A DARK ROOM.

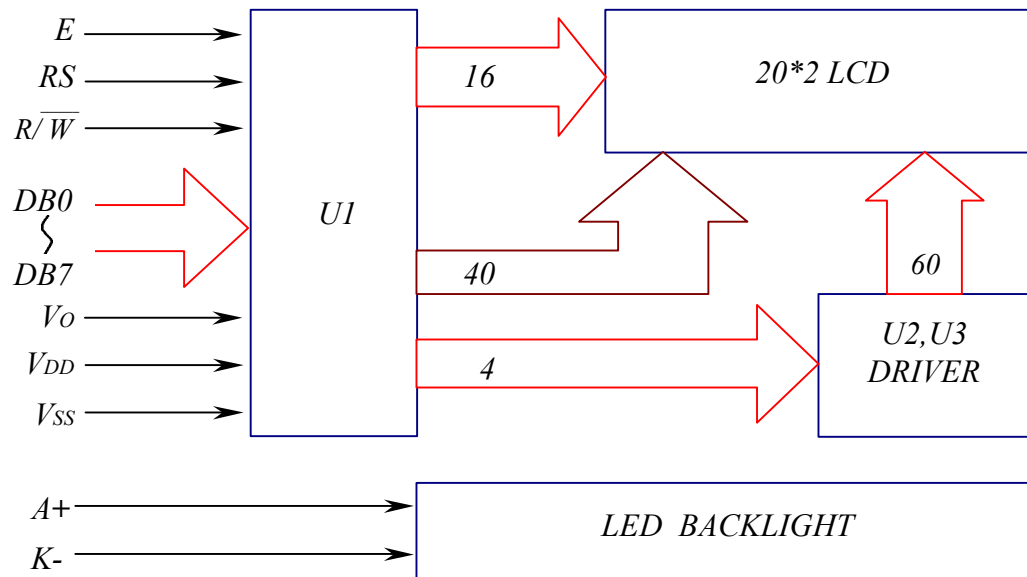
8. Outline dimension



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>	<i>8</i>
SYMBOL	V _{SS}	V _{DD}	V _O	RS	R/ $\overline{W}$	E	DB0	DB1
<i>PIN NO.</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>	<i>16</i>
SYMBOL	DB2	DB3	DB4	DB5	DB6	DB7	A(+)	K(-)

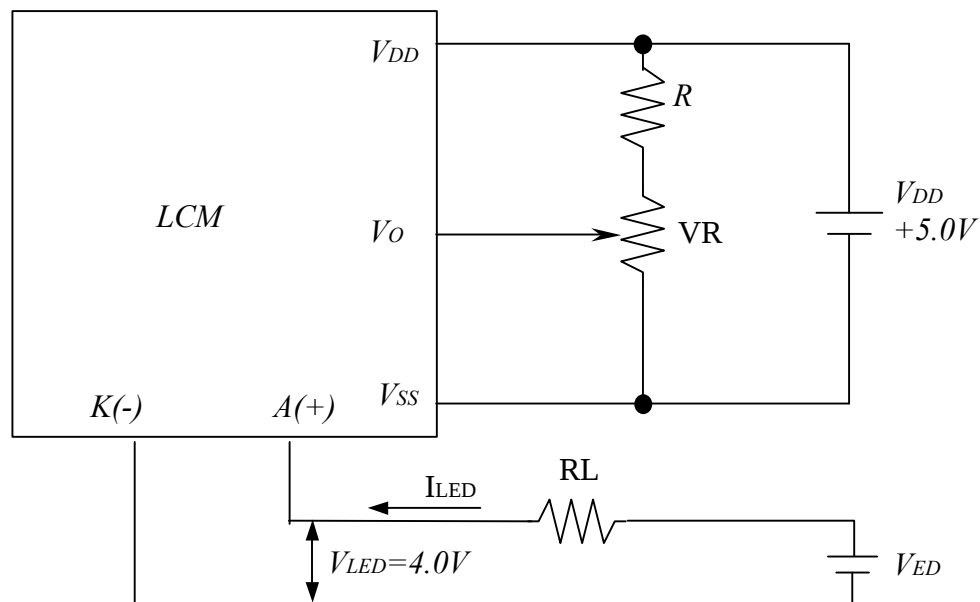
9. Block diagram



Display data address charts

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
LINE 1	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	10	11	12	13
LINE 2	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F	50	51	52	53

10. Power supply for LCM



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

$R_L \quad ((V_{ED}-4.0V) / I_{LED})$, $I_{LED} \quad 60mA$

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

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