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EVERBOUQUET INTERNATIONAL CO., LTD.

PART NO. : MC2002E-SBLW

FOR MESSRS. :

CONTENTS

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ACCEPTED BY : _____ PROPOSED BY : _____

RECORD OF REVISION

DATE	PAGE	SUMMARY
2001/02/08	6/7	ADD THE OUTLINE DIMENSION OF LIGHT GUIDE.
2002/10/03	5	Modify the Electrical characteristics (Power supply current for LED backlight)： (1) V_{LED}：5.0V → 4.0 V (2) I_{LED} (TYP.)： 80 mA → 60 mA (3) I_{LED} (MAX.)： 120 mA → 80 mA
	7	Modify the Power supply for LCM

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 * 12.75 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----------STN.BLUE/NEGATIVE.TRANSMISSIVE.

(11) LED BACKLIGHT COLOR ----------WHITE

5. Absolute maximum ratings

5.1 Electrical absolute maximum ratings

I T E M	SYMBOL	MIN.	MAX.	UNIT	COMMENT
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 T E M	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
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^2

6. Electrical characteristics

Ta = 25℃ V_{DD} = 5.0±0.25 V

ITEM	SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT
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	V_{DD}-V_O	DUTY= 1/16 Φ=10° θ=0°	Ta = 0℃	-------	4.7	-------	V
			Ta = 25℃	-------	4.5	-------	V
			Ta = 50℃	-------	4.3	-------	V
POWER SUPPLY CURRENT FOR LED BACKLIGHT	I_{LED}	V_{LED} = 4.0V ②		-------	60 ②	80 ②	mA

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

7. Optical characteristics

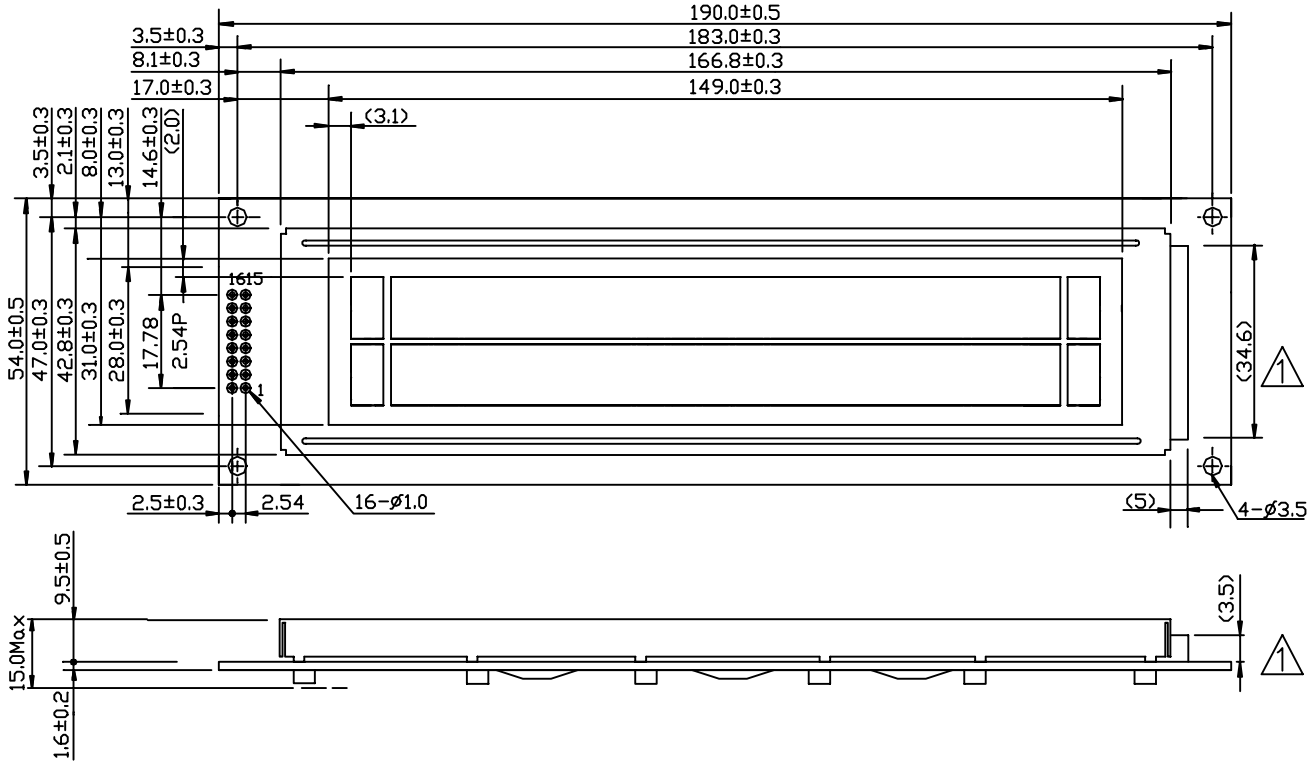
Ta = 25℃ V_{DD}-V_O = 4.5V

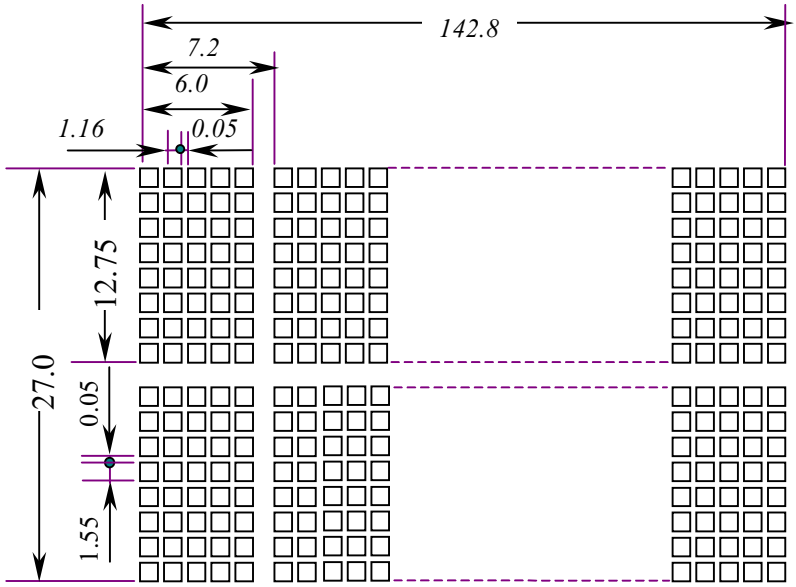
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	Φ2-Φ1	K = 2.0 θ = 0°	30	40	-------	deg.	1
CONTRAST RATIO	K	Φ = 10° θ = 0°	4.0	5.0	-------	-------	1
RESPONSE TIME	tr (rise)	Φ = 10° θ = 0°	-------	200	350	ms	1
	tf (fall)	Φ = 10° θ = 0°	-------	300	400	ms	1
BRIGHTNESS FOR LED BACKLIGHT	B	Φ = 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

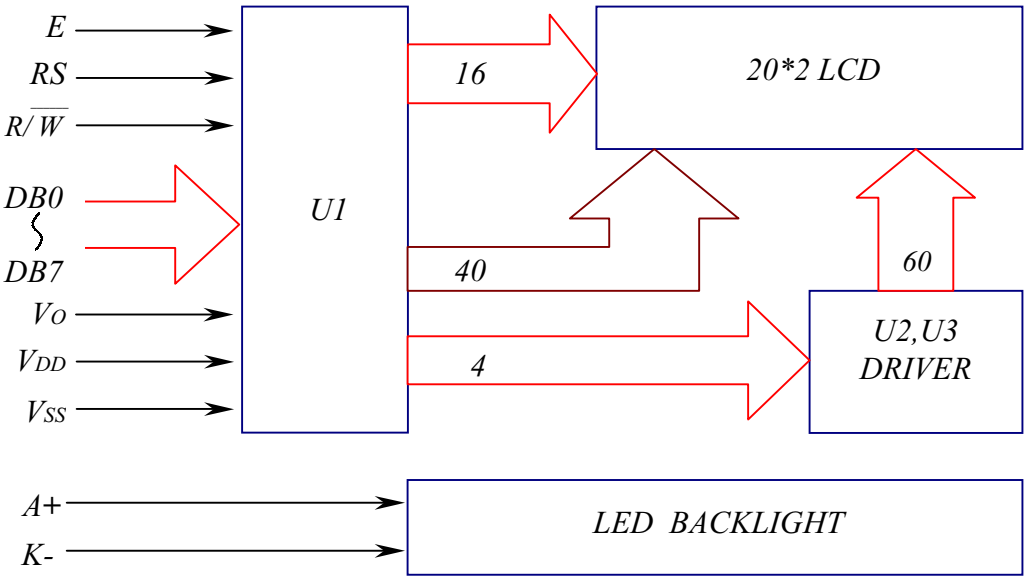




Interface pin connection

PIN NO.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
SYMBOL	V_{SS}	V_{DD}	V_O	RS	R/$\overline{W}$	E	DB0	DB1
PIN NO.	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
SYMBOL	DB2	DB3	DB4	DB5	DB6	DB7	A(+)	K(-)

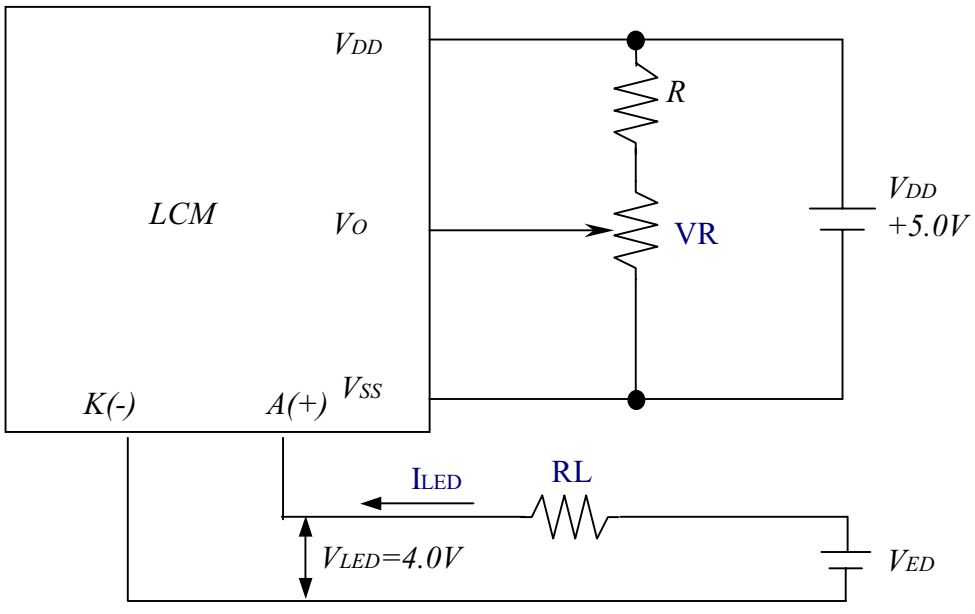
9 Block diagram



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 ⚠2



RECOMMENDED RESISTOR R: VDD – VO≧1.5V

RL≧((VED-4.0V) / ILED)，ILED≦80mA

VDD – VO: LCD DRIVING VOLTAGE

VR: 10KΩ ~ 20KΩ