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EVERBOUQUET INTERNATIONAL CO., LTD.

PART NO. : **MC16011A8-SERIES**

FOR MESSRS. :

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RECORD OF REVISION

DATE	PAGE	SUMMARY

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3. General specifications

3.1 General specifications

PLEASE REFER TO:
"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-0069)"

3.2 This individual specification is prior to general specifications

3.3 NUMBERING SYSTEM

MC16011A	B	W	**8-**	S	Y	M	L	W	U	N
	(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)

(1).CHARACTER FONTS：
PLEASE ERFER TO
"CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-0069)"

(2).LCM TEMPERATURE：
"nil" ： NORMAL TEMP
"W" ： WIDE TEMP

(3).LCD TYPE：
"T" ： TN TYPE "S" ： STN TYPE
"H" ： HTN TYPE "F" ： FSTN TYPE

(4).LCD COLOR：
"Y" ： YELLOW-GREEN "B" ： BLUE(STN/NEGATIVE)/BLACK(FSTN/NEGATIVE)
"G" ： GRAY "W" ： WHITE(FSTN/POSITIVE)

(5).LCD POLARIZE TYPE
"nil" ： TRANSFLECTIVE
"M" ： TRANSMISSIVE

(6).BACKLIGHT TYPE：
"L" ： LED BACKLIGHT

(7).BACKLIGHT COLOR：
LED TYPE：
"nil" ： YELLOW-GREEN "A" ： AMBER "B" ： BLUE
"G" ： PURE GREEN "O" ： ORANGE "R" ： RED
"W" ： WHITE

(8). VIEWING DIRECTION：
"nil" ： 6 O'CLOCK "3" ： 3 O'CLOCK
"U" ： 12 O'CLOCK "9" ： 9 O'CLOCK

(9).BACKLIGHT TYPE：
"nil" ： LED(+),LED(-)---NORMAL
"N" ： LED(+),LED(-)---CHANGE

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4. Mechanical data

(1) NUMBER OF CHARACTER ---------- 16 CH * 1 LINE

(2) MODULE SIZE ----------80.0 W * 36.0 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---------- 3.07 W *5.73 H mm

(6) CHARACTER PITCH ----------3.77 mm

(7) DOTS SIZE----------0.55 W * 0.75 H mm

(8) DOTS PITCH----------0.63 W * 0.83 H mm

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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}	------	NOTE(2)	V	------

NOTE (1): ELECTRO-STATIC DISCHARGE RESISTANCE IS TESTED BY CHARGING A 200PF CAPACITOR AND DISCHARGING IT BY CONTACT WITH A INTERFACE CONNECTOR PIN.

NOTE (2):

SYMBOL	V_{LED} MAX.	LED TYPE
V_{LED}	5.5V	YELLOW-GREEN,AMBER,ORANGE,RED
	5.0V	BLUE,PURE GREEN,WHITE

5.2 Environmental absolute maximum ratings

I T E M	CONDITION	OPERATING		STORAGE		COMMENT
		MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	NORMAL	0℃	50℃	-20℃	70℃	------
	WIDE	-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

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6. Electrical characteristics

$Ta = 25^{\circ}C$ $V_{DD} = 5.0 \pm 0.25$ V

ITEM	SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT
INPUT VOLTAGE	V_{IH}	----------		2.2	------	------	V
	V_{IL}			------	------	0.6	V
OUTPUT VOLTAGE	V_{OH}	$-I_{OH}$ =0.205 mA		2.4	------	------	V
	V_{OL}	I_{OL} = 1.2 mA		------	------	0.4	V
POWER SUPPLY CURRENT	I_{DD}	V_{DD} = 5.0V		------	1.0	1.5	mA
RECOMMENDED LCD DRIVING VOLTAGE, NOTE(1)	V_{DD}-V_O	STN/ FSTN DUTY =1/16 Φ=10° NOTE(2)	Ta=-20°C	------	4.8	------	V
			Ta= 0°C	------	4.7	------	V
			Ta= 25°C	------	4.5	------	V
			Ta= 50°C	------	4.3	------	V
			Ta= 70°C	------	4.2	------	V
		TN DUTY =1/16 Φ=25° NOTE(2)	Ta=-20°C	------	4.7	------	V
			Ta= 0°C	------	4.6	------	V
			Ta= 25°C	------	4.2	------	V
			Ta= 50°C	------	3.8	------	V
			Ta= 70°C	------	3.7	------	V
POWER SUPPLY CURRENT FOR NOTE(3)	I_{LED}	V_{LED} NOTE(3)		------	30	40	mA

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

(2): θ = 0° : VIEWING ANGLE AT 6 O'CLOCK

θ = 180° : VIEWING ANGLE AT 12 O'CLOCK

(3): LED CURRENT OF DIFFERENT LED TYPE

LED B.L TYPE	V_{LED}	I_{LED}				LED COLOR
		MIN.	TYP.	MAX.	UNIT.	
A	4.8V	-----	30	40	mA	YELLOW-GREEN、AMBER、ORANGE、RED
B	4.0V	-----	30	40	mA	BLUE、WHITE、PURE GREEN

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7. Optical characteristics

TN TYPE LCD

$Ta = 25℃$ $V_{DD}-V_O = 4.2V$

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	Φ2-Φ1	K = 1.4 NOTE(1)	20	30	----	deg.	NOTE(2)
CONTRAST RATIO	K	Φ = 25° NOTE(1)	2.0	3.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	Φ = 25° NOTE(1)	----	150	250	ms	NOTE(2)
	tf (fall)	Φ = 25° NOTE(1)	----	150	250	ms	NOTE(2)

STN TYPE LCD

$Ta = 25℃$ $V_{DD}-V_O = 4.5V$

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	Φ2-Φ1	K = 2.0 NOTE(1)	30	40	----	deg.	NOTE(2)
CONTRAST RATIO	K	Φ = 10° NOTE(1)	3.0	4.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	Φ = 10° NOTE(1)	----	200	350	ms	NOTE(2)
	tf (fall)	Φ = 10° NOTE(1)	----	300	400	ms	NOTE(2)

FSTN /STN BLUE TYPE LCD

$Ta = 25℃$ $V_{DD}-V_O = 4.5V$

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING ANGLE	Φ2-Φ1	K = 2.0 NOTE(1)	30	40	----	deg.	NOTE(2)
CONTRAST RATIO	K	Φ = 10° NOTE(1)	4.0	5.0	----	----	NOTE(2)
RESPONSE TIME	tr (rise)	Φ = 10° NOTE(1)	----	200	350	ms	NOTE(2)
	tf (fall)	Φ = 10° NOTE(1)	----	300	400	ms	NOTE(2)

Brightness for LED backlight

SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	LED TYPE	NOTE
B	Φ = 0° θ = 0°	4.0	----	----	cd/m^2	YELLOW-GREEN、RED、AMBER、ORANGE	NOTE(2)
		6.0	----	----		BLUE、PURE GREEN、WHITE	NOTE(3)

NOTE (1): θ = 0° WHEN VIEWING ANGLE AT 6 O'CLOCK
θ = 180° WHEN VIEWING ANGLE AT 12 O'CLOCK

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

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

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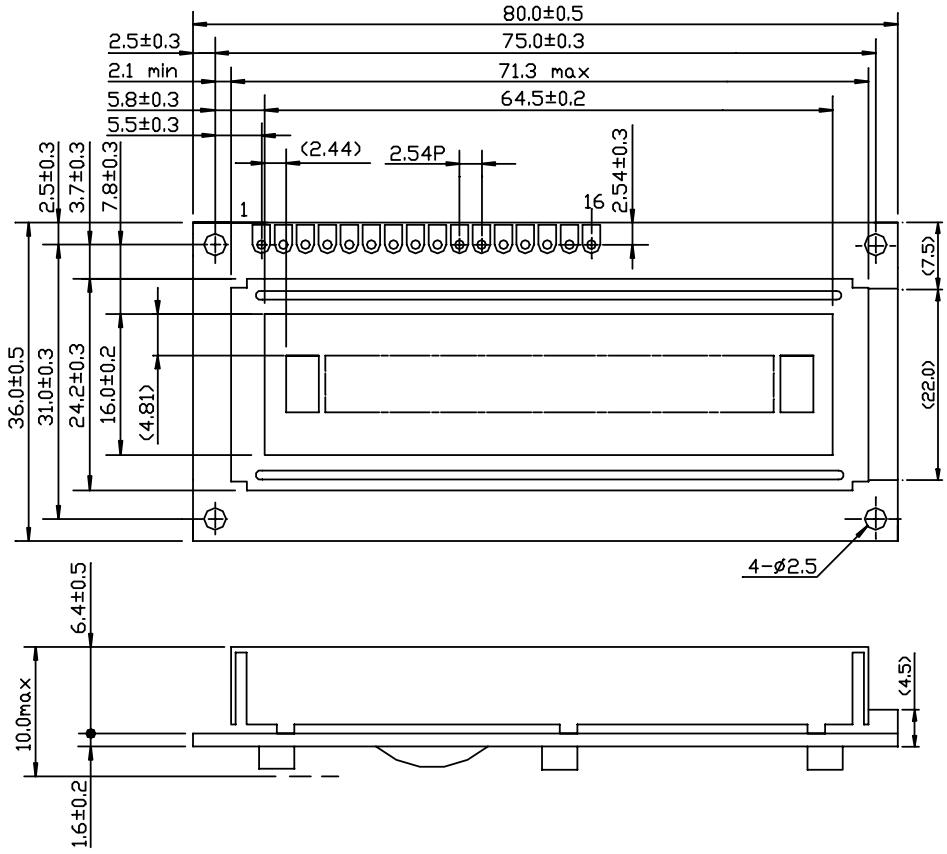
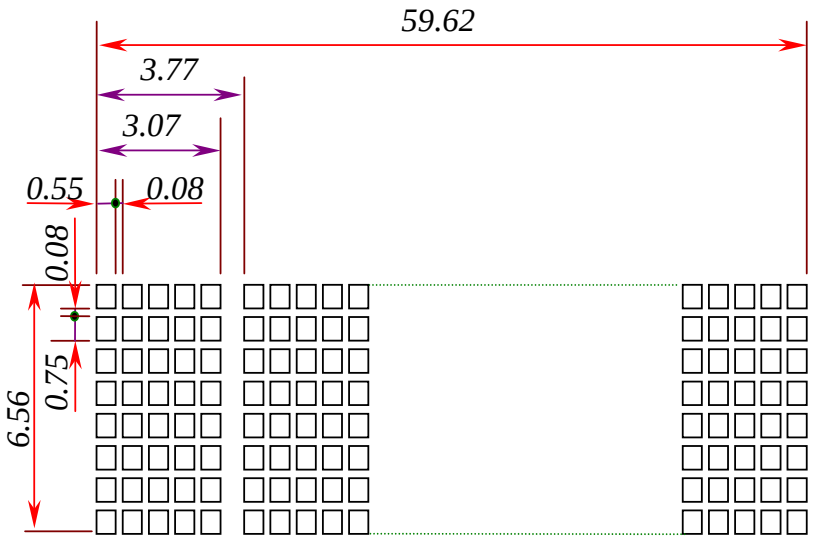
8. Outline dimension





NOTE :
1.UNIT : mm
2.SCALE : NTS

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(-)

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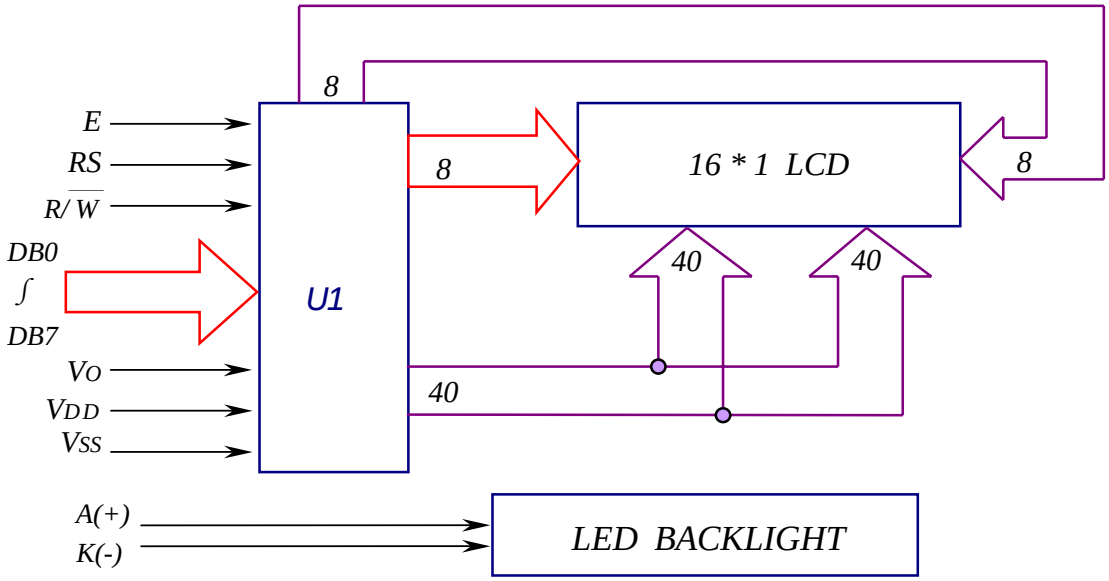
9. Block diagram



Display data address charts

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE 1	00	01	02	03	04	05	06	07	40	41	42	43	44	45	46	47

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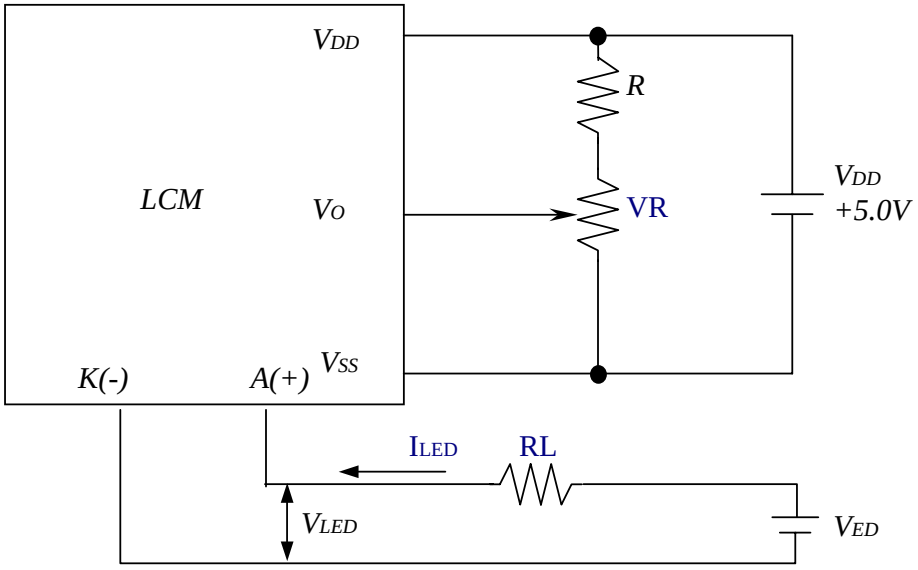
10. Power supply for LCM



RECOMMENDED RESISTOR R : V_{DD}–V_O≧1.5V

V_{DD}–V_O: LCD DRIVING VOLTAGE

VR: 10KΩ~20KΩ

ITEM	*LED TYPE*	*CONDITION*
Limit resister of LED **(RL)**	**A**	RL≧((V_{ED}-4.8V) / I_{LED}), I_{LED}≦40mA
	B	RL≧((V_{ED}-4.0V) / I_{LED}), I_{LED}≦40mA

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