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EVERBOUQUET INTERNATIONAL CO., LTD.

PART NO. : MG12064E3-SERIES

FOR MESSRS. :

CONTENTS

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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-10-61202)".

3.2 This individual specification is prior to general specifications

3.3 NUMBERING SYSTEM

MG12064E3	-	S	Y	M	L	W	U
		(1)	(2)	(3)	(4)	(5)	(6)

(1).LCD TYPE：
"S" ： STN TYPE
"F" ： FSTN TYPE

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

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

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

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

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

4. Mechanical data

(1) NUMBER OF DOTS ---------- 128 CH * 64 DOTS

(2) MODULE SIZE ---------- 63.2 W * 54.0 H * 9.5 T (max) mm

(3) EFFECTIVE AREA ---------- 54.0 W * 36.0 H mm

(4) ACTIVE AREA ---------- 49.88 W * 31.32 H

(5) DOT SIZE ---------- 0.35 W * 0.45 H mm

(6) DOT PITCH ---------- 0.39 W *0.49 H mm

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	WHITE, BLUE, PURE-GREEN

5.2 Environmental absolute maximum ratings

I T E M	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	-20℃	70℃	-20℃	70℃	------
HUMIDITY	NOTE (3)		NOTE (3)		NO CONDENSATION
VIBRATION NOTE (4)	------	0.5G	------	2G	10 300HZ XYZ DIRECTIONS 1 Hr EACH
SHOCK NOTE (4)	------	3G	------	50G	10 msec XYZ DIRECTIONS 1 TIME EACH
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		------

NOTE (3): 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 (4): 1G = 9.8 m/s^2

6. Electrical characteristics

Ta = 25℃ V_{DD} = 5.0 ±0.25 V

I T E M	*SYMBOL*	*CONDITION*		*MIN.*	*TYP.*	*MAX.*	*UNIT*
POWER SUPPLY VOLTAGE FOR CIRCUIT	V_{DD}-V_{SS}	-------		4.75	5.0	5.25	V
INPUT VOLTAGE NOTE (2)	V_{IH}	H LEVEL		0.7V_{DD}	-------	V_{DD}	V
	V_{IL}	L LEVEL		V_{SS}	-------	0.3V_{DD}	V
OUTPUT VOLTAGE NOTE (1)	V_{OH}	I_{OH} = -0.4 mA		V_{DD}-0.4	-------	-------	V
	V_{OL}	I_{OL} = 0.4 mA		-------	-------	0.4	V
POWER SUPPLY CURRENT, NOTE (3)	I_{DD}	V_{DD}-V_{SS} = 5.0V		-------	5.0	8.0	mA
RECOMMENDED LCD DRIVING VOLTAGE, NOTE(4)	V_{DD}-V_O	STN/ FSTN DUTY =1/64 Φ=10° NOTE(5)	Ta=-20°C	------	9.3	------	V
			Ta= 25°C	------	8.9	------	V
			Ta= 70°C	------	8.5	------	V
POWER SUPPLY CURRENT FOR LED	I_{LED}	NOTE(6)		-------	NOTE(6)	NOTE(6)	mA

NOTE(1): APPLIED TO TERMINALS DB0~DB7

(2): APPLIED TO TERMINALS D/$\overline{I}$, R/$\overline{W}$, E, DB0~DB7, CS1, CS2, $\overline{RST}$

(3): THE DISPLAY PATTERN IS ALL “ON”, OR ALL “OFF”

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

(5): θ = 0° ：VIEWING DIRECTION AT 6 O’CLOCK

θ = 180°：VIEWING DIRECTION AT 12 O’CLOCK

(6): LED CURRENT FOR DIFFERENT LED BACKLIGHT TYPE

LED B.L TYPE	*CONDITION*	*I_{LED}*				*LED COLOR*
		MIN.	*TYP.*	*MAX.*	*UNIT.*	
A	V_{LED} =4.8V	-----	75	100	mA	YELLOW-GREEN、AMBER、ORANGE、RED
B	V_{LED} =4.0V	-----	150	200	mA	BLUE、WHITE、PURE-GREEN

7. Optical characteristics

STN TYPE LCD

$Ta = 25℃$ $V_{DD}-V_O = 8.9V$

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

$Ta = 25℃$ $V_{DD}-V_O = 8.9V$

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	NOTE
B	Φ = 0° θ = 0°	5.0	----	----	cd/m^2	NOTE(2) NOTE(3)

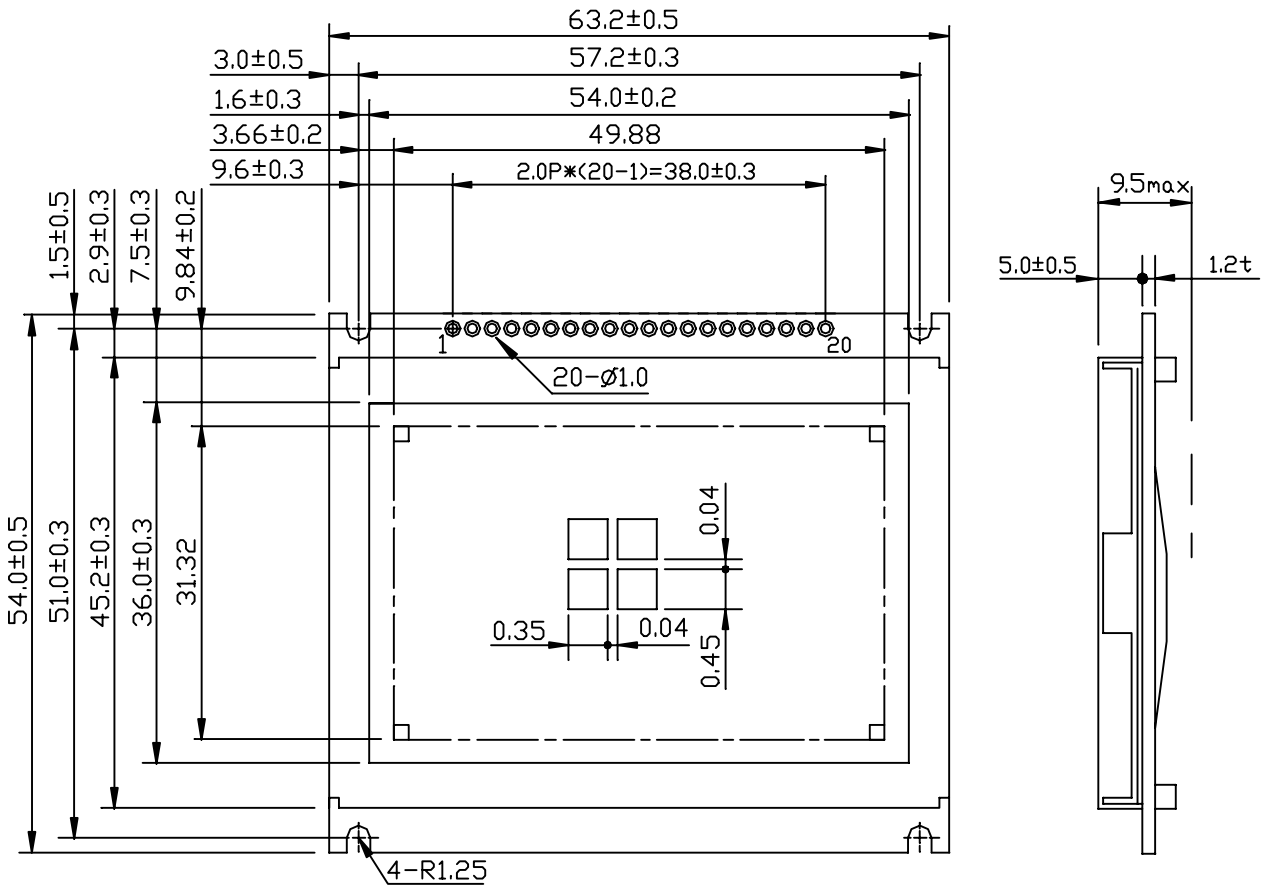
NOTE (1): θ = 0° : VIEWING DIRECTION AT 6 O'CLOCK

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

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



NOTE :

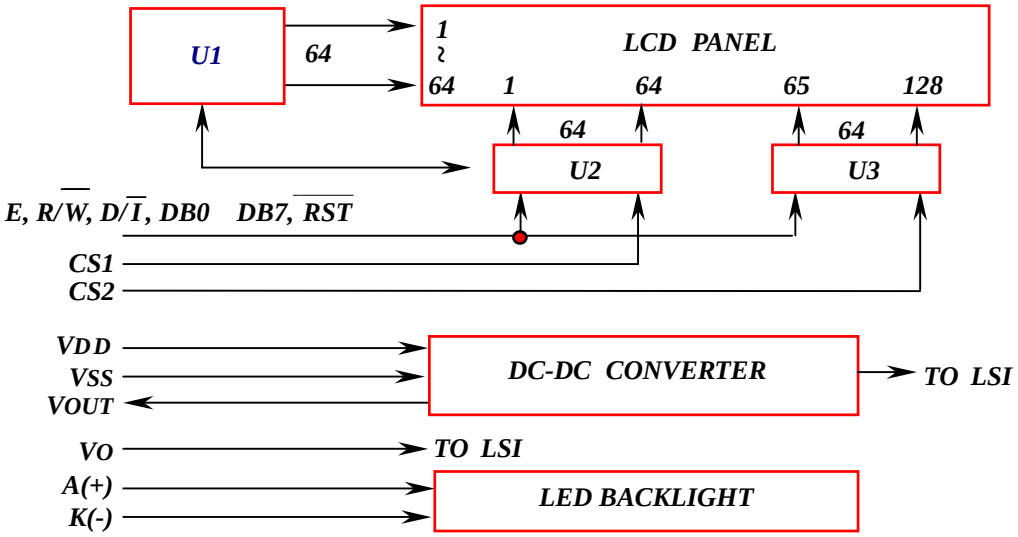
1.UNIT : mm

2.SCALE : NTS

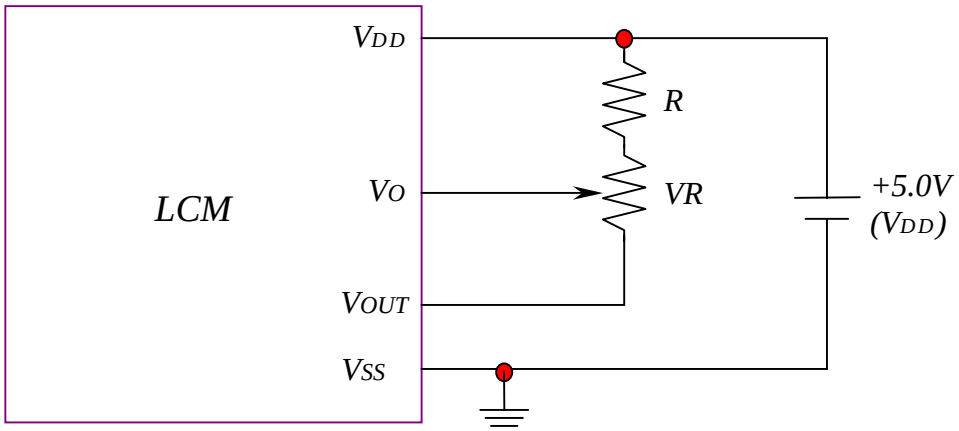
Interface pin connection

PIN NO.	SYMBOL	FUNCTION
1	V_{SS}	GROUND
2	V_{DD}	POWER SUPPLY FOR LOGIC
3	V_O	OPERATING VOLTAGE FOR LCD DRIVING
4	D/$\overline{I}$	H: DATA INPUT L: INSTRUCTION CODE INPUT
5	R/$\overline{W}$	H: DATA READ (LCD MODULE → MPU) L: DATA WRITE (LCD MODULE ← MPU)
6	E	ENABLE SIGNAL
7	DB0	DATA INPUT/OUTPUT (LSB)
8	DB1	DATA INPUT/OUTPUT
9	DB2	DATA INPUT/OUTPUT
10	DB3	DATA INPUT/OUTPUT
11	DB4	DATA INPUT/OUTPUT
12	DB5	DATA INPUT/OUTPUT
13	DB6	DATA INPUT/OUTPUT
14	DB7	DATA INPUT/OUTPUT (MSB)
15	CS1	H: CHIP SELECTION FOR IC1
16	CS2	H: CHIP SELECTION FOR IC2
17	$\overline{RST}$	L: RESET
18	V_{OUT}	POWER SUPPLY FOR LCD DRIVING
19	A(+)	POWER SUPPLY FOR LED (+)
20	K(-)	POWER SUPPLY FOR LED (-)

9. Block diagram



10. Power supply for LCM

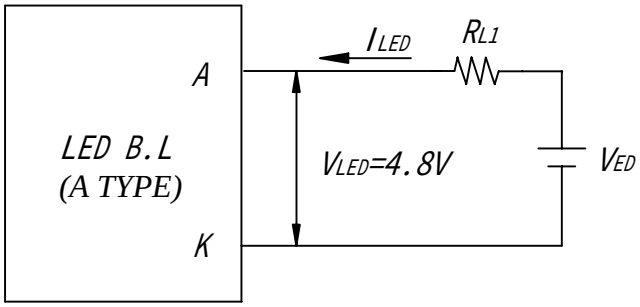


RECOMMENDED RESISTOR R: $V_{DD} - V_O \geqq 1.5V$

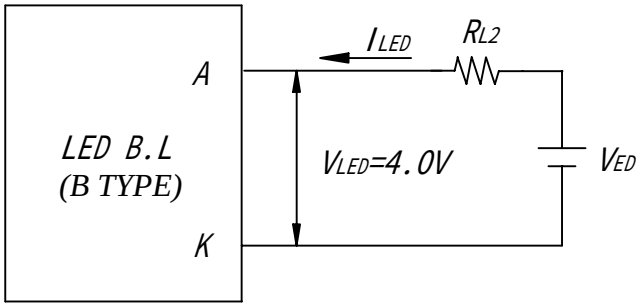
$V_{DD} - V_O$: LCD DRIVING VOLTAGE

VR: 10KΩ~20KΩ

10.1 Power supply for backlight



RL1≧(VED-VLED) / ILED , RL1≧1W , ILED≦100.0 mA (max)



RL2≧(VED-VLED) / ILED , RL2≧1W , ILED≦200.0 mA (max)