



# ***PALM TECHNOLOGY CO., LTD.***

***The LCD(M) Specialist***

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PART NO. : PMG12064E-SYL

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-10-61210)”.

#### **3.2 This individual specification is prior to general specifications**

### **4. Mechanical data**

- (1) NUMBER OF DOTS ----- 128 CH \* 64 DOTS
- (2) MODULE SIZE ----- 63.2 W \* 54.0 H \* 10.5 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
- (9) VIEWING DIRECTION ----- 6 O’CLOCK
- (10) LCD TYPE ----- STN.YELLOW-GREEN.TRANSFLECTIVE.
- (11) LED COLOR ----- YELLOW-GREEN

## 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 <sub>DD</sub> -V <sub>SS</sub>	0	6.0	V	-----
INPUT VOLTAGE	V <sub>I</sub>	V <sub>SS</sub>	V <sub>DD</sub>	V	-----
STATIC ELECTRICITY	-----	-----	100	V	NOTE (1)
POWER SUPPLY FOR LED	V <sub>LED</sub>	-----	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	-20°C	70°C	-20°C	70°C	-----
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°C: 90% RH MAX.

Ta ≥ 50°C: ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY  
OF 90% RH AT 50°C. (80% RH AT 60°C)

NOTE (3): 1G = 9.8 m/s<sup>2</sup>

## 6. Electrical characteristics

Ta = 25°C VDD = 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>	
POWER SUPPLY VOLTAGE FOR CIRCUIT	VDD-VSS	-----	4.75	5.0	5.25	V	
INPUT VOLTAGE NOTE (2)	V <sub>IH</sub>	H LEVEL	0.7V <sub>DD</sub>	-----	V <sub>DD</sub>	V	
	V <sub>IL</sub>	L LEVEL	V <sub>SS</sub>	-----	0.3V <sub>DD</sub>	V	
OUTPUT VOLTAGE NOTE (1)	V <sub>OH</sub>	I <sub>OH</sub> = -0.4 mA	V <sub>DD</sub> -0.4	-----	-----	V	
	V <sub>OL</sub>	I <sub>OL</sub> = 0.4 mA	-----	-----	0.4	V	
POWER SUPPLY CURRENT, NOTE (3)	I <sub>DD</sub>	V <sub>DD</sub> -V <sub>SS</sub> = 5.0V	-----	5.0	8.0	mA	
LCD DISPLAY DUTY RATIO	DUTY	-----	-----	1/64	-----	-----	
RECOMMENDED LCD DRIVING VOLTAGE, NOTE (4)	V <sub>DD</sub> -V <sub>O</sub>	Φ = 10° θ = 0°	Ta = 70°C	-----	8.1	-----	V
			Ta = 25°C	-----	8.5	-----	V
			Ta = -20°C	-----	8.9	-----	V
POWER SUPPLY CURRENT FOR LED	I <sub>LED</sub>	V <sub>LED</sub> = 5.0V	-----	140	200	mA	

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

NOTE (2): APPLIED TO TERMINALS D/I, R/W, E, DB0~DB7, CS1, CS2, RST

NOTE (3): THE DISPLAY PATTERN IS ALL "ON", OR ALL "OFF"

NOTE (4): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT 60.5V BY EACH MODULE.

## 7. Optical characteristics

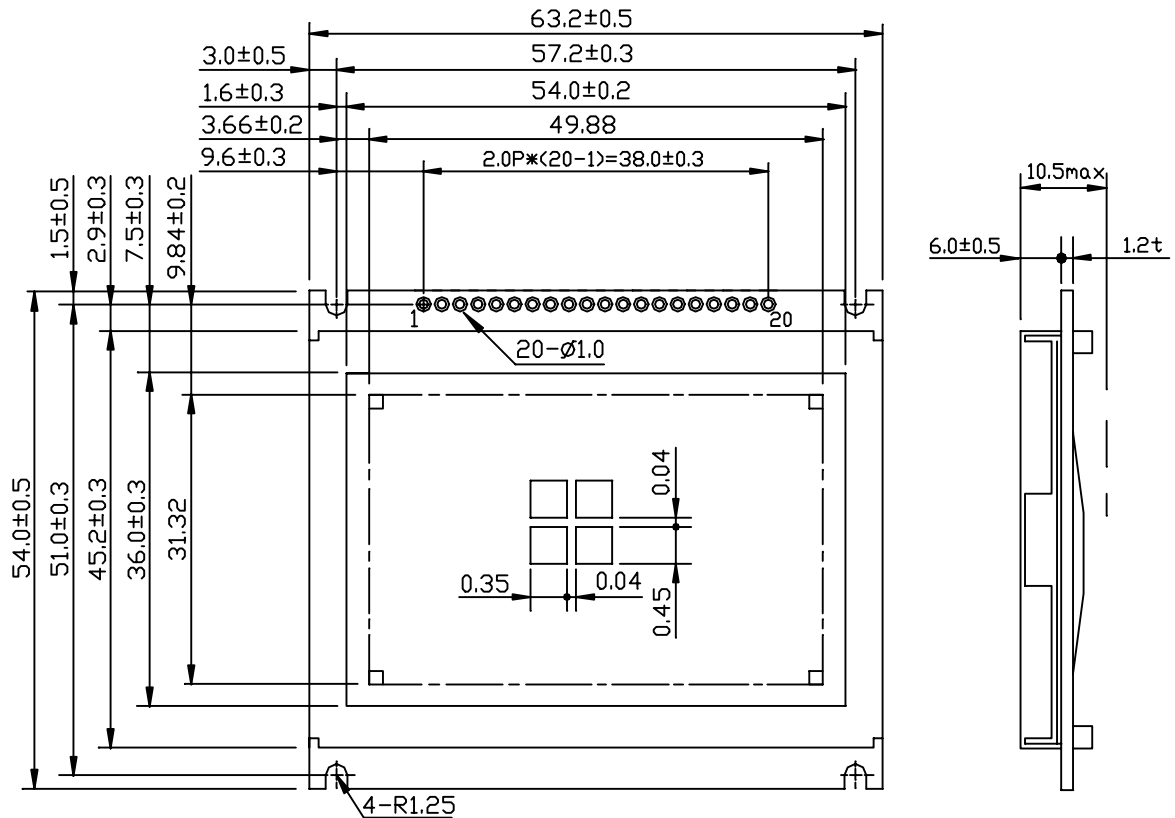
Ta = 25°C VDD-V<sub>O</sub> = 8.5V

<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	30	40	-----	deg.	1
CONTRAST RATIO	K	Φ = 10° θ = 0°	3.0	4.0	-----	-----	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°	4.0	-----	-----	cd/m <sup>2</sup>	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.

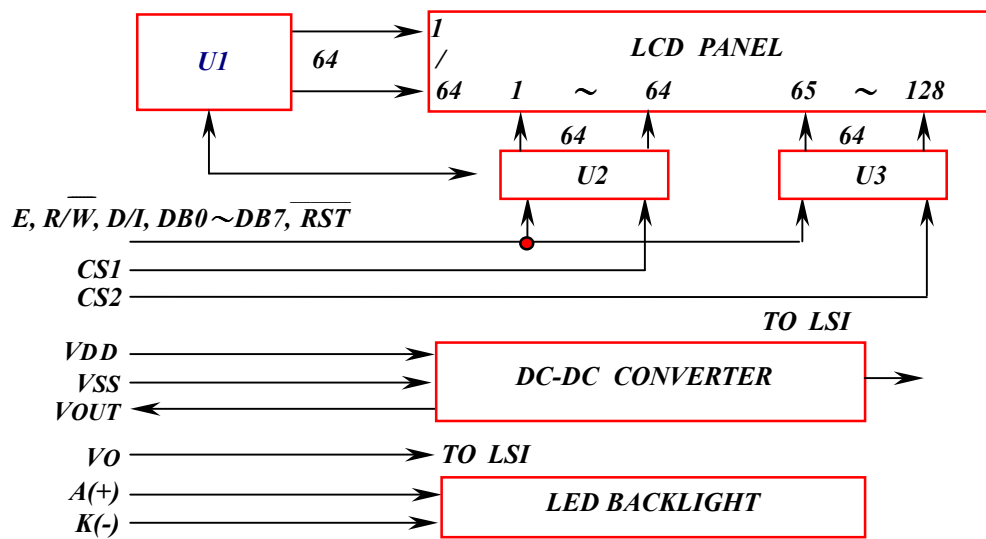
## 8. Outline dimension



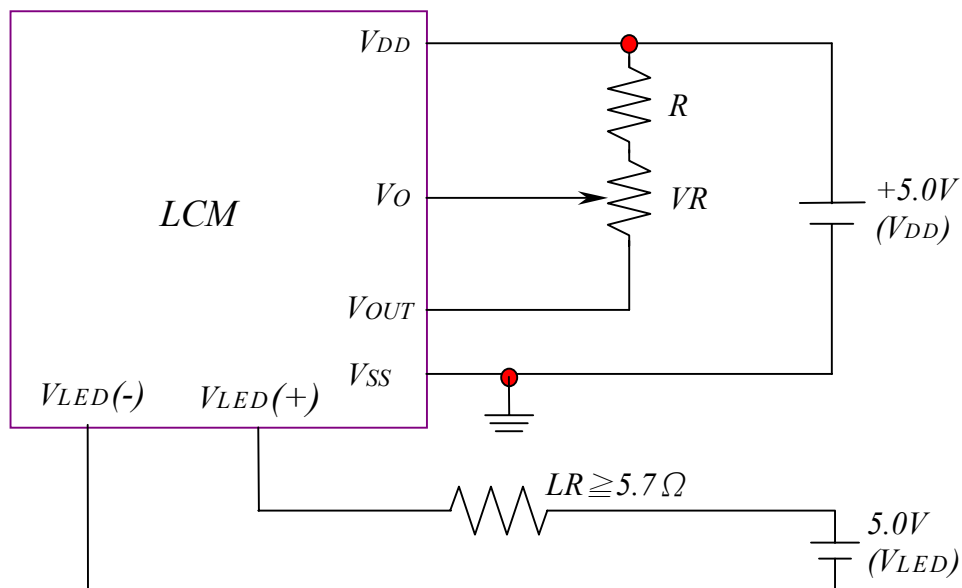
## Interface

PIN NO.	SYMBOL	FUNCTION
1	V <sub>SS</sub>	GROUND
2	V <sub>DD</sub>	POWER SUPPLY FOR LOGIC
3	V <sub>O</sub>	OPERATING VOLTAGE FOR LCD DRIVING
4	D/I	H: DATA INPUT L: INSTRUCTION CODE INPUT
5	R/ $\overline{\text{W}}$	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	$\overline{\text{RST}}$	L: RESET
18	V <sub>OUT</sub>	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:  $V_{DD} - V_0 \geq 1.5V$

$V_{DD} - V_0$ : LCD DRIVING VOLTAGE

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