



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

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

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PART NO. : PMC1604B-SBLW

FOR MESSRS. : \_\_\_\_\_

## ***CONTENTS***

<b><i>NO.</i></b>	<b><i>ITEM</i></b>	<b><i>PAGE</i></b>
1.	COVER	1
2.	RECORD OF REVISION	2
3.	GENERAL SPECIFICATION	3
4.	MECHANICAL DATA	3
5.	ABSOLUTE MAXIMUM RATINGS	4
6.	ELECTRICAL CHARACTERISTICS	5
7.	OPTICAL CHARACTERISTICS	5
8.	OUTLINE DIMENSION	6
9.	BLOCK DIAGRAM	7
10.	POWER SUPPLY	7



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-10-12780)”.

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

### 4. Mechanical data

- (1) NUMBER OF CHARACTER ----- 16 CH \* 4 LINE
- (2) MODULE SIZE ----- 87.0 W \* 60.0 H \* 15.0 T (Max) mm
- (3) EFFECTIVE AREA ----- 61.8 W \* 25.2 H mm
- (4) CHARACTER PATTERN ----- 5 \* 7 DOTS + CURSOR
- (5) CHARACTER SIZE ----- 2.96 W \* 4.16 H mm
- (6) CHARACTER PITCH----- 3.55 mm
- (7) DOT SIZE----- 0.56 W \* 0.56 H mm
- (8) DOT PITCH ----- 0.60 W \* 0.60 H mm
- (9) VIEWING DIRECTION ----- 6 O’CLOCK
- (10) LCD TYPE ----- STN.BLUE.TRANSMISSIVE.
- (11) LED 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 <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 BACKLIGHT	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	0°C	50°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** $T_a = 25^{\circ}\text{C}$   $V_{DD} = 5.0 \pm 0.25\text{ V}$ 

<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	
	$V_{IL}$	-----	-----	-----	0.6	V	
OUTPUT VOLTAGE	$V_{OH}$	$-I_{OH} = 0.2\text{ mA}$	2.4	-----	-----	V	
	$V_{OL}$	$I_{OH} = 1.2\text{ mA}$	-----	-----	0.4	V	
POWER SUPPLY CURRENT	$I_{DD}$	$V_{DD} = 5.0\text{ V}$	-----	1.5	2.0	mA	
RECOMMENDED LCD DRIVING VOLTAGE	$V_{DD}-V_O$	DUTY= 1/16 $\varnothing=10^{\circ}$	$T_a=0^{\circ}\text{C}$	-----	4.9	-----	V
			$T_a=25^{\circ}\text{C}$	-----	4.5	-----	V
			$T_a=50^{\circ}\text{C}$	-----	4.1	-----	V
POWER SUPPLY CURRENT FOR LED BACKLIGHT	$I_{LED}$	$V_{LED} = 5.0\text{V}$	-----	60	90	mA	

NOTE (1): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT  $\pm 0.5\text{V}$  BY EACH MODULE.

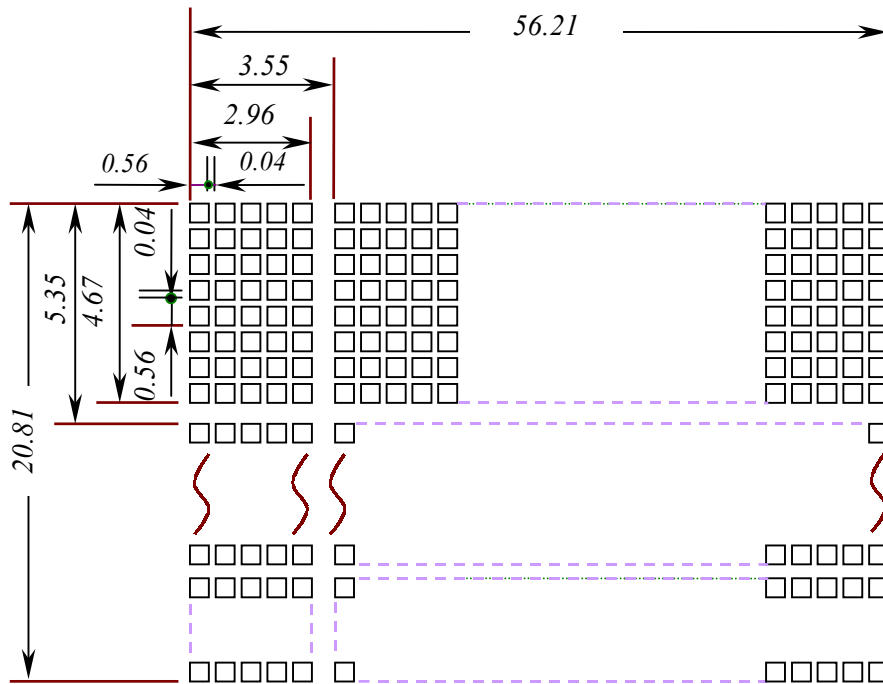
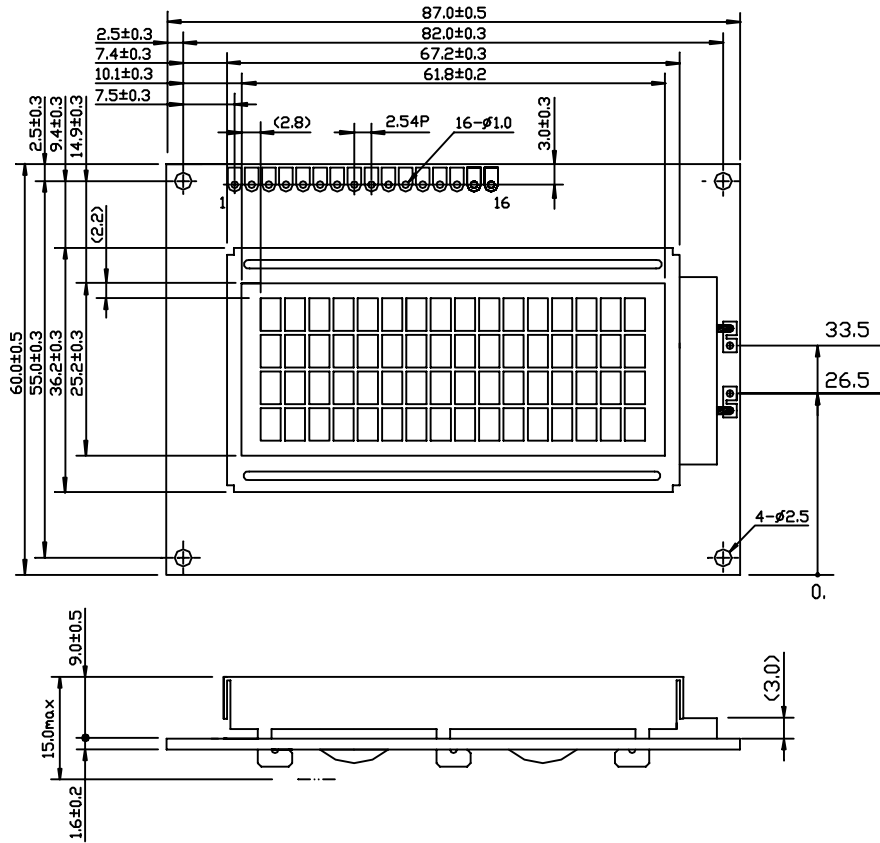
**7. Optical characteristics** $T_a = 25^{\circ}\text{C}$   $V_{DD} = 5.0\text{V}$ 

<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>	<i>NOTE</i>
VIEWING ANGLE	$\Phi 2-\Phi 1$	$K = 2.0$	30	40	-----	deg.	2
CONTRAST RATIO	K	$\Phi = 10^{\circ}$ $\theta = 0^{\circ}$	4	5	-----	-----	2
RESPONSE TIME	tr (rise)	$\Phi = 10^{\circ}$ $\theta = 0^{\circ}$	-----	200	350	ms	2
	tf (fall)	$\Phi = 10^{\circ}$ $\theta = 0^{\circ}$	-----	300	400	ms	2
BRIGHTNESS FOR LED BACKLIGHT	B	$\Phi = 0^{\circ}$ $\theta = 0^{\circ}$	6.0	-----	-----	$\text{cd/m}^2$	2,3

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

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

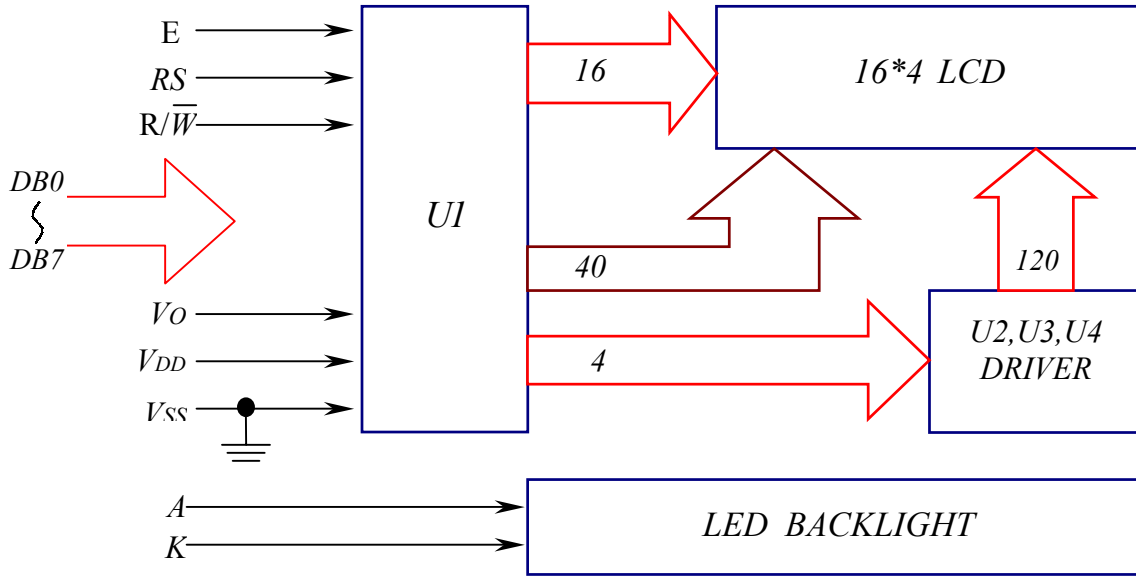
### 8. Outline dimension



#### Interface pin connection

<b>PIN NO.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
SYMBOL	V <sub>SS</sub>	V <sub>DD</sub>	V <sub>O</sub>	RS	R/ $\bar{W}$	E	DB0	DB1
<b>PIN NO.</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>
SYMBOL	DB2	DB3	DB4	DB5	DB6	DB7	A	K

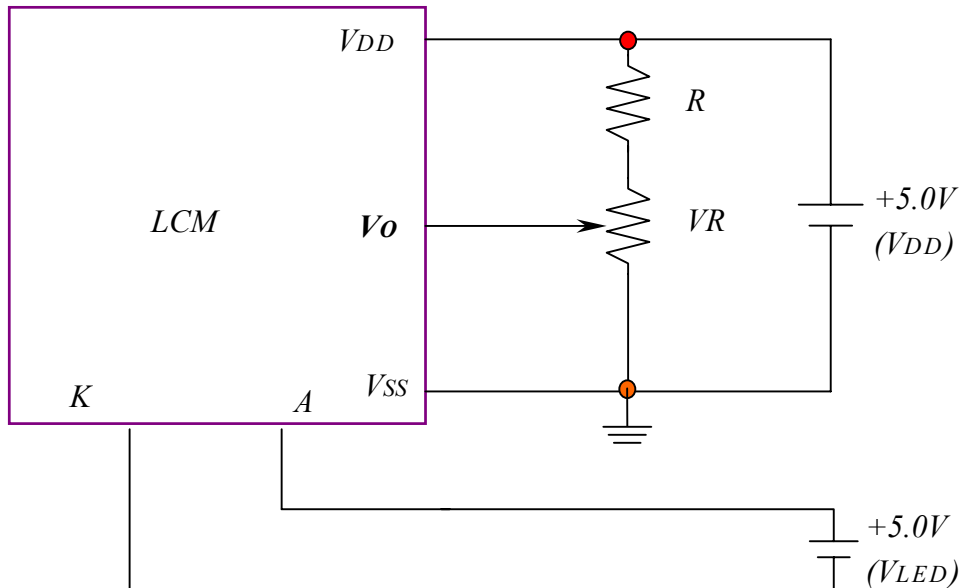
### 9 Block diagram



### Display data address charts

Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE 1	80	81	82	83	84	85	86	87	88	89	8A	8B	8C	8D	8E	8F
LINE 2	C0	C1	C2	C3	C4	C5	C6	C7	C8	C9	CA	CB	CC	CD	CE	CF
LINE 3	90	91	92	93	94	95	96	97	98	99	9A	9B	9C	9D	9E	9F
LINE 4	D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	DA	DB	DC	DD	DE	DF

### 10. Power supply for LCM



RECOMMENDED RESISTOR R:  $V_{DD} - V_0 \geq 1.5V$   
 $V_{DD} - V_0$ : LCD DRIVING VOLTAGE  
 VR:  $10K\Omega \sim 20K\Omega$