



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

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

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**PART NO. : PMC4004AW-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-10-12780)”.

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

### 4. Mechanical data

- (1) NUMBER OF CHARACTERS-----40 CH \* 4 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 -----2.78 W \* 4.27 H mm
- (6) CHARACTER PITCH-----3.53 W \* 5.49 H mm
- (7) DOT SIZE -----0.50 W \* 0.55 H mm
- (8) DOT PITCH-----0.57 W \* 0.62 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)

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 V<sub>DD</sub> = 5.0±0.25 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>	
INPUT VOLTAGE	V <sub>IH</sub>	-----	2.2	-----	V <sub>DD</sub>	V	
	V <sub>IL</sub>	-----	V <sub>SS</sub>	-----	0.6	V	
OUTPUT VOLTAGE	V <sub>OH</sub>	-I <sub>OH</sub> = 0.2 mA	2.4	-----	-----	V	
	V <sub>OL</sub>	I <sub>OL</sub> = 1.2 mA	-----	-----	0.4	V	
POWER SUPPLY CURRENT	I <sub>DD</sub>	V <sub>DD</sub> = 5.0 V	-----	2.5	3.5	mA	
RECOMMENDED LCD DRIVING VOLTAGE , NOTE (1)	V <sub>DD</sub> -V <sub>O</sub>	DUTY = 1/16 Φ = 10° θ = 0°	Ta = -20°C	-----	4.8	-----	V
			Ta = 25°C	-----	4.5	-----	V
			Ta = 70°C	-----	4.2	-----	V
POWER SUPPLY CURRENT FOR LED	I <sub>LED</sub>	V <sub>DD</sub> = 5.0V	-----	270	330	mA	

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

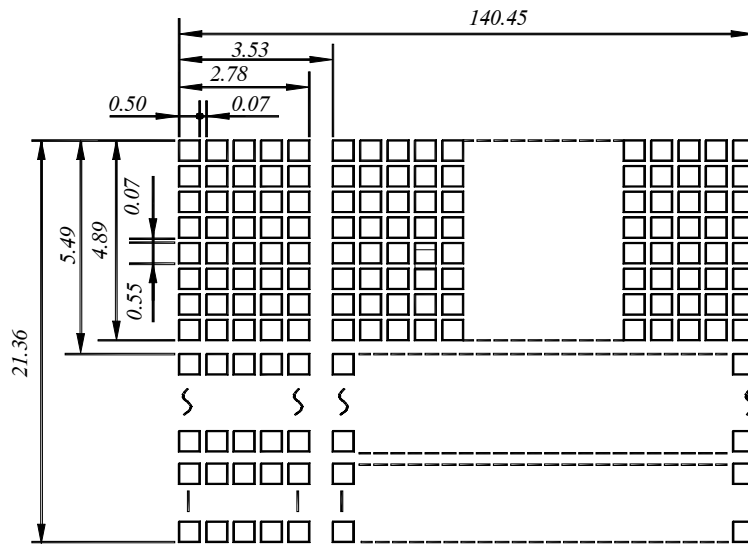
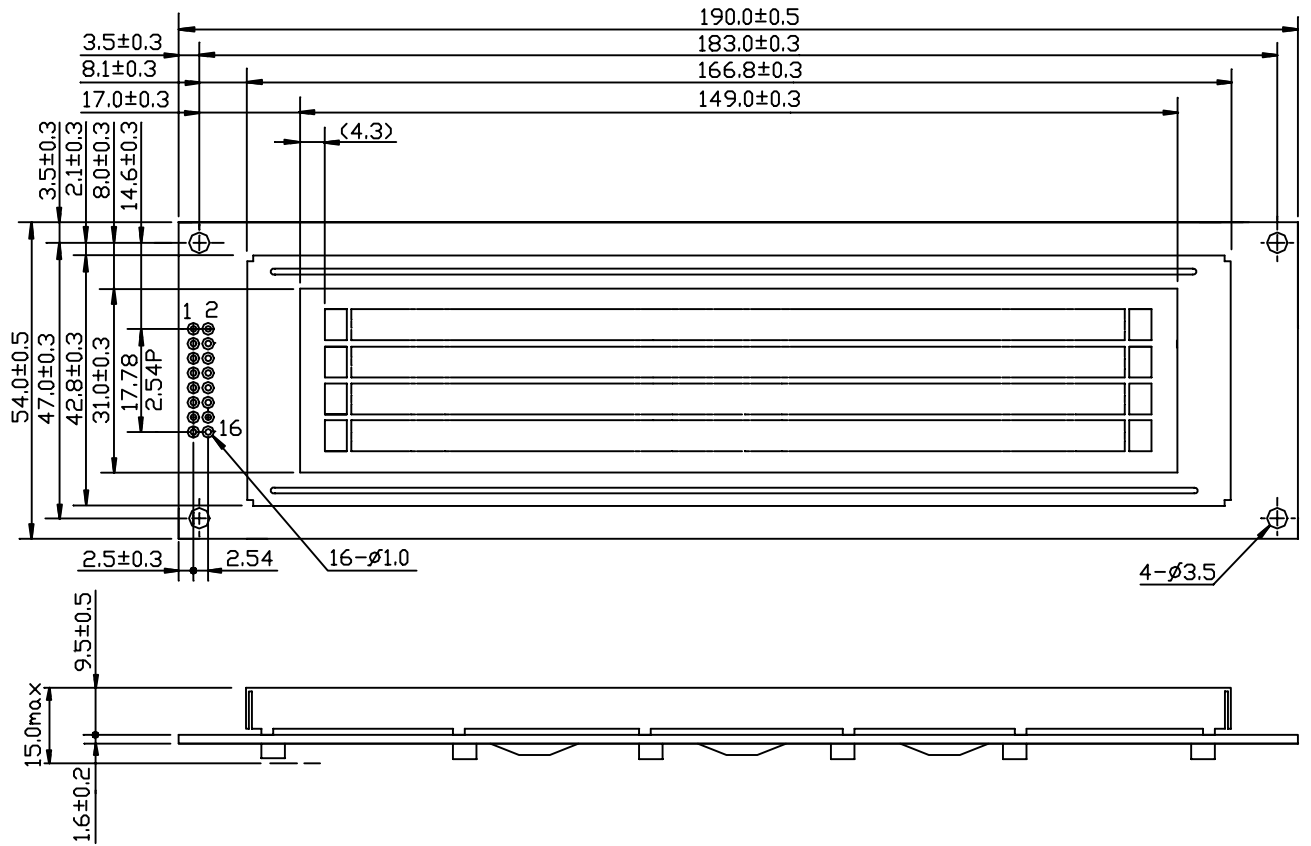
**7. Optical characteristics**Ta = 25°C V<sub>DD</sub> = 5.0V

<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	Φ <sub>2</sub> -Φ <sub>1</sub>	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°	5.0	-----	-----	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.

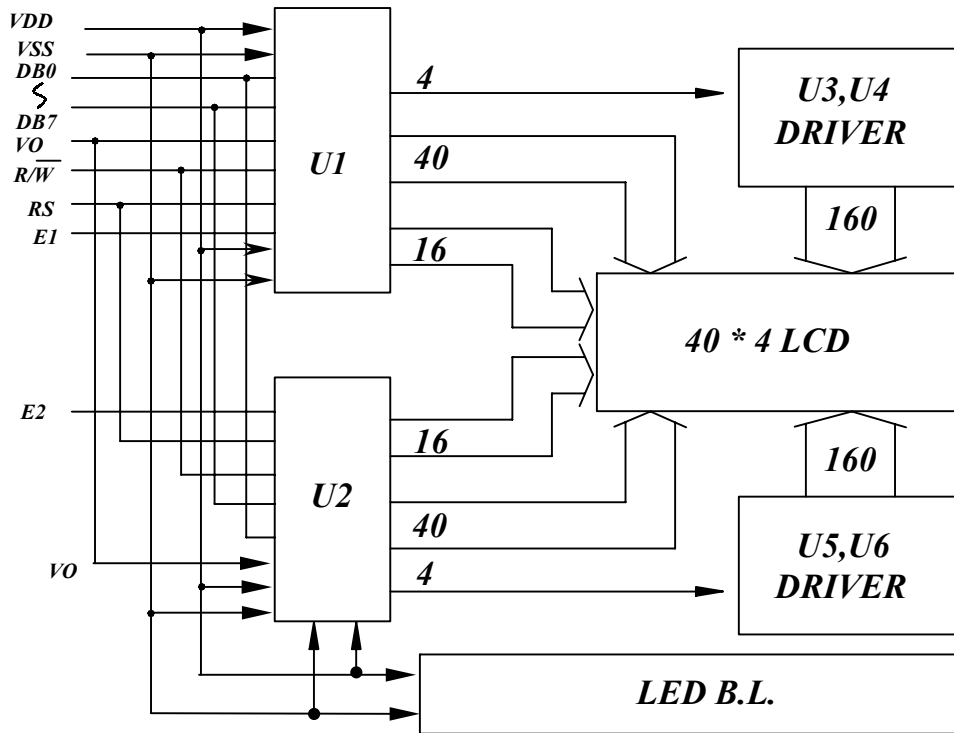
### 8. Outline dimension



### Interface pin 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	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
<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	E1	R/ $\bar{W}$	RS	V <sub>0</sub>	V <sub>SS</sub>	V <sub>CC</sub>	E2	NC

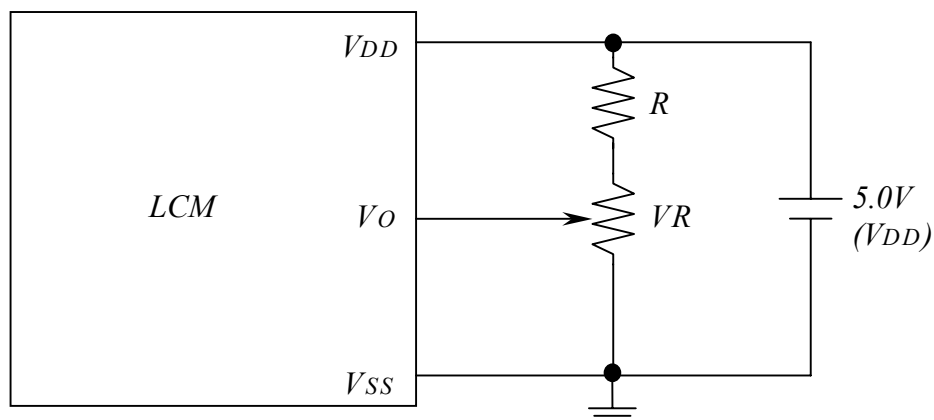
### 9 Block diagram



### Display data address charts

Character	1	2	3	4	5	6	7	8	9	0A	0B	0C	0D	0E	0F	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F	30	31	32	33	34	35	36	37	38	39	40
LINE1	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F	30	31	32	33	34	35	36	37		
LINE2	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F	50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F	60	61	62	63	64	65	66	67		
LINE3	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F	30	31	32	33	34	35	36	37		
LINE4	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F	50	51	52	53	54	55	56	57	58	59	5A	5B	5C	5D	5E	5F	60	61	62	63	64	65	66	67		

### 10. Power supply for LCM



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