

FEATURES

| AVAILABLE OPTIONS | CHARACTERISTICS | CODE | No. |
|----------------------------|---|-----------|-----|
| DISPLAY FORMAT | 16 Characters by 4 Lines | FC1604A04 | 1~6 |
| POLARIZER OPTIONS | Negative Transmissive | N | 7 |
| BACKLIGHT TYPE OPTIONS | Edge Type LED Backlight (Standard version) | S | 8 |
| BACKLIGHT COLOR OPTIONS | White color | W | 9 |
| LCD PANEL OPTIONS | Blue STN | B | 10 |
| VIEWING ANGLE OPTIONS | 6:00 (Bottom) | B | 11 |
| TEMPERATURE RANGE OPTIONS | -20°C ~ 70°C, Single Supply Voltage | W | 12 |
| SUGGESTED DRIVING VOLTAGE | V _{lcm} = 3.0V V _{led} = 3.0V | 9 | 13 |
| SUGGESTED LED DRIVING MODE | PIN15: LED+, PIN16:LED- | 1 | 14 |
| CONTROLLER ▲1 | SPLC780D | L | 15 |
| FONT MAP CODE | E Version | E | 16 |
| DRIVING DUTY | 1/16 | — | — |
| DRIVING BIAS | 1/5 | — | — |

▲1 Please ask for datasheet of the mentioned controller from FORDATA or FORDATA's authorized distributors. You can find the related information including AC & DC characteristics, Write & Read Timing diagram, Instruction table and descriptions, DDRAM & CGRAM, Rest Function and so on from the datasheet of controller.

▲1 You can ask for the example of software program (C language) from FORDATA or FORDATA's authorized distributors.



MECHANICAL SPECIFICATIONS

| | | | | | |
|----------------|---------------|----|-----------------|---------------|----|
| OVERALL SIZE | 87.0W x 60.0H | mm | THICKNESS | max 14.5 | mm |
| VIEWING AREA | 61.8W x 25.2H | mm | HOLE-HOLE | 82.0W x 55.0H | mm |
| CHARACTER SIZE | 2.96W x 4.76H | mm | CHARACTER PITCH | 0.59W x 0.59H | mm |
| DOT SIZE | 0.56W x 0.56H | mm | DOT PITCH | 0.04W x 0.04H | mm |

ABSOLUTE MAXIMUM RATINGS

| ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|-----------------------|------------------|-----------|-----------------------|-----|----------------------|------|
| POWER SUPPLY (LOGIC) | V _{dd} | 25°C | -0.3 | — | 7.0 | V |
| POWER SUPPLY (LCD) | V ₀ | 25°C | V _{dd} -13.5 | — | V _{dd} +0.3 | V |
| INPUT VOLTAGE | V _{in} | 25°C | -0.3 | — | V _{dd} +0.3 | V |
| OPERATING TEMPERATURE | V _{opr} | — | -20 | — | 70 | °C |
| STORAGE TEMPERATURE | V _{stg} | — | -30 | — | 80 | °C |

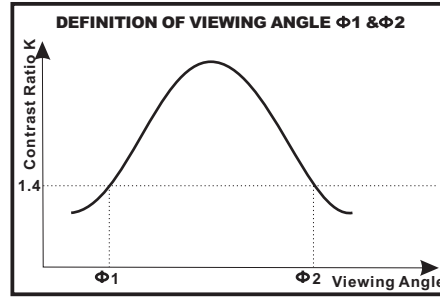
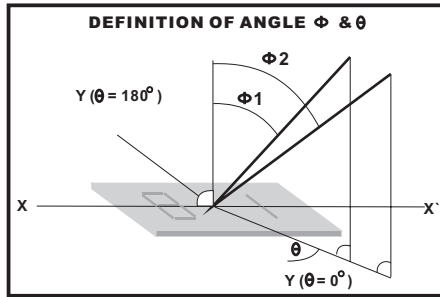
ELECTRONIC CHARACTERISTICS *

| ICONS | ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|---|-------------------------------|--|---------------------|-----|-----|-----|------|
|  | INPUT VOLTAGE | V _{lcm} = V _{dd} | — | — | 3.0 | — | V |
| | SUPPLY CURRENT | I _{dd} | V _{dd} =3V | — | 1.5 | — | mA |
|  | DRIVING VOLTAGE FOR LCD PANEL | V _{lcd} = (V _{dd} - V ₀) | -20°C | — | — | — | V |
| | | | 0°C | — | — | — | |
| | | | 25°C | — | — | — | |
| | | | 50°C | — | — | — | |
| | | | 70°C | — | — | — | |

* All data are recorded from TEST REPORT #FSYP044200031

LCD CHARACTERISTICS

| FOR STN/FSTN TYPE LCD Panel (TA=25 °C, Vlcd=3.0V ± 0.25V) | | | | | | | |
|---|---------------------|-------------------|-----------|-----|-----|-----|------|
| ICONS | ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
| | VIEWING ANGLE | $\Phi 2 - \Phi 1$ | K=4 | 40 | — | — | deg |
| | | θ | | 60 | | | |
| | CONTRAST RATIO | K | — | — | 10 | — | — |
| | RESPONSE TIME(RISE) | TR | — | — | 150 | 250 | ms |
| | RESPONSE TIME(FALL) | TF | — | — | 150 | 250 | ms |



LED CHARACTERISTICS

| ICONS | ITEM | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|------------------|------------------------------|----------------|----------------|------|-----|-------|-------------------|
| | LED FORWARD VOLTAGE | Vf | 25°C If = 15mA | 2.8 | — | 3.0 | V |
| | LED FORWARD CURRENT ▲2 | If | 25°C | — | 15 | — | mA |
| | LED REVERSE CURRENT | Ir | 25°C Vr=5.0V | — | — | 10 | μA |
| | LED COLOR RANGE | X coordinate | 25°C If = 15mA | 0.26 | — | 0.30 | — |
| | | Y coordinate | | 0.27 | — | 0.31 | — |
| | LED BRIGHTNESS (WITHOUT LCD) | Lv | 25°C If = 15mA | — | 193 | — | cd/m ² |
| | LED BRIGHTNESS UNIFORMITY | Lvmin/Lvmax | 25°C If = 15mA | 70 | — | — | Ratio |
| LED LIFE TIME ▲3 | — | 25°C If = 15mA | 9K | — | — | Hours | |

▲2 请注意, 驱动背光考虑的是恒流而不是恒压. 所以, 这个数值非常重要!

YOUR ATTENTION: It is constant current (not constant voltage) that should be applied when driving LED backlight. Therefore, this data is very important!

* 当工作温度高于25°C时, Ifm, Ifp和Pd必须降低; 电流降低率是 -0.36*1mA/°C (直流驱动), 或-0.86*1mA/°C (脉冲驱动), 功率降低率是-75*1mW/°C. 产品工作电流不能大于对应的工作条件温度Ifm或Ifpr的60%.
For operation above 25°C, The Ifm Ifp & Pd must be derated, the Current derating is -0.36*1mA/°C for DC drive and -0.86*1 mA/°C for Pulse drive, the power dissipation is -75*1 mW/°C The product working current must not be more than 60% of the Ifm or Ifp according to the working temperature.

▲3 如果您需要让背光连续不间断工作超过8小时, 那么不建议您采用这款背光. 福德电子可以提供您长寿背光的解决方案.

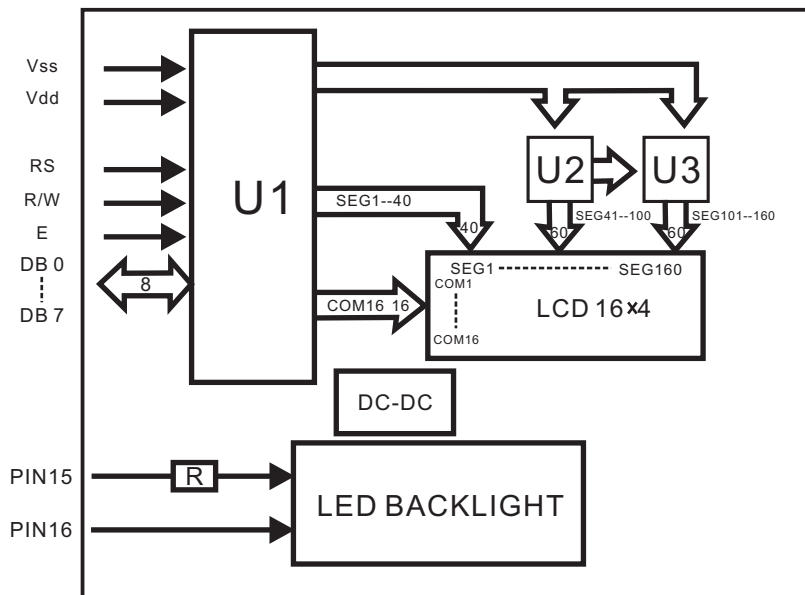
If you want to drive the LED Backlight uninterruptedly over 8hours, this version is not suggested. Please consult long life design solution from FORDATA or FORDATA's authorized distributors.



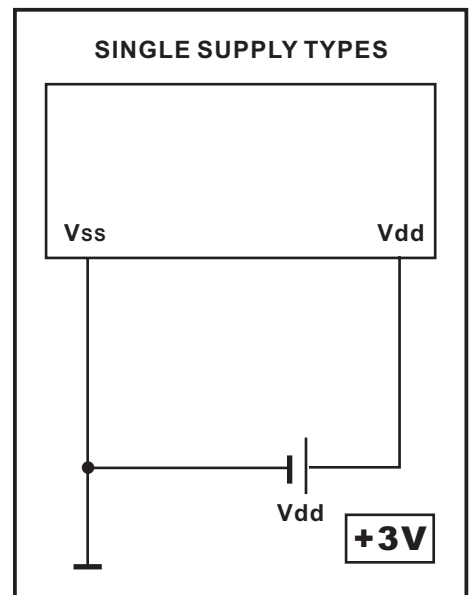
PIN ASSIGNMENT

| PIN | SYMBOL | DESCRIPTION | REMARKS |
|-----|--------|------------------------|---------|
| 1 | Vss | GND | |
| 2 | Vdd | Power supply for LCM | +3.0V |
| 3 | NC | No connection | |
| 4 | RS | Register Select Signal | |
| 5 | R/W | Data Read / Write | |
| 6 | E | Enable Signal | |
| 7 | DB0 | Data bus line | |
| 8 | DB1 | Data bus line | |
| 9 | DB2 | Data bus line | |
| 10 | DB3 | Data bus line | |
| 11 | DB4 | Data bus line | |
| 12 | DB5 | Data bus line | |
| 13 | DB6 | Data bus line | |
| 14 | DB7 | Data bus line | |
| 15 | LED+ | Power supply for BKL | +3.0V |
| 16 | LED- | Power supply for BKL | 0V |

BLOCK DIAGRAM

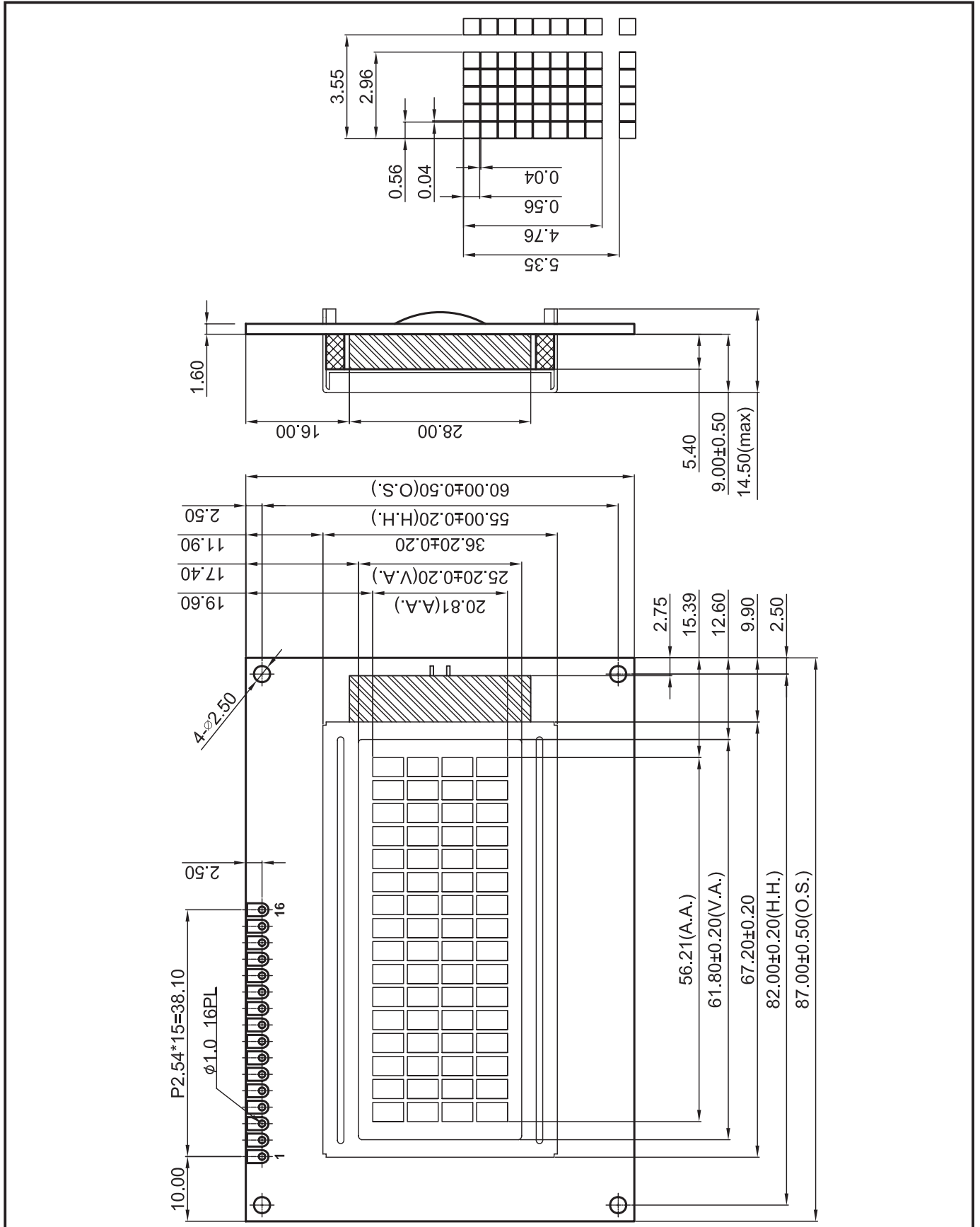


POWER SUPPLY DIAGRAM



| Upper 4bit Lower 4bit | LLLL | LLLH | LLHL | LLHH | LHLL | LHLH | LHHL | LHHH | HLLL | HLLH | HLHL | HLHH | HHLL | HHLH | HHHL | HHHH |
|--------------------------------|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| LLLL | CG RAM (1) | | | | | | | | | | | | | | | |
| LLLH | (2) | | | | | | | | | | | | | | | |
| LLHL | (3) | | | | | | | | | | | | | | | |
| LLHH | (4) | | | | | | | | | | | | | | | |
| LHLL | (5) | | | | | | | | | | | | | | | |
| LHLH | (6) | | | | | | | | | | | | | | | |
| LHHL | (7) | | | | | | | | | | | | | | | |
| LHHH | (8) | | | | | | | | | | | | | | | |
| HLLL | (1) | | | | | | | | | | | | | | | |
| HLLH | (2) | | | | | | | | | | | | | | | |
| HLHL | (3) | | | | | | | | | | | | | | | |
| HLHH | (4) | | | | | | | | | | | | | | | |
| HHLL | (5) | | | | | | | | | | | | | | | |
| HHLH | (6) | | | | | | | | | | | | | | | |
| HHHL | (7) | | | | | | | | | | | | | | | |
| HHHH | (8) | | | | | | | | | | | | | | | |

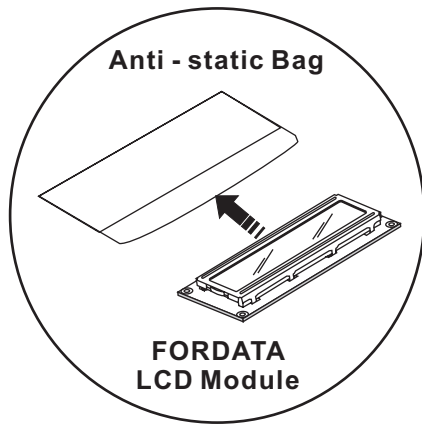




| FULL-SIZED PACKAGE |
|------------------------------|
| 30 PCS/BOX |
| 8 BOXES/CARTON |
| 240 PCS/CARTON |
| 18.00 KGS/CTN(G.W.) |
| 0.054 M ³ /CARTON |

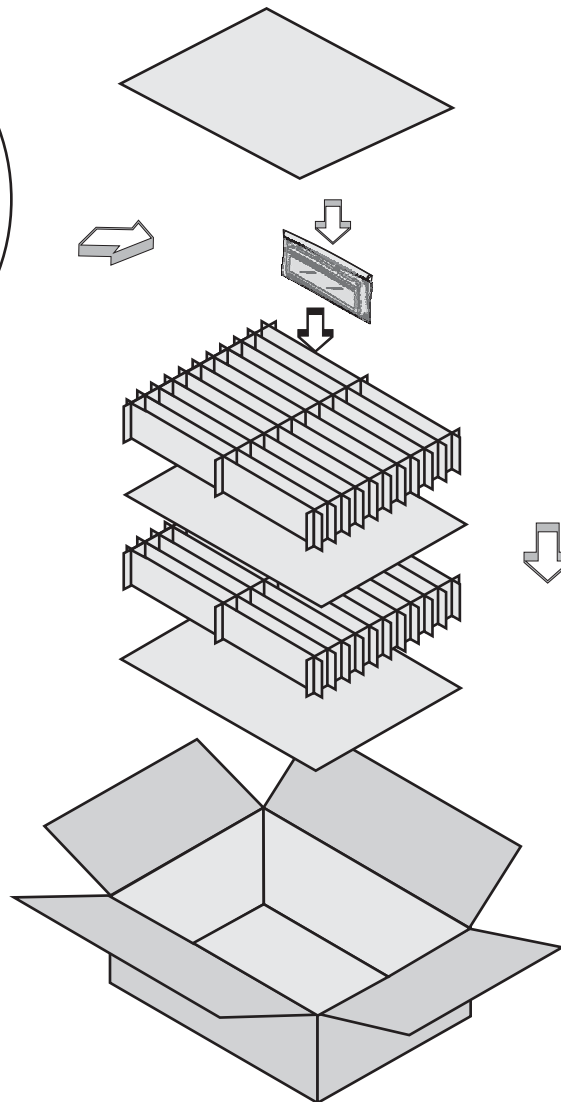
| HALF-SIZED PACKAGE |
|------------------------------|
| 30 PCS/BOX |
| 4 BOXES/CARTON |
| 120 PCS/CARTON |
| 9.00 KGS/CTN(G.W.) |
| 0.027 M ³ /CARTON |

| PACKING DECLARATION |
|--|
| 1. This packaging information is for reference only. The actual information is subject to the actual packaging. Especially for packaging of LCL, tolerances may exist. |
| 2. FORDATA will not be responsible for quality problems caused by unnormal transportation conditions (including but not limited to climate factors or human factors, such as improper handling). |



BOX 

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