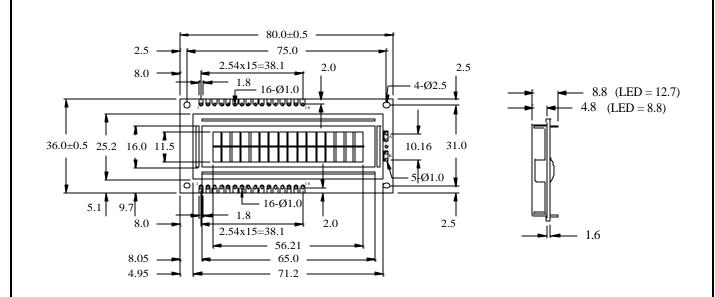


## PC1602A-L (16x2) Character LCD Display

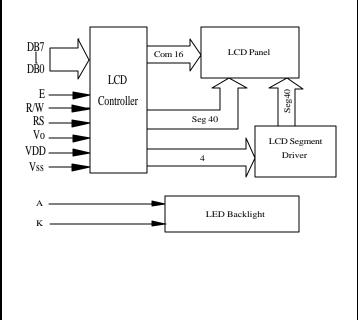
|  | PCIO                                | 602A-L (1                             | 6x2) (                         | Chara (      | cter       | LCD .       | Disp   | lay                   |            |          |
|--|-------------------------------------|---------------------------------------|--------------------------------|--------------|------------|-------------|--------|-----------------------|------------|----------|
| Features                                       |                                     |                                       | Abso                           | lute Ma      | aximu      | ım Ratii    | ngs at | $T_A = 25$            | C,C        |          |
| *16 Character, 2 Line                          | •                                   |                                       | Item                           | Į.           |            | Sy          | mbol   | Min                   | Max        | Unit     |
| *View Angle 12H or 6H<br>*TN or STN Fluid      | -                                   | Power Supply                          | (Logic)                        |              |            | ,           | Vdd    | -0.3                  | 7.0        | V        |
| *Extended Temperatur                           | e Range                             | Power Supply                          | (LCD)                          |              |            |             | Vo     | Vdd -0.3              | Vdd 12.0   | V        |
| available  *Several Character Types            | s                                   | Input Voltage                         |                                |              |            |             | Vi     | - 0.3                 | Vdd        | V        |
| available *LED or EL Backlight av              |                                     | Operating Tem                         | perature (                     | Standard)    | )          | 7           | Горг   | 0                     | 50         | °C       |
| LED of EL Backlight av                         | anaore                              | Storage Tempe                         | Storage Temperature (Standard) |              |            | -           | Γstg   | - 20                  | 70         | °C       |
|  | -                                   | <b>Extended Operating Temperature</b> |                                |              |            | 7           | Горг   | - 20                  | 70         | °C       |
|  | <b>Extended Storage Temperature</b> |                                       |                                |              | 7          | Γstg        | - 30   | 80                    | °C         |          |
|  | Electr                              | ical Charact                          | eristics a                     | at $T_A = 1$ | 25 °C      | , Vdd=5     | V+0.2  | 25V                   |            |          |
| Item   |                                     | Symbo                                 |                                | Min          |            | T           |        |                       | lax        | Unit     |
| Power Supply (Logic)                           |                                     | Vdd-Vs                                | s                              | 4.7          |            | 5.          | .0     | 5                     | 1.3        | V        |
| Supply Current                                 |                                     | Idd                                   |                                | _            |            | 2.          | .0     | 3                     | .0         | mA       |
| LCD Driving Voltage                            |                                     | Vdd - Vo                              | 0                              | 4.2          |            | 4.          | .5     | 4                     | .8         | V        |
| Input Voltage "H"                              |                                     | Vih 2.2                               |                                |              |            | _           | V      | dd                    | V          |          |
| Input Voltage "L"                              |                                     | Vil — —                               |                                |              | 0          | .6          | V      |                       |            |          |
| Output Voltage "H"                             |                                     | Voh                                   |                                | 2.4          |            | -           | _      | -                     | _          | V        |
| Output Voltage "L"                             |                                     | Vol                                   |                                |              |            | _           | _      | 0                     | .4         | V        |
|  |                                     | Int                                   | erface P                       | in Con       | nectio     | n           |        |                       |            |          |
| No Symbol Fu                                   | ınction                             |                                       |                                | No           | Symbo      | ol          | Functi | on                    |            |          |
|  | ower Supply                         |                                       |                                | 9            | DB2        |             |        | Bus Line 2            |            |          |
|  | ower Supply                         |                                       |                                | 10           | DB3        |             |        | Bus Line 3            |            |          |
|  | ontrast Adj                         |                                       |                                | 11           | DB4        |             |        | Bus Line 4            |            |          |
|  | ead/Write                           | egister Select                        |                                | 13           | DB5<br>DB6 |             |        | Bus Line 5 Bus Line 6 |            |          |
|  | nable Signal                        |                                       |                                | 14           | DB0<br>DB7 |             |        | Bus Line 7            |            |          |
|  | ata Bus Line                        |                                       |                                | 15           | A          |             |        |                       | LED Backli | oht (+)  |
|  | ata Bus Line                        |                                       |                                | 16           | K          |             |        |                       | LED Backli |          |
|  |                                     |                                       | Backligl                       |              |            | ons         |        | 11 7                  |            | <u> </u> |
| Forward Voltage                                |                                     | Forward Curre                         |                                | _            |            | Dissipation | 1      | Pea                   | ak Wavelen | gth      |
| 4.2V (Typ) 195mA (Max) 900mW (Max) 570nm (Typ) |                                     |                                       |                                |              |            |             |        |                       |            |          |
|  | Mechanical Specifications           |                                       |                                |              |            |             |        |                       |            |          |
| Item   | Overall S                           |                                       |                                | g Area       |            | racter Size | e Ch   | aracter Pitcl         | n Dot      | Size     |
| Specifications 80.0W x                         | 36.0H x 8.                          | 8T (BL12.7T)                          | 65.0W 2                        | x 16.0H      | 2.96       | W x 5.56I   | Н 3.5  | 5W x 5.94H            | I 0.56W    | x 0.66H  |
| All dimensions are in mm. To                   | olerance is $\pm 0$ .               | 3 Unless otherwise                    | specified                      |              |            |             |        |                       |            |          |



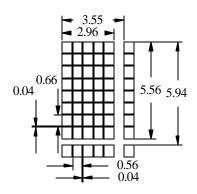
## PC1602A-L (16x2) Character LCD Display



## LCD Block Diagram



## Dot Layout

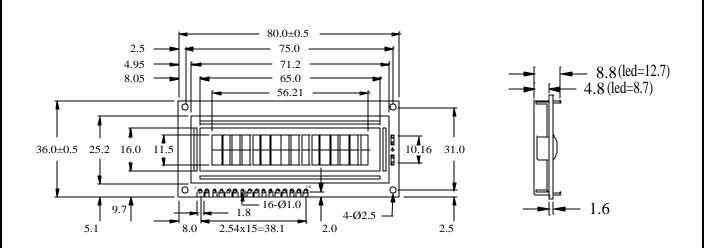




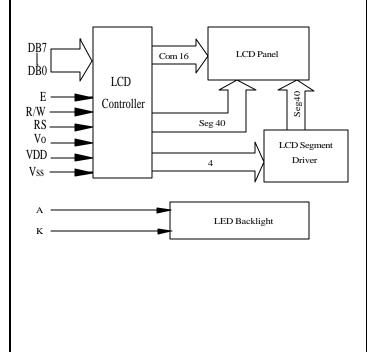
|      |   | P   | C160       | 2B-L (1                          | 6x2) (       | Chara    | cter    | LCD        | Disp   | lay           |             |          |
|------|---|---|------------|----------------------------------|--------------|----------|---------|------------|--------|---------------|-------------|----------|
| Fea  | atures  |   |            |                                  | Abso         | lute Ma  | aximu   | ım Rati    | ngs at | $T_A = 25$    | °C          |          |
|      | Character   |   |            |                                  | Item         | l        |         | Sy         | mbol   | Min           | Max         | Unit     |
|      | w Angle 1<br>or STN Fl  |   | Po         | ower Supply                      | (Logic)      |          |         |            | Vdd    | -0.3          | 7.0         | V        |
| *Ex  | tended Te   | mperature Ran                             | ge Po      | ower Supply                      | (LCD)        |          |         |            | Vo     | Vdd -0.3      | Vdd 12.0    | ) V      |
|      | i <mark>ilable</mark><br>veral Chara                              | cter Types                                | In         | put Voltage                      |              |          |         |            | Vi     | - 0.3         | Vdd         | V        |
| ava  | ilable  |   | 0          | Operating Temperature (Standard) |              |          | ,       | Горг       | 0 50   |               | °C          |          |
| *LE  | D or EL Ba  | or EL Backlight available  Storage Temper |            |                                  | erature (Sta | andard)  |         | ,          | Гstg   | - 20          | 70          | °C       |
|      |   |   |            | xtended Ope                      | -            | -        | re      |            | Горг   | - 20          | 70          | °C       |
|      |   |   |            | xtended Stor                     |              | _        |         |            | Tstg   | - 30          | 80          | °C       |
|      |   | El  | ectrics    | al Charact                       | eristics :   | at T. =  | 25 °C   | Vdd=       | 5V+0 ′ | 25V           |             |          |
|      |   | Item                                      | cente      | Symbo                            |              | Min      | 25 0    |            | yp     |               | <b>I</b> ax | Unit     |
| Pow  | er Supply (   |   |            | Vdd-Vs                           |              | 4.7      |         |            | .0     |               | 5.3         | V        |
|      | oly Current   |   |            | Idd                              |              | _        |         |            | .0     |               | 3.0         | mA       |
| LCD  | Driving V   | oltage                                    |            | Vdd -V                           | 0            | 4.2      |         | 4          | .5     | 4             | 1.8         | V        |
| Inpu | t Voltage "   | H"  |            | Vih 2.2                          |              |          |         |            | _      | Vdd           |             | V        |
| Inpu | t Voltage "   | L"  |            | Vil                              |              | _        |         |            | _      | C             | ).6         | V        |
| Outp | out Voltage   | "H"                                       |            | Voh                              |              | 2.4      |         | -          | _      | -             |             | V        |
| Outp | out Voltage   | "L"                                       |            | Vol                              |              | _        |         | _          | _      | C             | ).4         | V        |
|      |   |   |            | Int                              | erface P     | in Con   | nectio  | n          |        |               |             |          |
| No   | Symbol  | Function                                  | l          |                                  |              | No       | Symbo   | ol         | Functi | on            |             |          |
| 1    | Vss   | Power S                                   | apply (C   | GND)                             |              | 9        | DB2     |            | Data E | Bus Line 2    |             |          |
| 2    | Vdd   | Power S                                   | apply (+   | -5V)                             |              | 10       | DB3     |            | Data E | Bus Line 3    |             |          |
| 3    | Vo  | Contrast                                  |            |                                  |              | 11       | DB4     |            |        | Bus Line 4    |             |          |
| 4    | RS  | Instructi                                 | on/Regi    | ster Select                      |              | 12       | DB5     |            | Data E | Bus Line 5    |             |          |
| 5    | R/W   | Read/Wi                                   |            |                                  |              | 13       | DB6     |            |        | Bus Line 6    |             |          |
| 6    | Е   | Enable S                                  |            |                                  |              | 14       | DB7     |            |        | Bus Line 7    |             |          |
| 7    | DB0   | Data Bus                                  |            |                                  |              | 15       | A       |            |        | Supply for    |             | . ,      |
| 8    | DB1   | Data Bus                                  | Line 1     |                                  |              | 16       | K       |            | Power  | Supply for    | LED Backl   | ight (-) |
|      |   |   |            | LED                              | Backligl     | nt Speci | ificati | ons        |        |               |             |          |
|      | Forward Voltage Forward Current Power Dissipation Peak Wavelength |   |            |                                  |              |          |         |            |        |               |             |          |
|      | 4.2V (Typ) 195mA (Max) 900mW (Max) 570nm (Typ)                    |   |            |                                  |              |          |         |            |        |               |             |          |
|      |   |   |            | Me                               | chanical     | Specifi  | cation  | ıs         |        |               |             |          |
|      | Item  | Ove                                       | rall Size  | ;                                | Viewin       | g Area   | Cha     | racter Siz | e Ch   | aracter Pitcl | h Do        | t Size   |
| Spec | cifications   | 80.0W x 36.0H                             | x 8.8T     | (BL12.7T)                        | 65.0W        | x 16.0H  | 2.96    | W x 5.56   | H 3.5  | 5W x 5.94H    | 0.56W       | x 0.66H  |
| All  | dimensions a  | re in mm. Tolerance                       | is ± 0.3 U | Jnless otherwise                 | specified    |          |         |            |        |               |             |          |



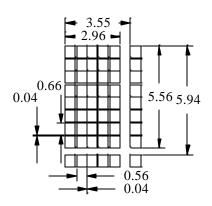
## PC1602B-L (16x2) Character LCD Display



## LCD Block Diagram



## Dot Layout



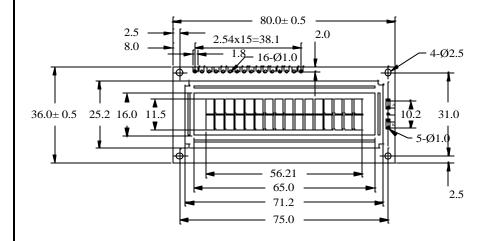


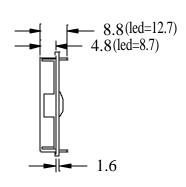
## PC1602C-L (16x2) Character LCD Display

#### Features Absolute Maximum Ratings at $T_A = 25$ °C \*16 Character, 2 Line Symbol Min Max Unit \*View Angle 12H or 6H V Power Supply (Logic) Vdd -0.3 7.0 \*TN or STN Fluid \*Extended Temperature Range Power Supply (LCD) Vo Vdd - 0.3Vdd 12.0 V available Vi - 0.3 V Input Voltage Vdd \*Several Character Types available Operating Temperature (Standard) Topr 0 50 °C \*LED or EL Backlight available °C 70 Storage Temperature (Standard) Tstg - 20 **Extended Operating Temperature** Topr - 20 70 °C **Extended Storage Temperature** - 30 80 $^{\circ}C$ Tstg Electrical Characteristics at $T_A = 25$ °C, Vdd=5V+0.25VItem Symbol Min Max Unit Тур V Power Supply (Logic) Vdd-Vss 4.7 5.0 5.3 Supply Current Idd 2.0 4.0 mΑ V LCD Driving Voltage Vdd -Vo 4.2 4.5 4.8 Input Voltage "H" Vih 2.2 Vdd V Input Voltage "L" Vil 0.6 V V Output Voltage "H" Voh 2.4 Output Voltage "L" Vol 0.4 V **Interface Pin Connection** Function No Symbol **Function** Symbol DB2 Vss Power Supply (GND) Data Bus Line 2 Data Bus Line 3 2 Vdd Power Supply (+5V) 10 DB3 3 Vo 11 DB4 Data Bus Line 4 Contrast Adjust 4 RS Instruction/Register Select 12 DB5 Data Bus Line 5 R/W 5 Read/Write 13 DB6 Data Bus Line 6 6 Е 14 DB7 Data Bus Line 7 Enable Signal Data Bus Line 0 15 Power Supply for LED Backlight (+) DB0 Α DB1 Data Bus Line 1 16 K Power Supply for LED Backlight (-) **LED Backlight Specifications** Forward Voltage Forward Current Power Dissipation Peak Wavelength 4.2V (Typ) 195mA (Max) 900mW (Max) 570nm (Typ) **Mechanical Specifications** Item Overall Size Viewing Area Character Size Character Pitch Dot Size 80.0W x 36.0H x 8.8T (BL12.7T) 65.0W x 16.0H 2.96W x 5.56H 3.55W x 5.94H 0.56W x 0.66H Specifications All dimensions are in mm. Tolerance is $\pm 0.3$ Unless otherwise specified

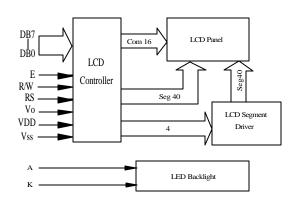


## PC1602C-L (16x2) Character LCD Display

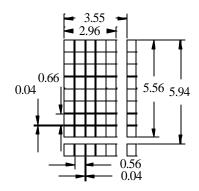




## LCD Block Diagram



#### Dot Layout

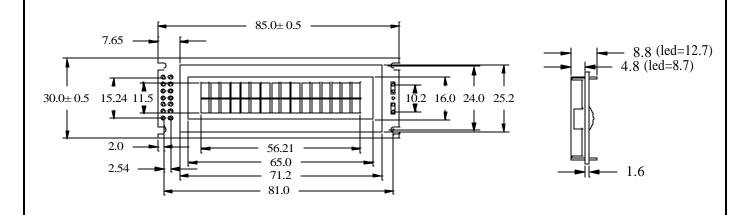




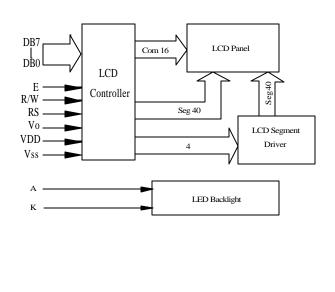
|  | P   | C1602D-L (1                   | 16x2) (     | Chara     | cter   | LCD 1       | Disp                          | lay        |             |           |
|--|---|-------------------------------|-------------|-----------|--------|-------------|-------------------------------|------------|-------------|-----------|
| Features   |   |                               | Abso        | lute Ma   | aximu  | ım Ratiı    | ngs at                        | $T_A = 25$ | C           |           |
| *16 Character  | r, 2 Line   |                               | Item        |           |        |             | mbol                          | Min        | Max         | Unit      |
| *View Angle 1 *TN or STN F                                   |   | Power Supply                  | (Logic)     |           |        | 7           | Vdd                           | -0.3       | 7.0         | V         |
| *Extended Te   | mperature Rang  | ge Power Supply               | (LCD)       |           |        |             | Vo                            | Vdd -0.3   | Vdd 12.0    | V         |
| available *Several Chara                                     | acter Types   | Input Voltage                 |             |           |        |             | Vi                            | - 0.3      | Vdd         | V         |
| available  | • •   | Operating Ten                 | nperature ( | Standard) | )      | Т           | Copr                          | 0          | 50          | °C        |
| *LED or EL B   | acklight available  | Storage Tempo                 |             |           |        | 7           | Γstg                          | - 20       | 70          | °C        |
|  | Extended Operating Temperature                                    |                               |             |           |        |             | Topr                          | - 20       | 70          | °C        |
| Extended Storage Temperatur                                  |   |                               |             |           |        |             | Γstg                          | - 30       | 80          | °C        |
| Electrical Characteristics at T <sub>A</sub> = 25 °C, Vdd=5V |   |                               |             |           |        |             |                               |            |             |           |
|  |   |                               |             |           | 25 °C  |             |                               |            |             | TT '4     |
| Power Supply   | Item (Logic)  | Symbo<br>Vdd-V                |             | Min 4.7   |        | Ty<br>5.    |                               |            | ax<br>.3    | Unit<br>V |
| Supply Curren  |   | Idd                           | 55          | 4.7       |        | 2.          |                               |            | .0          | mA        |
| LCD Driving  |   | Vdd -V                        | <b>'</b> 0  | 4.2       |        | 4.          |                               |            | .8          | V         |
| Input Voltage  |   | Vih                           |             |           |        |             |                               | _          | dd          | V         |
| Input Voltage  |   |                               |             |           | _      | _           |                               | .6         | V           |           |
| Output Voltage   |   | Voh                           |             | 2.4       |        | _           | _                             | _          | _           | V         |
| Output Voltage   | e "L"   | Vol                           |             |           |        | _           | _                             | 0          | .4          | V         |
|  |   | Int                           | terface P   | in Con    | nectio | n           |                               |            |             |           |
| No Symbol  | Function  | 1                             |             | No        | Symbo  | ol          | Functi                        | on         |             |           |
| 1 Vdd  | Power St  | upply (+5V)                   |             | 9         | DB2    |             | Data E                        | Bus Line 2 |             |           |
| 2 Vss  | Power St  | upply (GND)                   |             | 10        | DB3    |             | Data E                        | Bus Line 3 |             |           |
| 3 Vo   | Contrast  | Adjust                        |             | 11        | DB4    |             | Data E                        | Bus Line 4 |             |           |
| 4 RS   |   | on/Register Select            |             | 12        | DB5    |             |                               | Bus Line 5 |             |           |
| 5 R/W  | Read/Wr   |                               |             | 13        | DB6    |             |                               | Bus Line 6 |             |           |
| 6 E  | Enable S  |                               |             | 14        | DB7    |             |                               | Bus Line 7 |             |           |
| 7 DB0  | Data Bus  |                               |             | 15        | A      |             |                               |            | LED Backlig |           |
| 8 DB1  | Data Bus  | s Line 1                      |             | 16        | K      |             | Power                         | Supply for | LED Backlig | ;ht (-)   |
|  | Т   |                               | Backligl    | _         |        |             |                               | 1          |             |           |
|  | Forward Voltage Forward Current Power Dissipation Peak Wavelength |                               |             |           |        |             |                               |            |             |           |
| 4.2V (Typ) 195mA (Max) 900mW (Max) 570nm (Typ)               |   |                               |             |           |        |             |                               |            |             |           |
|  |   | Me                            | chanical    | Specifi   | catior | ıs          |                               |            |             |           |
| Item   | Ove   | rall Size                     |             | g Area    | Cha    | racter Size | Size Character Pitch Dot Size |            | Size        |           |
| Specifications   | 85.0W x 30.0H   | I x 8.8T (BL12.7T)            | 65.0W       | x 16.0H   | 2.96   | W x 5.56H   | H 3.5                         | 5W x 5.94H | 0.56W x     | 0.66H     |
| All dimensions   | are in mm. Tolerance  | is $\pm 0.3$ Unless otherwise | e specified |           |        |             |                               |            |             |           |



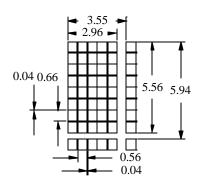
## PC1602D-L (16x2) Character LCD Display



## LCD Block Diagram



## Dot Layout



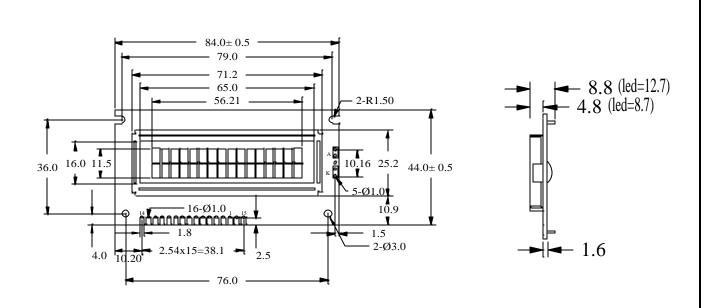


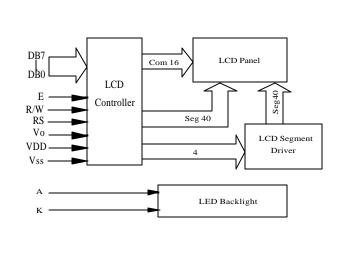
# DC1602EA I (16v2) Ch

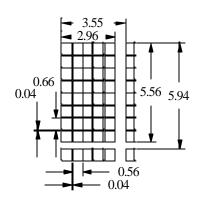
|        |                             | PC                  | C1602         | 2EA-L (                          | 16x2)        | Chara               | acter      | LCD        | Dis     | play                  |             |           |
|--------|-----------------------------|---------------------|---------------|----------------------------------|--------------|---------------------|------------|------------|---------|-----------------------|-------------|-----------|
| Fea    | atures                      |                     |               |                                  | Abso         | lute Ma             | aximu      | ım Rati    | ings at | $T_A = 25$            | °C          |           |
|        | Character                   |                     |               |                                  | Item         | 1                   |            | S          | ymbol   | Min                   | Max         | Unit      |
|        | w Angle 1<br>or STN Fl      |                     | Po            | ower Supply                      | (Logic)      |                     |            |            | Vdd     | -0.3                  | 7.0         | V         |
| *Ext   | tended Te                   | mperature Ran       | ge Po         | ower Supply                      | (LCD)        |                     |            |            | Vo      | Vdd -0.3              | Vdd 12.     | 0 V       |
|        | <b>ilable</b><br>eral Chara | cter Types          | In            | put Voltage                      |              |                     |            |            | Vi      | - 0.3                 | Vdd         | V         |
| avai   | ilable                      |                     | 0             | Operating Temperature (Standard) |              |                     |            | Topr       | 0       | 50                    | °C          |           |
| "LEI   | DOLET P                     | cklight available   |               | torage Tempe                     | erature (Sta | andard)             |            |            | Tstg    | - 20                  | 70          | °C        |
|        |                             |                     | E             | xtended Ope                      | erating Te   | mperatu             | re         |            | Topr    | - 20                  | 70          | °C        |
|        |                             |                     |               | xtended Stor                     | rage Temp    | perature            |            |            | Tstg    | - 30                  | 80          | °C        |
|        |                             | El                  | ectrics       | al Charact                       | eristics :   | at T <sub>1</sub> = | 25 °C.     | . Vdd=     | 5V+0.   | 25V                   |             |           |
|        |                             | Item                |               | Symbo                            |              | Min                 |            |            | Гур     |                       | <b>I</b> ax | Unit      |
| Powe   | er Supply (                 |                     |               | Vdd-Vs                           |              | 4.7                 |            |            | 5.0     |                       | 5.3         | V         |
| Supp   | oly Current                 |                     |               | Idd                              |              | _                   |            | 2          | 2.0     | 4                     | 1.0         | mA        |
| LCD    | Driving V                   | oltage              | e Vdd -Vo 4.2 |                                  |              | 4                   | 4.5        |            | 4.8     |                       |             |           |
| Inpu   | t Voltage "                 | Yih 2.2             |               |                                  |              |                     |            | V          | 'dd     | V                     |             |           |
| Input  | t Voltage "                 | Voltage "L" Vil     |               |                                  | _            |                     |            | _          | (       | ).6                   | V           |           |
| Outp   | out Voltage                 | "H"                 |               | Voh                              |              | 2.4                 |            |            | _       | -                     | _           | V         |
| Outp   | ut Voltage                  | "L"                 |               | Vol                              |              | _                   |            |            | _       | (                     | ).4         | V         |
|        |                             |                     |               | Int                              | erface P     | in Con              | nectio     | n          |         |                       |             |           |
| No     | Symbol                      | Function            | 1             |                                  |              | No                  | Symbo      | ol         | Funct   | ion                   |             |           |
| 1      | Vss                         | Power S             | upply (C      | GND)                             |              | 9                   | DB2        |            | Data I  | Bus Line 2            |             |           |
| 2      | Vdd                         | Power S             |               |                                  |              | 10                  | DB3        |            |         | Bus Line 3            |             |           |
| 3      | Vo                          | Contrast            | -             |                                  |              | 11                  | DB4        |            |         | Bus Line 4            |             |           |
| 4      | RS                          | +                   |               | ster Select                      |              | 12                  | DB5        |            |         | Bus Line 5            |             |           |
| 5<br>6 | R/W<br>E                    | Read/Wi             |               |                                  |              | 13                  | DB6<br>DB7 |            |         | Bus Line 6 Bus Line 7 |             |           |
| 7      | DB0                         | Data Bus            |               | 1                                |              | 15                  | A          |            |         | Supply for            | I ED Book   | light (+) |
| 8      | DB0                         | Data Bus            |               |                                  |              | 16                  | K          |            | +       | Supply for            |             |           |
|        | DDI                         | Batta Bat           | z Eme 1       |                                  | Backligl     |                     |            | one        | 1000    | Supply for            | EED Buck    | ngiit ( ) |
|        | Forward                     | Voltage             | F             | Forward Curre                    |              | _                   |            | Dissipatio | n       | Pe                    | ak Wavelei  | ngth      |
|        | 4.2V (                      | Typ)                |               | 195mA (Max                       | x)           |                     | 900mV      | W (Max)    |         | :                     | 570nm (Ty   | p)        |
|        |                             |                     |               | Me                               | chanical     | Specifi             | cation     | ıs         |         | •                     |             |           |
|        | Item                        | Ove                 | rall Size     |                                  | ı            | ıg Area             |            | racter Siz | ze Cł   | aracter Pitc          | h Do        | ot Size   |
| Spec   | cifications                 | 84.0W x 44.0H       | I x 8.8T      | (BL12.7T)                        | 65.0W        | x 16.0H             | 2.96       | W x 5.56   | 6H 3.5  | 55W x 5.94I           | H 0.56W     | / x 0.66Н |
| All    | dimensions a                | re in mm. Tolerance | is ± 0.3 U    | Inless otherwise                 | specified    |                     |            |            |         |                       |             |           |
|        |                             |                     |               |                                  |              |                     |            |            |         |                       |             |           |



## PC1602EA-L (16x2) Character LCD Display





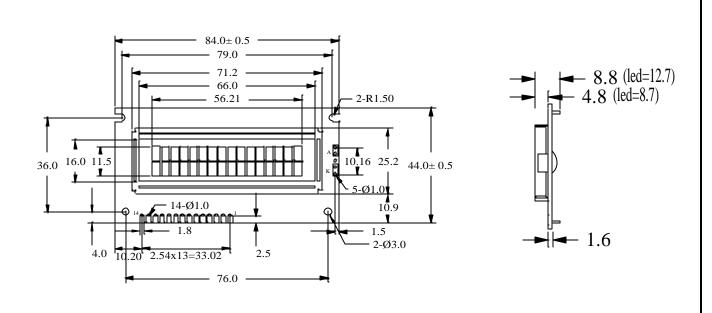




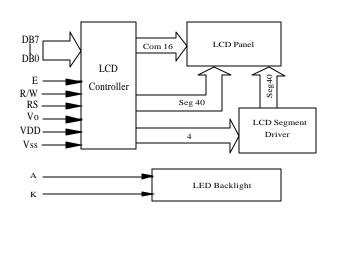
|  |   | P  | C160       | 2E-L (1          | 6x2) C     | Chara      | cter    | LCD :       | Disp     | lay           |            |           |
|--|---|--|------------|------------------|------------|------------|---------|-------------|----------|---------------|------------|-----------|
| Fea  | atures  |  |            |                  | Abso       | lute Ma    | aximu   | ım Rati     | ngs at   | $T_A = 25$    | °C         |           |
| *16  | Character   | , 2 Line   |            |                  | Item       |            |         | Sy          | mbol     | Min           | Max        | Unit      |
|  | w Angle 1<br>or STN Flu   |  | Po         | ower Supply      | (Logic)    |            |         | ,           | Vdd      | -0.3          | 7.0        | V         |
| *Ex  | tended Te   | mperature Rang   | ge Po      | ower Supply      | (LCD)      |            |         |             | Vo       | Vdd -0.3      | Vdd 12.0   | V         |
|  | i <b>ilable</b><br>veral Chara                                    | cter Types   | In         | Input Voltage    |            |            |         | Vi          | - 0.3    | Vdd           | V          |           |
| ava  | ilable  |  | 0          | perating Ten     | perature ( | Standard)  | )       | -           | Горг     | 0             | 50         | °C        |
| *LE  | D or EL Ba  | r EL Backlight available  Storage Temperature (Standard) |            |                  |            | ,          | Tstg    | - 20        | 70       | °C            |            |           |
|  | Extended Operating Temperature                                    |  |            |                  |            |            | Горг    | - 20        | 70       | °C            |            |           |
| Extended Storage Temperature                   |   |  |            |                  |            | +          | Tstg    | - 30        | 80       | °C            |            |           |
| Electrical Characteristics at $T_A = 25$ °C, V |   |  |            |                  |            |            |         |             |          |               |            |           |
|  |   |  | ectrica    |                  |            |            | 25 °C   |             |          |               |            | TT :      |
| Dow  | er Supply (   | Item (Logia)   |            | Symbo<br>Vdd-Vs  |            | Min<br>4.7 |         |             | yp<br>.0 |               | .3         | Unit<br>V |
|  | oly Current   |  |            | Idd              | 55         | 4.7        |         |             | .0       | _             | .0         | mA        |
|  | Driving V   |  |            | Vdd - V          | 2          | 4.2        |         |             | .5       |               | .8         | V         |
|  | t Voltage "   |  |            | Vih 2.2          |            |            |         |             | Vdd      |               | V          |           |
|  | t Voltage "   |  |            |                  |            |            |         | _           |          |               | .6         | V         |
|  | out Voltage   |  |            | Voh              |            | 2.4        |         | _           |          | _             | _          | V         |
|  | out Voltage   |  |            | Vol              |            | _          |         | _           | _        | 0             | .4         | V         |
|  |   |  |            | Int              | erface P   | in Con     | nectio  | n           |          |               | •          |           |
| No   | Symbol  | Function   |            |                  |            | No         | Symbo   |             | Functi   | on            |            |           |
| 1  | Vss   | Power S  | apply (C   | GND)             |            | 9          | DB2     |             | Data I   | Bus Line 2    |            |           |
| 2  | Vdd   | Power S  | apply (+   | -5V)             |            | 10         | DB3     |             | Data I   | Bus Line 3    |            |           |
| 3  | Vo  | Contrast   | Adjust     |                  |            | 11         | DB4     |             | Data I   | Bus Line 4    |            |           |
| 4  | RS  | Instructi  | on/Regi    | ster Select      |            | 12         | DB5     |             | Data I   | Bus Line 5    |            |           |
| 5  | R/W   | Read/Wi  |            |                  |            | 13         | DB6     |             |          | Bus Line 6    |            |           |
| 6  | Е   | Enable S   |            |                  |            | 14         | DB7     |             |          | Bus Line 7    |            |           |
| 7  | DB0   | Data Bus   |            |                  |            | 15         | A       |             |          |               | LED Backli |           |
| 8  | DB1   | Data Bus   | Line 1     |                  |            | 16         | K       |             | Power    | Supply for    | LED Backli | ght (-)   |
|  |   |  |            | LED              | Backligl   | nt Spec    | ificati | ons         |          | ı             |            |           |
|  | Forward Voltage Forward Current Power Dissipation Peak Wavelength |  |            |                  |            |            |         |             |          |               |            |           |
|  | 4.2V (Typ) 195mA (Max) 900mW (Max) 570nm (Typ)                    |  |            |                  |            |            |         |             |          |               |            |           |
|  |   |  |            | Me               | chanical   | Specifi    | cation  | ıs          |          |               |            |           |
|  | Item  | Ove  | rall Size  | ;                | Viewin     | g Area     | Cha     | racter Size | e Ch     | aracter Pitcl | n Dot      | Size      |
| Spec   | cifications   | 84.0W x 44.0H  | x 8.8T     | (BL12.7T)        | 66.0W 2    | x 16.0H    | 2.96    | W x 5.56l   | H 3.5    | 55W x 5.94F   | 0.56W      | x 0.66H   |
| All  | dimensions a  | re in mm. Tolerance                                      | is ± 0.3 U | Inless otherwise | specified  |            |         |             |          |               |            |           |



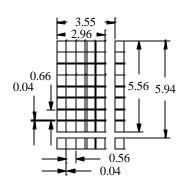
## PC1602E-L (16x2) Character LCD Display



## LCD Block Diagram



## Dot Layout

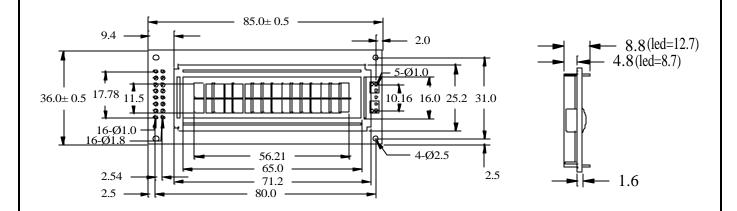




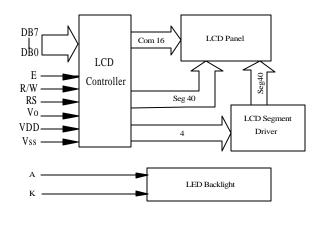
|  |   | P                              | C160       | 2F-L (1          | 6x2) C     | Chara      | cter    | LCD :       | Disp     | lay           |             |           |
|--|---|--------------------------------|------------|------------------|------------|------------|---------|-------------|----------|---------------|-------------|-----------|
| Fea  | atures  |                                |            |                  | Abso       | lute Ma    | aximu   | ım Ratiı    | ngs at   | $T_A = 25$    | C           |           |
| *16  | Character   | , 2 Line                       |            |                  | Item       | l          |         | Sy          | mbol     | Min           | Max         | Unit      |
|  | w Angle 1<br>or STN Fl  |                                | Po         | ower Supply      | (Logic)    |            |         | ,           | Vdd      | -0.3          | 7.0         | V         |
| *Ex  | tended Te   | mperature Rang                 | ge Po      | ower Supply      | (LCD)      |            |         |             | Vo       | Vdd -0.3      | Vdd 12.0    | V         |
|  | i <b>ilable</b><br>veral Chara                                    | cter Types                     | In         | put Voltage      |            |            |         | Vi          | - 0.3    | Vdd           | V           |           |
| ava  | ilable  |                                | 0          | perating Ten     | perature ( | Standard)  | )       | 7           | Горг     | 0             | 50          | °C        |
| *LE  | D or EL Ba  | Storage Temperature (Standard) |            |                  |            | ,          | Γstg    | - 20        | 70       | °C            |             |           |
|  | Extended Operating Temperature                                    |                                |            |                  |            | re         |         | Горг        | - 20     | 70            | °C          |           |
| Extended Storage Temperature                   |   |                                |            |                  |            |            | Γstg    | - 30        | 80       | °C            |             |           |
| Electrical Characteristics at $T_A = 25$ °C, V |   |                                |            |                  |            |            |         |             |          |               |             |           |
|  |   |                                | ectrica    |                  |            |            | 25 °C   |             |          |               |             | TT *      |
| Dow  | er Supply (   | Item (Logic)                   |            | Symbo<br>Vdd-Vs  |            | Min<br>4.7 |         |             | yp<br>.0 |               | .3          | Unit<br>V |
|  | oly Current   |                                |            | Idd              | 55         | 4.7        |         |             | .0       | _             | .0          | mA        |
|  | Driving V   |                                |            | Vdd - V          | 0          | 4.2        |         | 4           |          |               | .8          | V         |
|  | t Voltage "   |                                |            | Vih 2.2          |            |            |         |             |          | dd            | V           |           |
|  | t Voltage "   |                                |            |                  |            |            |         | _           | _        |               | .6          | V         |
|  | out Voltage   |                                |            | Voh              |            | 2.4        |         | _           | _        | _             | _           | V         |
| Outp   | out Voltage   | "L"                            |            | Vol              |            |            |         | _           |          | 0             | .4          | V         |
|  |   |                                |            | Int              | erface P   | in Con     | nectio  | n           |          |               |             |           |
| No   | Symbol  | Function                       |            |                  |            | No         | Symbo   |             | Functi   | on            |             |           |
| 1  | Vss   | Power S                        | apply (C   | GND)             |            | 9          | DB2     |             | Data E   | Bus Line 2    |             |           |
| 2  | Vdd   | Power S                        | apply (+   | -5V)             |            | 10         | DB3     |             | Data E   | Bus Line 3    |             |           |
| 3  | Vo  | Contrast                       | Adjust     |                  |            | 11         | DB4     |             | Data E   | Bus Line 4    |             |           |
| 4  | RS  | Instructi                      | on/Regi    | ster Select      |            | 12         | DB5     |             | Data E   | Bus Line 5    |             |           |
| 5  | R/W   | Read/Wi                        |            |                  |            | 13         | DB6     |             |          | Bus Line 6    |             |           |
| 6  | Е   | Enable S                       |            |                  |            | 14         | DB7     |             |          | Bus Line 7    |             |           |
| 7  | DB0   | Data Bus                       |            |                  |            | 15         | A       |             |          |               | LED Backlig |           |
| 8  | DB1   | Data Bus                       | Line 1     |                  |            | 16         | K       |             | Power    | Supply for    | LED Backli  | ght (-)   |
|  |   |                                |            | LED              | Backligl   | nt Spec    | ificati | ons         |          |               |             |           |
|  | Forward Voltage Forward Current Power Dissipation Peak Wavelength |                                |            |                  |            |            |         |             |          |               |             |           |
|  | 4.2V (Typ) 195mA (Max) 900mW (Max) 570nm (Typ)                    |                                |            |                  |            |            |         |             |          |               |             |           |
|  |   |                                |            | Me               | chanical   | Specifi    | cation  | ıs          |          |               |             |           |
|  | Item  | Ove                            | rall Size  | ;                | Viewin     | g Area     | Cha     | racter Size | e Ch     | aracter Pitcl | n Dot       | Size      |
| Spec   | cifications   | 85.0W x 36.0H                  | x 8.8T     | (BL12.7T)        | 65.0W 2    | x 16.0H    | 2.96    | W x 5.56l   | H 3.5    | 5W x 5.94H    | 0.56W       | x 0.66H   |
| All  | dimensions a  | re in mm. Tolerance            | is ± 0.3 U | Jnless otherwise | specified  |            |         |             |          |               |             |           |



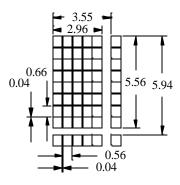
## PC1602F-L (16x2) Character LCD Display



## LCD Block Diagram



#### Dot Layout





# PC1602G-O (16x2) Character LCD Display

#### Features

- \*16 Character, 2 Line
- \*View Angle 12H or 6H
- \*TN or STN Fluid
- \*Extended Temperature Range available
- \*Several Character Types available

| Absolute Maximum Ratings at $T_A = 25$ °C |        |           |          |      |  |  |  |  |
|---|--------|-----------|----------|------|--|--|--|--|
| Item                                      | Symbol | Min       | Max      | Unit |  |  |  |  |
| Power Supply (Logic)                      | Vdd    | -0.3      | 7.0      | V    |  |  |  |  |
| Power Supply (LCD)                        | Vo     | Vdd -15.0 | Vdd +0.3 | V    |  |  |  |  |
| Input Voltage                             | Vi     | - 0.3     | Vdd      | V    |  |  |  |  |
| Operating Temperature (Standard)          | Topr   | 0         | 50       | °C   |  |  |  |  |
| Storage Temperature (Standard)            | Tstg   | - 20      | 70       | °C   |  |  |  |  |
| <b>Extended Operating Temperature</b>     | Topr   | - 20      | 70       | °C   |  |  |  |  |
| <b>Extended Storage Temperature</b>       | Tstg   | - 30      | 80       | °C   |  |  |  |  |

| Electrical Characteristics at $T_A$ : | = 25 °C, | Vdd=5V+0.25V |
|---------------------------------------|----------|--------------|
|---------------------------------------|----------|--------------|

|                      |         | 71  | ,   | •    |      |
|----------------------|---------|-----|-----|------|------|
| Item                 | Symbol  | Min | Тур | Max  | Unit |
| Power Supply (Logic) | Vdd     | 4.5 | 5.0 | 5.5  | V    |
| Supply Current       | Idd     | 2.0 | _   | _    | mA   |
| LCD Driving Voltage  | Vdd -Vo | _   | _   | 13.0 | V    |
| Input Voltage "H"    | Vih     | 2.2 | _   | Vdd  | V    |
| Input Voltage "L"    | Vil     |     |     | 0.6  | V    |
| Output Voltage "H"   | Voh     | 2.4 | _   | _    | V    |
| Output Voltage "L"   | Vol     | _   |     | 0.4  | V    |

| Interfoce  | Din  | Connection     |  |
|------------|------|----------------|--|
| IIIIPIIACE | PIII | T WHILE CHANGE |  |

| No | Symbol | Function                    | No | Symbol | Function                           |
|----|--------|-----------------------------|----|--------|------------------------------------|
| 1  | Vss    | Power Supply (GND)          | 9  | DB2    | Data Bus Line 2                    |
| 2  | Vdd    | Power Supply (+5V)          | 10 | DB3    | Data Bus Line 3                    |
| 3  | Vo     | Contrast Adjust             | 11 | DB4    | Data Bus Line 4                    |
| 4  | RS     | Instruction/Register Select | 12 | DB5    | Data Bus Line 5                    |
| 5  | R/W    | Read/Write                  | 13 | DB6    | Data Bus Line 6                    |
| 6  | Е      | Enable Signal               | 14 | DB7    | Data Bus Line 7                    |
| 7  | DB0    | Data Bus Line 0             | 15 | A      | Power Supply for LED Backlight (+) |
| 8  | DB1    | Data Bus Line 1             | 16 | K      | Power Supply for LED Backlight (-) |

## **LED Backlight Specifications**

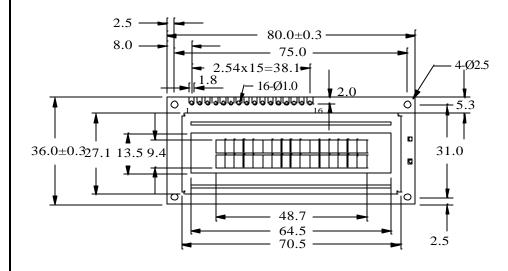
| Forward Voltage | Forward Current | Power Dissipation | Peak Wavelength |
|-----------------|-----------------|-------------------|-----------------|
| 4.2V (Typ)      | 185mA (Typ)     | 777mW (Typ)       | 570nm (Typ)     |

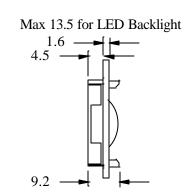
| 3 / I   | • 1  |               | • 📭   | 4 •    |
|---------|------|---------------|-------|--------|
| Mecha   | กบาก | l <b>S</b> no | CITIC | otione |
| VICUITA |      |               |       | autons |

| Item           | Overall Size                   | Viewing Area  | Character Size | Character Pitch | Dot Size     |
|----------------|--------------------------------|---------------|----------------|-----------------|--------------|
| Specifications | 80.0W x 36.0H x 9.2T (BL13.5T) | 64.5W x 13.5H | 2.95W x 4.35H  | 3.05W x 5.05H   | 0.55W x 0.5H |

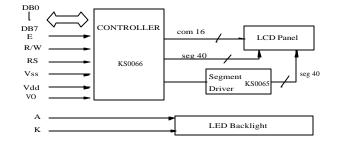


## PC1602G-O (16x2) Character LCD Display

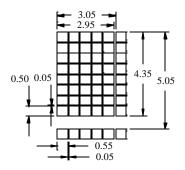




LCD Block Diagram



Dot Layout





# PC1602H-O (16x2) Character LCD Display

#### Features

- \*16 Character, 2 Line
- \*View Angle 12H or 6H
- \*TN or STN Fluid
- \*Extended Temperature Range available
- \*Several Character Types available

| Absolute Maximum Ratings at $T_A = 25$ °C |        |           |          |      |  |  |
|---|--------|-----------|----------|------|--|--|
| Item                                      | Symbol | Min       | Max      | Unit |  |  |
| Power Supply (Logic)                      | Vdd    | -0.3      | 7.0      | V    |  |  |
| Power Supply (LCD)                        | Vo     | Vdd -15.0 | Vdd +0.3 | V    |  |  |
| Input Voltage                             | Vi     | - 0.3     | Vdd      | V    |  |  |
| Operating Temperature (Standard)          | Topr   | 0         | 50       | °C   |  |  |
| Storage Temperature (Standard)            | Tstg   | - 20      | 70       | °C   |  |  |
| <b>Extended Operating Temperature</b>     | Topr   | - 20      | 70       | °C   |  |  |
| Extended Storage Temperature              | Tstg   | - 30      | 80       | °C   |  |  |

| Electrical Characteristics at $T_A = 25$ °C, $Vdd=5V+0.25V$ |         |     |     |      |      |  |  |
|---|---------|-----|-----|------|------|--|--|
| Item  | Symbol  | Min | Тур | Max  | Unit |  |  |
| Power Supply (Logic)  | Vdd     | 4.5 | 5.0 | 5.5  | V    |  |  |
| Supply Current  | Idd     | 2.0 | _   | _    | mA   |  |  |
| LCD Driving Voltage   | Vdd -Vo | _   | _   | 13.0 | V    |  |  |
| Input Voltage "H"   | Vih     | 2.2 | _   | Vdd  | V    |  |  |
| Input Voltage "L"   | Vil     | _   | _   | 0.6  | V    |  |  |
| Output Voltage "H"  | Voh     | 2.4 | _   | _    | V    |  |  |
| Output Voltage "I "   | Vol     |     |     | 0.4  | V    |  |  |

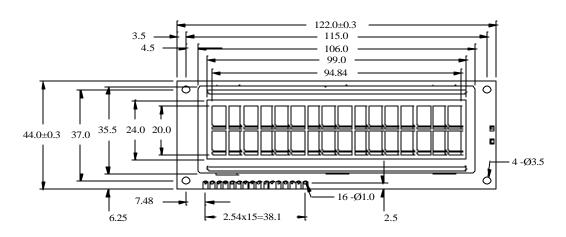
|    | Interface Pin Connection |                             |    |        |                                    |  |  |  |
|----|--------------------------|-----------------------------|----|--------|------------------------------------|--|--|--|
| No | Symbol                   | Function                    | No | Symbol | Function                           |  |  |  |
| 1  | Vss                      | Power Supply (GND)          | 9  | DB2    | Data Bus Line 2                    |  |  |  |
| 2  | Vdd                      | Power Supply (+5V)          | 10 | DB3    | Data Bus Line 3                    |  |  |  |
| 3  | Vo                       | Contrast Adjust             | 11 | DB4    | Data Bus Line 4                    |  |  |  |
| 4  | RS                       | Instruction/Register Select | 12 | DB5    | Data Bus Line 5                    |  |  |  |
| 5  | R/W                      | Read/Write                  | 13 | DB6    | Data Bus Line 6                    |  |  |  |
| 6  | Е                        | Enable Signal               | 14 | DB7    | Data Bus Line 7                    |  |  |  |
| 7  | DB0                      | Data Bus Line 0             | 15 | A      | Power Supply for LED Backlight (+) |  |  |  |
| 8  | DB1                      | Data Bus Line 1             | 16 | K      | Power Supply for LED Backlight (-) |  |  |  |

| LED Backlight Specifications |                 |                   |                 |  |  |  |
|------------------------------|-----------------|-------------------|-----------------|--|--|--|
| Forward Voltage              | Forward Current | Power Dissipation | Peak Wavelength |  |  |  |
| 4.2V (Typ)                   | 355mA (Typ)     | 1500mW (Typ)      | 570nm (Typ)     |  |  |  |
|                              |                 |                   |                 |  |  |  |

| Mechanical Specifications |   |               |                |                 |              |  |  |  |
|---------------------------|---|---------------|----------------|-----------------|--------------|--|--|--|
| Item                      | Overall Size  | Viewing Area  | Character Size | Character Pitch | Dot Size     |  |  |  |
| Specifications            | 122W x 44.0H x 9.2T (BL13.5T)   | 99.0W x 24.0H | 4.84W x 9.66H  | 6.0W x 10.34H   | 0.92W x 1.1H |  |  |  |
| All dimensions a          | All dimensions are in mm. Tolerance is $\pm$ 0.3 Unless otherwise specified |               |                |                 |              |  |  |  |



# PC1602H-O (16x2) Character LCD Display

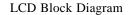


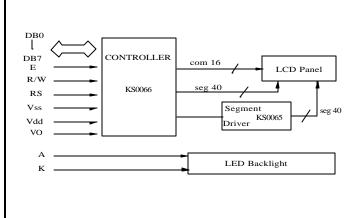
Max 13.5 for LED Backlight

9.2

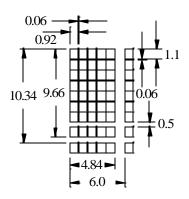
5.5

1.6





## Dot Layout





# PC1602I-O (16x2) Character LCD Display

#### Features

- \*16 Character, 2 Line
- \*View Angle 12H or 6H
- \*TN or STN Fluid
- \*Extended Temperature Range available
- \*Several Character Types available

| Absolute Maximum Ratings at $T_A = 25$ °C |        |           |          |      |  |  |
|---|--------|-----------|----------|------|--|--|
| Item                                      | Symbol | Min       | Max      | Unit |  |  |
| Power Supply (Logic)                      | Vdd    | -0.3      | 7.0      | V    |  |  |
| Power Supply (LCD)                        | Vo     | Vdd -15.0 | Vdd +0.3 | V    |  |  |
| Input Voltage                             | Vi     | - 0.3     | Vdd      | V    |  |  |
| Operating Temperature (Standard)          | Topr   | 0         | 50       | °C   |  |  |
| Storage Temperature (Standard)            | Tstg   | - 20      | 70       | °C   |  |  |
| <b>Extended Operating Temperature</b>     | Topr   | - 20      | 70       | °C   |  |  |
| <b>Extended Storage Temperature</b>       | Tstg   | - 30      | 80       | °C   |  |  |

| Electrical Characteristics at $T_A = 25$ °C, $Vdd=5V+0.25V$ |         |     |     |      |      |  |  |
|---|---------|-----|-----|------|------|--|--|
| Item  | Symbol  | Min | Тур | Max  | Unit |  |  |
| Power Supply (Logic)  | Vdd     | 4.5 | 5.0 | 5.5  | V    |  |  |
| Supply Current  | Idd     | 2.0 | _   |      | mA   |  |  |
| LCD Driving Voltage   | Vdd -Vo | _   | _   | 13.0 | V    |  |  |
| Input Voltage "H"   | Vih     | 2.2 | _   | Vdd  | V    |  |  |
| Input Voltage "L"   | Vil     | _   |     | 0.6  | V    |  |  |
| Output Voltage "H"  | Voh     | 2.4 |     | _    | V    |  |  |
| Output Voltage "L"  | Vol     | _   | _   | 0.4  | V    |  |  |

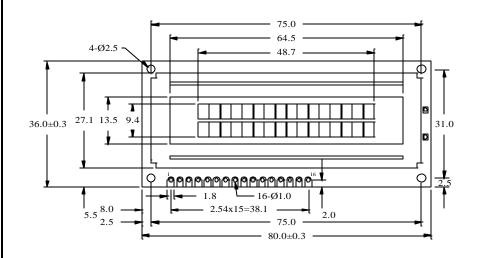
|    | Interface Pin Connection |                             |    |        |                                    |  |  |  |
|----|--------------------------|-----------------------------|----|--------|------------------------------------|--|--|--|
| No | Symbol                   | Function                    | No | Symbol | Function                           |  |  |  |
| 1  | Vss                      | Power Supply (GND)          | 9  | DB2    | Data Bus Line 2                    |  |  |  |
| 2  | Vdd                      | Power Supply (+5V)          | 10 | DB3    | Data Bus Line 3                    |  |  |  |
| 3  | Vo                       | Contrast Adjust             | 11 | DB4    | Data Bus Line 4                    |  |  |  |
| 4  | RS                       | Instruction/Register Select | 12 | DB5    | Data Bus Line 5                    |  |  |  |
| 5  | R/W                      | Read/Write                  | 13 | DB6    | Data Bus Line 6                    |  |  |  |
| 6  | Е                        | Enable Signal               | 14 | DB7    | Data Bus Line 7                    |  |  |  |
| 7  | DB0                      | Data Bus Line 0             | 15 | A      | Power Supply for LED Backlight (+) |  |  |  |
| 8  | DB1                      | Data Bus Line 1             | 16 | K      | Power Supply for LED Backlight (-) |  |  |  |

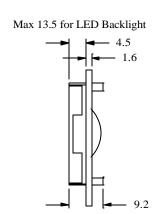
| LED Backlight Specifications |                 |                   |                 |  |  |
|------------------------------|-----------------|-------------------|-----------------|--|--|
| Forward Voltage              | Forward Current | Power Dissipation | Peak Wavelength |  |  |
| 4.2V (Typ)                   | 185mA (Typ)     | 777mW (Typ)       | 570nm (Typ)     |  |  |

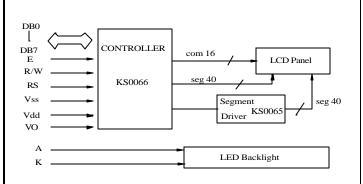
| Mechanical Specifications   |                                |               |                |                 |              |  |  |  |
|---|--------------------------------|---------------|----------------|-----------------|--------------|--|--|--|
| Item  | Overall Size                   | Viewing Area  | Character Size | Character Pitch | Dot Size     |  |  |  |
| Specifications  | 80.0W x 36.0H x 9.2T (BL13.5T) | 64.5W x 13.5H | 2.95W x 4.35H  | 3.05W x 5.05H   | 0.55W x 0.5H |  |  |  |
| All dimensions are in mm. Tolerance is ± 0.3 Unless otherwise specified |                                |               |                |                 |              |  |  |  |

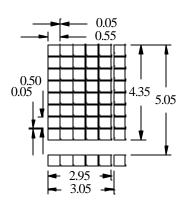


# PC1602I-O (16x2) Character LCD Display







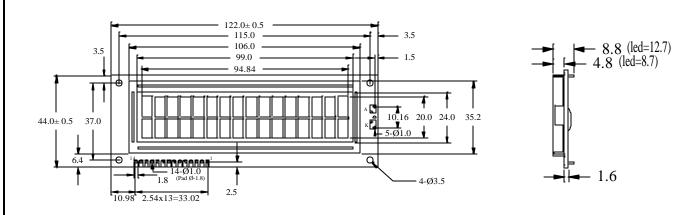




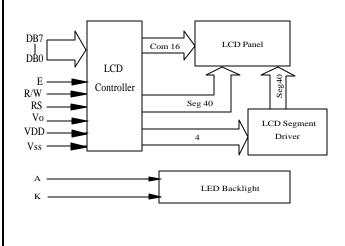
|                   | PC1602J-L (16x2) Character LCD Display |                       |                         |                      |           |          |             |                 |              |             |         |
|-------------------|--|-----------------------|-------------------------|----------------------|-----------|----------|-------------|-----------------|--------------|-------------|---------|
| Fea               | atures                                 |                       |                         | Abso                 | olute M   | aximu    | m Ratir     | ıgs at ˈ        | $T_A = 25$   | °C          |         |
|                   | Character                              |                       |                         | Item                 |           |          | Sy          | mbol            | Min          | Max         | Unit    |
|                   | ew Angle 1<br>or STN Fl                |                       | Power Supply            | Power Supply (Logic) |           |          | 7           | <sup>7</sup> dd | -0.3         | 7.0         | V       |
| *Ex               | tended Te                              | mperature Rang        | e Power Supply          | (LCD)                |           |          | ,           | Vo              | Vdd -0.3     | Vdd 12.0    | V       |
|                   | <b>ailable</b><br>veral Chara          | cter Types            | Input Voltage           | 2                    |           |          |             | Vi              | - 0.3        | Vdd         | V       |
| ava               | ilable                                 |                       | Operating Te            | mperature (          | Standard  | )        | Т           | opr             | 0            | 50          | °C      |
| "LE               | D OF EL B                              | ncklight available    | Storage Temp            | perature (St         | andard)   |          | Т           | `stg            | - 20         | 70          | °C      |
|                   |  |                       | Extended O              | perating Te          | emperatu  | re       | Т           | opr             | - 20         | 70          | °C      |
|                   |  |                       | Extended St             |                      | _         |          |             | stg             | - 30         | 80          | °C      |
|                   |  | Fle                   | ectrical Charac         |                      |           | 25 °C    |             |                 | 5V           |             |         |
|                   |  | Item                  | Symb                    |                      | Min       | <u> </u> | Ту          |                 |              | ax          | Unit    |
| Pow               | er Supply                              |                       | Vdd-V                   |                      | 4.7       |          | 5.          |                 |              | .3          | V       |
|                   | ply Current                            |                       | Idd                     |                      | _         |          | 2.          | 0               | 4            | .0          | mA      |
| LCD               | Driving V                              | oltage                | Vdd -                   | Vo                   | 4.2       |          | 4.          |                 |              | .8          | V       |
| Inpu              | t Voltage "                            | Н"                    | Vih                     |                      | 2.2       |          | _           | _ \             |              | dd          | V       |
| Input Voltage "L" |  |                       | Vil                     |                      | _         |          | _           | _               | 0            | .6          | V       |
| Outp              | out Voltage                            | "H"                   | Voh                     | ı                    | 2.4       |          | _           | _               | _            | _           | V       |
| Outp              | out Voltage                            | "L"                   | Vol                     |                      |           |          | _           | _               | 0            | .4          | V       |
|                   |  |                       | In                      | terface P            | in Con    | nectio   | n           |                 |              |             |         |
| No                | Symbol                                 | Function              |                         |                      | No Symbol |          |             | Functio         | on           |             |         |
| 1                 | Vss                                    | Power Su              | pply (GND)              |                      | 9         | DB2      | Data Br     |                 | Bus Line 2   |             |         |
| 2                 | Vdd                                    |                       | pply (+5V)              |                      | 10        | DB3      |             |                 | us Line 3    |             |         |
| 3                 | Vo                                     | Contrast              |                         |                      | 11        | DB4      |             |                 | us Line 4    |             |         |
| 4                 | RS                                     |                       | on/Register Select      |                      | 12        | DB5      |             |                 | us Line 5    |             |         |
| 5                 | R/W                                    | Read/Wri              |                         |                      | 13        | DB6      |             |                 | us Line 6    |             |         |
| 6                 | Е                                      | Enable Si             |                         |                      | 14        | DB7      |             |                 | us Line 7    |             | •       |
| 7                 | DB0                                    | Data Bus              |                         |                      | 15        | A        |             |                 |              | LED Backlig |         |
| 8                 | DB1                                    | Data Bus              |                         |                      | 16        | K        | l           | Power           | Supply for   | LED Backlig | gnt (-) |
|                   |  | T. 1.                 |                         | ) Backlig            | _         |          |             |                 | _            | 1 ***       |         |
|                   | Forward                                | 0                     | Forward Cur             |                      | P         |          | issipation  |                 |              | ak Waveleng |         |
|                   | 4.2V (                                 | Typ)                  | 390mA (Ma               | ax)                  |           | 1800m    | W (Max)     |                 | 5            | 570nm (Typ) |         |
|                   |  | T                     |                         | echanical            | -         |          |             |                 |              |             |         |
|                   | Item                                   |                       | all Size                |                      | ng Area   |          | racter Size |                 | racter Pitcl |             |         |
| Spec              | cifications                            | 122.0W x 44.0H        | 1 x 8.8T (BL13.0T)      | 99.0W                | x 24.0H   | 4.84     | W x 9.63F   | 6.0 <b>v</b>    | W x 10.37F   | 0.92W 2     | x 1.16H |
| All               | dimensions a                           | re in mm. Tolerance i | s ± 0.3 Unless otherwis | se specified         |           |          |             |                 |              |             |         |



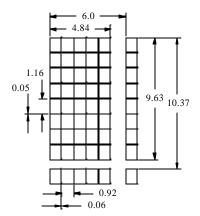
## PC1602J-L (16x2) Character LCD Display



## LCD Block Diagram



## Dot Layout

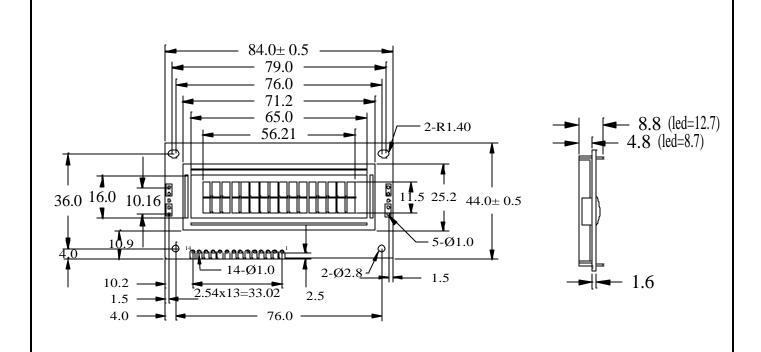




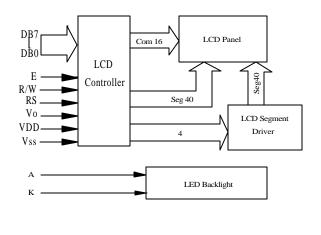
#### PC1602K-L (16x2) Character LCD Display Features Absolute Maximum Ratings at $T_A = 25$ °C \*16 Character, 2 Line Symbol Min Max Unit \*View Angle 12H or 6H V Power Supply (Logic) Vdd -0.3 7.0 \*TN or STN Fluid \*Extended Temperature Range Power Supply (LCD) Vo Vdd - 0.3Vdd 12.0 V available Vi - 0.3 V Input Voltage Vdd \*Several Character Types available Operating Temperature (Standard) Topr 0 50 °C \*LED or EL Backlight available °C 70 Storage Temperature (Standard) Tstg - 20 **Extended Operating Temperature** Topr - 20 70 °C **Extended Storage Temperature** - 30 80 $^{\circ}C$ Tstg Electrical Characteristics at $T_A = 25$ °C, Vdd=5V+0.25VItem Symbol Min Max Unit Тур V Power Supply (Logic) Vdd-Vss 4.7 5.0 5.3 Supply Current Idd 2.0 4.0 mΑ V LCD Driving Voltage Vdd -Vo 4.2 4.5 4.8 Input Voltage "H" Vih 2.2 Vdd V Input Voltage "L" Vil 0.6 V V Output Voltage "H" Voh 2.4 Output Voltage "L" Vol 0.4 V **Interface Pin Connection** Function No Symbol **Function** Symbol DB2 Vss Power Supply (GND) Data Bus Line 2 Data Bus Line 3 2 Vdd Power Supply (+5V) 10 DB3 3 Vo 11 DB4 Data Bus Line 4 Contrast Adjust 4 RS Instruction/Register Select 12 DB5 Data Bus Line 5 R/W 5 Read/Write 13 DB6 Data Bus Line 6 6 Е 14 DB7 Data Bus Line 7 Enable Signal Data Bus Line 0 15 Power Supply for LED Backlight (+) DB0 Α DB1 Data Bus Line 1 16 K Power Supply for LED Backlight (-) **LED Backlight Specifications** Forward Voltage Forward Current Power Dissipation Peak Wavelength 4.2V (Typ) 195mA (Max) 900mW (Max) 570nm (Typ) **Mechanical Specifications** Item Overall Size Viewing Area Character Size Character Pitch Dot Size 84.0W x 44.0H x 8.8T (BL12.7T) 65.0W x 16.0H 2.96W x 5.56H 3.55W x 5.94H 0.56W x 0.66H Specifications All dimensions are in mm. Tolerance is $\pm 0.3$ Unless otherwise specified



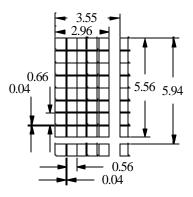
## PC1602K-L (16x2) Character LCD Display



## LCD Block Diagram



## Dot Layout



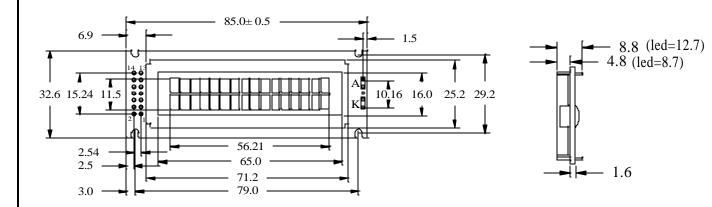


## PC1602L-L (16x2) Character LCD Display

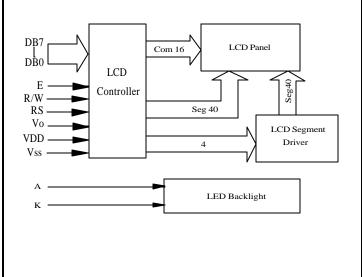
|  | P(                  | C160           | 2L-L (1              | 6x2) (       | Chara     | cter            | LCD I       | Displ    | ay                     |            |          |
|--|---------------------|----------------|----------------------|--------------|-----------|-----------------|-------------|----------|------------------------|------------|----------|
| Features   |                     |                |                      | Abso         | lute Ma   | aximu           | ım Ratir    | ngs at   | $T_A = 25$             | °C         |          |
| *16 Character  |                     |                | Item                 |              |           | Sy              | mbol        | Min      | Max                    | Unit       |          |
| *View Angle 1 *TN or STN Fl  |                     | Po             | Power Supply (Logic) |              |           | 7               | /dd         | -0.3     | 7.0                    | V          |          |
| *Extended Te   | mperature Rang      | ge Po          | Power Supply (LCD)   |              |           |                 | Vo          | Vdd -0.3 | Vdd 12.0               | ) V        |          |
| available *Several Chara   | acter Types         | In             | Input Voltage        |              |           |                 | Vi          | - 0.3    | Vdd                    | V          |          |
| available  | acklight available  | O <sub>l</sub> | perating Tem         | perature (   | Standard) | )               | Т           | `opr     | 0                      | 50         | °C       |
| LED OF LE DO   | ekiigiit avanaoie   |                | orage Tempe          | erature (Sta | andard)   |                 | Г           | Stg      | - 20                   | 70         | °C       |
|  |                     |                | ktended Ope          | erating Te   | mperatu   | re              | Т           | opr      | - 20                   | 70         | °C       |
|  |                     |                |                      | rage Temp    | perature  |                 | Т           | Stg      | - 30                   | 80         | °C       |
| Electrical Characteristics at T <sub>A</sub> = 25 °C, Vdd=5V+0.25V |                     |                |                      |              |           |                 |             |          |                        |            |          |
|  | Item                |                | Symbo                | ol           | Min       |                 | Ту          | /p       | N.                     | Iax        | Unit     |
| Power Supply   | (Logic)             |                | Vdd-Vs               | ss           | 4.7       |                 | 5.          | 0        | 5                      | 5.3        | V        |
| Supply Current   | t                   |                | Idd                  |              | _         |                 | 2.          | 0        | 4                      | 4.0        |          |
| LCD Driving V  | <sup>7</sup> oltage |                | Vdd -Ve              | О            | 4.2       |                 | 4.          | 1.5      |                        | 4.8        |          |
|  | Input Voltage "H"   |                |                      |              | 2.2       |                 | _           | _        |                        | Vdd        |          |
| Input Voltage "L"  |                     |                | Vil                  |              |           |                 | _           | _        | C                      | 0.6        | V        |
| Output Voltage   |                     |                | Voh                  |              | 2.4       |                 | _           | _        | _                      |            | V        |
| Output Voltage   | : "L"               |                | Vol                  |              |           |                 | _           | _        | C                      | ).4        | V        |
|  |                     |                | Int                  | erface P     | in Con    | nectio          | n           |          |                        |            |          |
| No Symbol  |                     |                |                      |              | No        | Symbol Function |             |          |                        |            |          |
| 1 Vss  | Power St            |                |                      |              | 9         |                 |             |          | Bus Line 2             |            |          |
| 2 Vdd  | Power St            |                |                      |              | 10        | DB3             |             |          | ta Bus Line 3          |            |          |
| 3 Vo<br>4 RS   | Contrast            |                | ster Select          |              | 11        | DB4<br>DB5      |             |          | us Line 4<br>us Line 5 |            |          |
| 5 R/W  | Read/Wi             |                | ster Select          |              | 13        | DB3             |             |          | us Line 6              |            |          |
| 6 E  | Enable S            |                |                      |              | 14        | DB0<br>DB7      |             |          | us Line 7              |            |          |
| 7 DB0  | Data Bus            |                |                      |              | 15        | A               |             |          |                        | LED Backl  | ight (+) |
| 8 DB1  | Data Bus            |                |                      |              | 16        | K               |             |          |                        | LED Backl  |          |
| <u>'</u>   |                     |                | LED                  | Backligl     | ht Speci  | ificati         | ons         |          |                        |            |          |
| Forward  | Voltage             | F              | orward Curre         |              |           |                 | Dissipation |          | Pe                     | ak Wavelen | gth      |
| 4.2V   | (Typ)               |                | 195mA (Max           | κ)           |           | 900mV           | W (Max)     |          | 4                      | 570nm (Typ | ))       |
|  |                     |                | Me                   | chanical     | Specifi   | cation          | ns          |          |                        |            |          |
| Item Overall Size Viewing Area Character Size Character Pitch      |                     |                |                      |              | h Do      | t Size          |             |          |                        |            |          |
| Specifications   | 85.0W x 32.6H       | 1 x 8.8T       | (BL12.7T)            | 65.0W        | x 16.0H   | 2.96            | W x 5.56F   | I 3.5    | 5W x 5.94H             | 1 0.56W    | x 0.66H  |
| All dimensions a   | re in mm. Tolerance | is ± 0.3 U     | nless otherwise      | specified    |           |                 |             |          |                        |            |          |



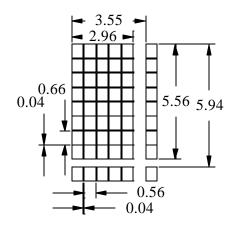
## PC1602L-L (16x2) Character LCD Display



LCD Block Diagram



Dot Layout

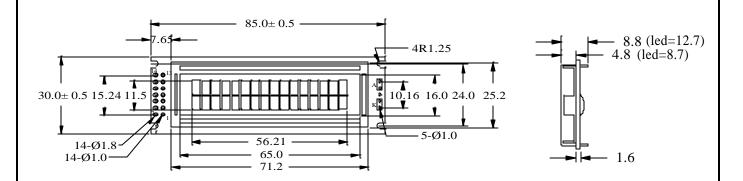




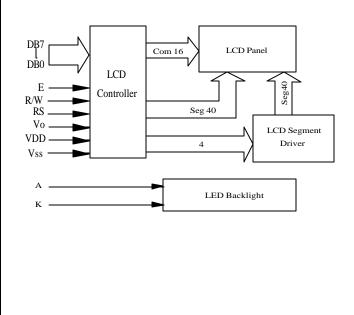
| PC1602M-L (16x2) Character LCD Display |                      |                           |                      |           |            |                       |                         |            |             |         |
|--|----------------------|---------------------------|----------------------|-----------|------------|-----------------------|-------------------------|------------|-------------|---------|
| Features                               |                      |                           | Abso                 | lute Ma   | aximu      | m Ratir               | ıgs at                  | $T_A = 25$ | °C          |         |
| *16 Character                          |                      |                           | Item                 |           |            | Sy                    | mbol                    | Min        | Max         | Unit    |
| *View Angle 1 *TN or STN Fl            |                      | Power Supply              | Power Supply (Logic) |           |            | V                     | <sup>7</sup> dd         | -0.3       | 7.0         | V       |
| *Extended Te                           | mperature Rang       | Power Supply              | (LCD)                |           |            | ,                     | Vo                      | Vdd -0.3   | Vdd 12.0    | V       |
| available *Several Chara               | acter Types          | Input Voltage             |                      |           |            |                       | Vi                      | - 0.3      | Vdd         | V       |
| available                              |                      | Operating Ten             | nperature (          | Standard) | )          | Т                     | opr                     | 0          | 50          | °C      |
| *LED of EL B                           | acklight available   | Storage Tempe             | erature (Sta         | andard)   |            | Т                     | stg                     | - 20       | 70          | °C      |
|  |                      | Extended Ope              |                      |           | re         |                       | opr                     | - 20       | 70          | °C      |
|  |                      | Extended Sto              | _                    | _         |            |                       | `stg                    | - 30       | 80          | °C      |
|  | F14                  | ectrical Charact          |                      |           | 25 °C      |                       | _                       | )5V        |             |         |
|  | Item                 | Symbo                     |                      | Min       | 25 0,      | <b>, vuu=</b> 5<br>Ту |                         |            | lax         | Unit    |
| Power Supply                           |                      | Vdd-Vs                    |                      | 4.7       |            | 5.0                   |                         |            | .3          | V       |
| Supply Current                         |                      | Idd                       |                      |           |            | 2.                    |                         |            | .0          | mA      |
| LCD Driving V                          |                      | Vdd -V                    | o o                  | 4.2       |            | 4.                    |                         |            | 4.8         |         |
| Input Voltage '                        |                      | Vih                       |                      | 2.2       |            | _                     |                         |            | Vdd         |         |
| Input Voltage '                        | 'L''                 | Vil                       |                      | _         |            | _                     | _                       | 0          | .6          | V       |
| Output Voltage                         | e "H"                | Voh                       |                      | 2.4       |            | _                     | -                       | -          | _           | V       |
| Output Voltage                         | e "L"                | Vol                       |                      | _         |            | _                     | _                       | 0          | .4          | V       |
|  |                      | Int                       | terface P            | in Con    | nectio     | n                     |                         |            |             |         |
| No Symbol                              | Function             |                           |                      |           | Symbol     |                       | Functi                  | on         |             |         |
| 1 Vss                                  | Power Su             | apply (GND)               |                      | 9         | DB2 Data B |                       | Bus Line 2              |            |             |         |
| 2 Vdd                                  | Power Su             | ipply (+5V)               |                      | 10        | DB3        | Data Bı               |                         | Bus Line 3 |             |         |
| 3 Vo                                   | Contrast             | Adjust                    |                      | 11        | DB4        |                       | Data B                  | Bus Line 4 |             |         |
| 4 RS                                   | Instruction          | on/Register Select        |                      | 12        | DB5        |                       | Data B                  | Sus Line 5 |             |         |
| 5 R/W                                  | Read/Wr              |                           |                      | 13        | DB6        |                       | Data B                  | sus Line 6 |             |         |
| 6 E                                    | Enable S             | ignal                     |                      | 14        | DB7        |                       | Data B                  | Sus Line 7 |             |         |
| 7 DB0                                  | Data Bus             |                           |                      | 15        | A          |                       |                         |            | LED Backlig |         |
| 8 DB1                                  | Data Bus             | Line 1                    |                      | 16        | K          |                       | Power                   | Supply for | LED Backlig | ght (-) |
|  |                      | LED                       | Backlig              | ht Speci  | fication   | ons                   |                         |            |             |         |
| Forward                                | Voltage              | Forward Curr              | ent                  | P         | ower D     | issipation            |                         | Pea        | ak Waveleng | th      |
| 4.2V                                   | (Typ)                | 195mA (Max                | x)                   |           | 900mV      | V (Max)               |                         | -          | 570nm (Typ) |         |
|  |                      | Me                        | chanical             | Specifi   | cation     | ıs                    |                         |            |             |         |
| Item                                   | Over                 | rall Size                 | Viewin               | ng Area   | Chai       | racter Size           | Size Character Pitch Do |            | n Dot i     | Size    |
| Specifications                         | 85.0W x 30.0H        | x 8.8T (BL12.7T)          | 65.0W                | x 16.0H   | 2.96       | W x 5.56H             | I 3.5                   | 5W x 5.94H | 0.56W x     | х 0.66Н |
| All dimensions a                       | are in mm. Tolerance | is ± 0.3 Unless otherwise | e specified          |           |            |                       |                         |            |             |         |



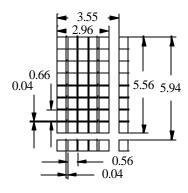
## PC1602M-L (16x2) Character LCD Display



## LCD Block Diagram



## Dot Layout

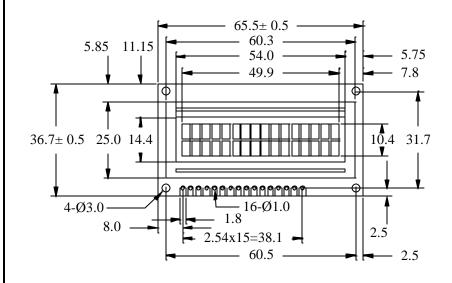


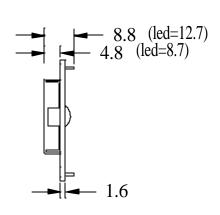


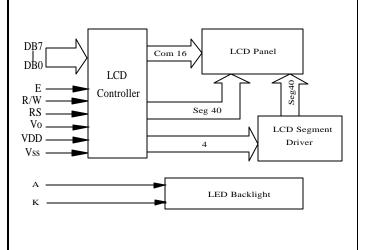
|                   | PC1602N-L (16x2) Character LCD Display |                                       |                        |                      |  |         |             |                 |              |             |         |
|-------------------|--|---------------------------------------|------------------------|----------------------|--|---------|-------------|-----------------|--------------|-------------|---------|
| Fea               | atures                                 |                                       |                        | Abs                  | olute M  | aximu   | ım Ratir    | ıgs at          | $T_A = 25$   | C           |         |
|                   | Character                              |                                       |                        | Item                 |  |         | Sy          | mbol            | Min          | Max         | Unit    |
|                   | w Angle 1<br>or STN Fl                 |                                       | Power Supp             | Power Supply (Logic) |  |         | V           | <sup>7</sup> dd | -0.3         | 7.0         | V       |
| *Ex               | tended Te                              | mperature Rang                        | Power Supp             | Power Supply (LCD)   |  |         | ,           | Vo              | Vdd -0.3     | Vdd 12.0    | V       |
|                   | <b>ilable</b><br>⁄eral Chara           | cter Types                            | Input Volta            | Input Voltage        |  |         |             | Vi              | - 0.3        | Vdd         | V       |
| ava               | ilable                                 |                                       | Operating T            | Temperature          | (Standard)                                       | )       | Т           | opr             | 0            | 50          | °C      |
| "LE               | E                                      |                                       |                        | nperature (S         | tandard)   |         | Т           | `stg            | - 20         | 70          | °C      |
|                   |  |                                       |                        | Operating T          | emperatu   | ire     | Т           | opr             | - 20         | 70          | °C      |
|                   |  |                                       |                        | Storage Ten          |  |         |             | stg             | - 30         | 80          | °C      |
|                   |  | Ele                                   | ectrical Chara         | acteristics          | at T <sub>1</sub> =                              | 25 °C   | Vdd=5       | V+0.2           | 25V          |             |         |
|                   |  | Item                                  | Syn                    |                      | Min  |         | Ту          |                 |              | ax          | Unit    |
| Pow               | er Supply (                            |                                       | Vdd-                   |                      | 4.7  |         | 5.0         |                 |              | .3          | V       |
| Supp              | oly Current                            | · · · · · · · · · · · · · · · · · · · | Id                     | ld                   | _  |         | 2.          | 0               | 4            | .0          | mA      |
| LCD               | Driving V                              | oltage o                              | Vdd                    | -Vo                  | 4.2  |         | 4           | 4.5             |              | .8          | V       |
| Inpu              | t Voltage "                            | H"                                    | V                      | ih                   | 2.2  |         | _           |                 |              | dd          | V       |
| Input Voltage "L" |  |                                       | V                      | il                   | _  |         | _           | -               | 0            | .6          | V       |
| Outp              | out Voltage                            | "H"                                   | Vo                     | oh                   | 2.4  |         | _           | _               | _            | _           | V       |
| Outp              | out Voltage                            | "L"                                   | V                      | ol                   |  |         |             | _               | 0            | .4          | V       |
|                   |  |                                       | ]                      | Interface l          | Pin Con  | nectio  | n           |                 |              |             |         |
| No                | Symbol                                 | Function                              |                        |                      | No Symbol  |         |             | Function        | on           |             |         |
| 1                 | Vss                                    | Power Su                              | ipply (GND)            |                      | 9  | DB2     | DB2 Data Bu |                 | Bus Line 2   |             |         |
| 2                 | Vdd                                    |                                       | ipply (+5V)            |                      | 10   | DB3     |             |                 | us Line 3    |             |         |
| 3                 | Vo                                     | Contrast                              |                        |                      | 11   | DB4     |             |                 | us Line 4    |             |         |
| 4                 | RS                                     |                                       | on/Register Selec      | t                    | 12   | DB5     |             |                 | us Line 5    |             |         |
| 5                 | R/W                                    | Read/Wr                               |                        |                      | 13   | DB6     |             |                 | us Line 6    |             |         |
| 6                 | Е                                      | Enable S                              |                        |                      | 14   | DB7     |             |                 | us Line 7    |             |         |
| 7                 | DB0                                    | Data Bus                              |                        |                      | 15   | A       |             |                 |              | LED Backlig |         |
| 8                 | DB1                                    | Data Bus                              | Line 1                 |                      | 16   | K       |             | Power           | Supply for   | LED Backliş | ght (-) |
|                   |  |                                       |                        | D Backlig            | <del>*                                    </del> |         |             |                 | T            |             |         |
|                   | Forward                                |                                       | Forward C              |                      | P  |         | Dissipation |                 |              | ık Waveleng |         |
|                   | 4.2V (                                 | (Typ)                                 | mA (Ma                 | ax)                  |  | mW      | (Max)       |                 | 5            | 570nm (Typ) |         |
|                   |  |                                       | N                      | <b>Aechanica</b>     | ıl Specifi                                       | ication | ıs          |                 |              |             |         |
|                   | Item                                   | Over                                  | all Size               | View                 | ing Area   | Cha     | racter Size | Cha             | racter Pitcl | n Dot s     | Size    |
| Spec              | cifications                            | 65.5W x 36.7H                         | x 9.6T (BL12.77        | τ) 54.0W             | x 14.4H  | 2.55    | W x 4.99H   | I 3.10          | 6W x 5.41H   | 0.47W 2     | с 0.58H |
| All               | dimensions a                           | re in mm. Tolerance                   | is ± 0.3 Unless otherv | wise specified       |  |         |             |                 |              |             |         |

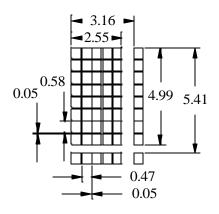


## PC1602N-L (16x2) Character LCD Display











0.4

# PC1602O-O (16x2) Character LCD Display

#### Features

- \*16 Character, 2 Line
- \*View Angle 12H or 6H
- \*TN or STN Fluid

Output Voltage "L"

- \*Extended Temperature Range available
- \*Several Character Types available

| Absolute Maximum Ratings at $T_A = 25$ °C |        |           |          |      |  |  |  |
|---|--------|-----------|----------|------|--|--|--|
| Item                                      | Symbol | Min       | Max      | Unit |  |  |  |
| Power Supply (Logic)                      | Vdd    | -0.3      | 7.0      | V    |  |  |  |
| Power Supply (LCD)                        | Vo     | Vdd -15.0 | Vdd +0.3 | V    |  |  |  |
| Input Voltage                             | Vi     | - 0.3     | Vdd      | V    |  |  |  |
| Operating Temperature (Standard)          | Topr   | 0         | 50       | °C   |  |  |  |
| Storage Temperature (Standard)            | Tstg   | - 20      | 70       | °C   |  |  |  |
| <b>Extended Operating Temperature</b>     | Topr   | - 20      | 70       | °C   |  |  |  |
| Extended Storage Temperature              | Tstg   | - 30      | 80       | °C   |  |  |  |

| Electrical Characteristics at $T_A = 25$ °C, $Vdd=5V+0.25V$ |         |     |     |      |      |  |  |  |  |
|---|---------|-----|-----|------|------|--|--|--|--|
| Item  | Symbol  | Min | Тур | Max  | Unit |  |  |  |  |
| Power Supply (Logic)  | Vdd     | 4.5 | 5.0 | 5.5  | V    |  |  |  |  |
| Supply Current  | Idd     | 2.0 | _   | _    | mA   |  |  |  |  |
| LCD Driving Voltage   | Vdd -Vo | _   | _   | 13.0 | V    |  |  |  |  |
| Input Voltage "H"   | Vih     | 2.2 | _   | Vdd  | V    |  |  |  |  |
| Input Voltage "L"   | Vil     | _   | _   | 0.6  | V    |  |  |  |  |
| Output Voltage "H"  | Voh     | 2.4 | _   | _    | V    |  |  |  |  |

Vol

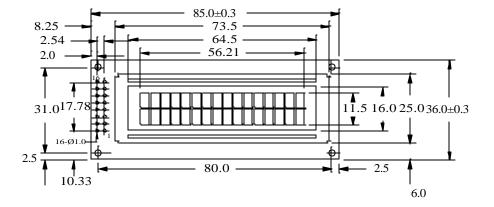
|    | Interface Pin Connection |                             |    |        |                                    |  |  |  |  |
|----|--------------------------|-----------------------------|----|--------|------------------------------------|--|--|--|--|
| No | Symbol                   | Function                    | No | Symbol | Function                           |  |  |  |  |
| 1  | Vss                      | Power Supply (GND)          | 9  | DB2    | Data Bus Line 2                    |  |  |  |  |
| 2  | Vdd                      | Power Supply (+5V)          | 10 | DB3    | Data Bus Line 3                    |  |  |  |  |
| 3  | Vo                       | Contrast Adjust             | 11 | DB4    | Data Bus Line 4                    |  |  |  |  |
| 4  | RS                       | Instruction/Register Select | 12 | DB5    | Data Bus Line 5                    |  |  |  |  |
| 5  | R/W                      | Read/Write                  | 13 | DB6    | Data Bus Line 6                    |  |  |  |  |
| 6  | Е                        | Enable Signal               | 14 | DB7    | Data Bus Line 7                    |  |  |  |  |
| 7  | DB0                      | Data Bus Line 0             | 15 | A      | Power Supply for LED Backlight (+) |  |  |  |  |
| 8  | DB1                      | Data Bus Line 1             | 16 | K      | Power Supply for LED Backlight (-) |  |  |  |  |

| LED Backlight Specifications |                 |                   |                 |  |  |  |  |  |
|------------------------------|-----------------|-------------------|-----------------|--|--|--|--|--|
| Forward Voltage              | Forward Current | Power Dissipation | Peak Wavelength |  |  |  |  |  |
| 4.2V (Typ)                   | 170mA (Typ)     | 720mW (Typ)       | 570nm (Typ)     |  |  |  |  |  |

|                | Mechanical Specifications      |               |                |                 |               |  |  |  |  |  |  |
|----------------|--------------------------------|---------------|----------------|-----------------|---------------|--|--|--|--|--|--|
| Item           | Overall Size                   | Viewing Area  | Character Size | Character Pitch | Dot Size      |  |  |  |  |  |  |
| Specifications | 85.0W x 36.0H x 9.2T (BL13.5T) | 64.5W x 16.0H | 2.96W x 5.56H  | 3.55W x 5.94H   | 0.56W x 0.66H |  |  |  |  |  |  |
|                |                                | 1.01          |                |                 |               |  |  |  |  |  |  |

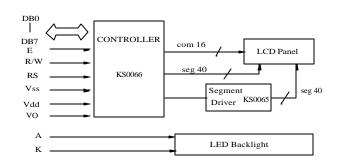


## PC1602O-O (16x2) Character LCD Display

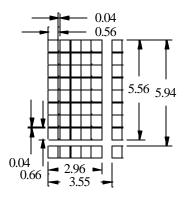


Max 13.5 for LED Backlight
9.2
4.5

#### LCD Block Diagram



#### Dot Layout





## PC1602P-O (16x2) Character LCD Display

#### Features

- \*16 Character, 2 Line
- \*View Angle 12H or 6H
- \*TN or STN Fluid
- \*Extended Temperature Range available
- \*Several Character Types available

| Absolute Maximum Ratings at $T_A = 25 ^{\circ}\text{C}$ |        |           |          |      |  |  |  |  |
|---|--------|-----------|----------|------|--|--|--|--|
| Item  | Symbol | Min       | Max      | Unit |  |  |  |  |
| Power Supply (Logic)                                    | Vdd    | -0.3      | 7.0      | V    |  |  |  |  |
| Power Supply (LCD)                                      | Vo     | Vdd -15.0 | Vdd +0.3 | V    |  |  |  |  |
| Input Voltage   | Vi     | - 0.3     | Vdd      | V    |  |  |  |  |
| Operating Temperature (Standard)                        | Topr   | 0         | 50       | °C   |  |  |  |  |
| Storage Temperature (Standard)                          | Tstg   | - 20      | 70       | °C   |  |  |  |  |
| <b>Extended Operating Temperature</b>                   | Topr   | - 20      | 70       | °C   |  |  |  |  |
| <b>Extended Storage Temperature</b>                     | Tstg   | - 30      | 80       | °C   |  |  |  |  |

## Electrical Characteristics at $T_A = 25$ °C, Vdd=5V+0.25V

|                      |         |     | /   |      |      |
|----------------------|---------|-----|-----|------|------|
| Item                 | Symbol  | Min | Тур | Max  | Unit |
| Power Supply (Logic) | Vdd     | 4.5 | 5.0 | 5.5  | V    |
| Supply Current       | Idd     | 2.0 | _   |      | mA   |
| LCD Driving Voltage  | Vdd -Vo | _   | _   | 13.0 | V    |
| Input Voltage "H"    | Vih     | 2.2 | _   | Vdd  | V    |
| Input Voltage "L"    | Vil     | _   | _   | 0.6  | V    |
| Output Voltage "H"   | Voh     | 2.4 | _   | _    | V    |
| Output Voltage "L"   | Vol     | _   | _   | 0.4  | V    |

## **Interface Pin Connection**

| No | Symbol | Function                    | No | Symbol | Function                           |
|----|--------|-----------------------------|----|--------|------------------------------------|
| 1  | Vss    | Power Supply (GND)          | 9  | DB2    | Data Bus Line 2                    |
| 2  | Vdd    | Power Supply (+5V)          | 10 | DB3    | Data Bus Line 3                    |
| 3  | Vo     | Contrast Adjust             | 11 | DB4    | Data Bus Line 4                    |
| 4  | RS     | Instruction/Register Select | 12 | DB5    | Data Bus Line 5                    |
| 5  | R/W    | Read/Write                  | 13 | DB6    | Data Bus Line 6                    |
| 6  | Е      | Enable Signal               | 14 | DB7    | Data Bus Line 7                    |
| 7  | DB0    | Data Bus Line 0             | 15 | A      | Power Supply for LED Backlight (+) |
| 8  | DB1    | Data Bus Line 1             | 16 | K      | Power Supply for LED Backlight (-) |

## **LED Backlight Specifications**

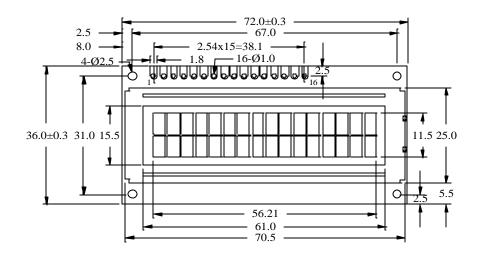
| Forward Voltage | Forward Current | Power Dissipation | Peak Wavelength |
|-----------------|-----------------|-------------------|-----------------|
| 4.2V (Typ)      | 165mA (Typ)     | 693mW (Typ)       | 570nm (Typ)     |

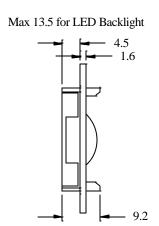
## **Mechanical Specifications**

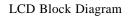
| Item           | Overall Size                   | Viewing Area  | Character Size | Character Pitch | Dot Size      |
|----------------|--------------------------------|---------------|----------------|-----------------|---------------|
| Specifications | 72.0W x 36.0H x 9.2T (BL13.5T) | 61.0W x 15.5H | 2.96W x 5.56H  | 3.55W x 5.94H   | 0.56W x 0.66H |

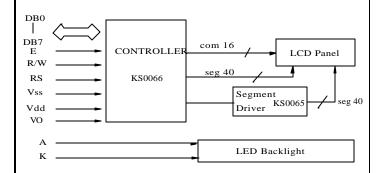


## PC1602P-O (16x2) Character LCD Display









Dot Layout

