

ME DISPLAYS

SPECIFICATIONS

FOR

LCD MODULE

SC2004C

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• FEATURES

| | |
|----------------------|----------------------------|
| Number of Characters | 20 characters x 4 lines |
| Display Font | 5 x 7 dots with Cursor |
| Built-in Controller | HD44780 or Comp |
| Input Data | 4 Bits or 8-Bits Interface |
| Power Supply | +5 V Single Power |
| Duty Cycle | 1/16 Duty |
| Options | EL/LED Backlight, TN/STN |

• MECHANICAL PARAMETERS

| | |
|--------------------------------|---------------------------|
| Module Size | 118.0W x 43.0H x 8.8T mm |
| Module Size with LED Backlight | 118.0W x 43.0H x 12.7T mm |
| Viewing Area Size | 77.0W x 26.3H mm |
| Dot Size | 0.55 x 0.55 mm |
| Dot Pitch | 0.60 x 0.60 mm |

• ABSOLUTE MAXIMUM

| Item | Symbol | Min. | Max | Unit |
|----------------------------|--------|----------|---------|------|
| Power Supply for Logic | Vdd | -0.3 | +7.0 | V |
| Power Supply for LCD Drive | Vlcd | Vdd-11.5 | Vdd+0.3 | V |
| Input Voltage | Vi | -0.3 | Vdd+0.3 | V |
| Operating Temperature | Ta | 0 | +50 | C |
| Storage Temperature | Tstg | -10 | +70 | C |

• ELECTRICAL CHARACTERISTICS

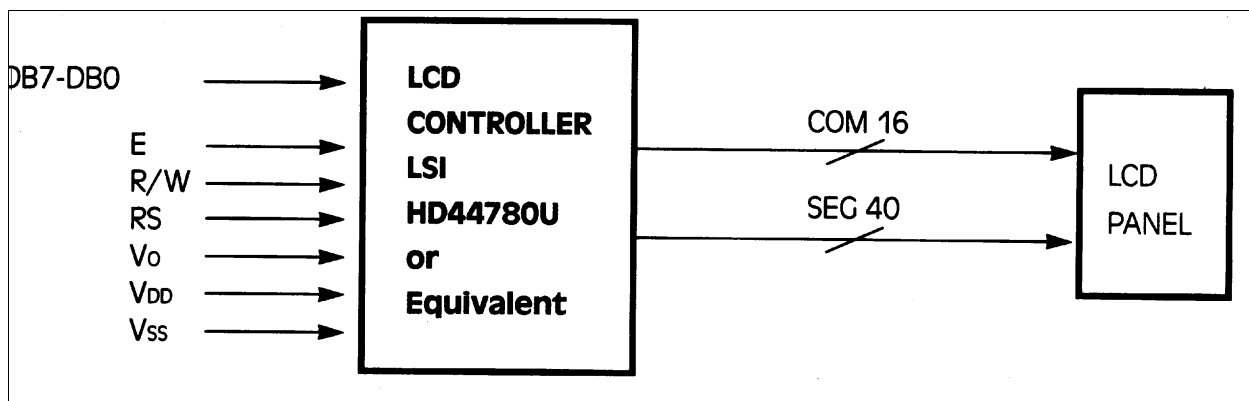
(Vdd=5.0V ± 5%, Ta=25C)

| Item | Symbol | Conditions | Min | Typ | Max | U |
|------------------------|--------|---------------|------|-----|-----|----|
| Power Supply for Logic | Vdd | - | 4.5 | -- | 5.5 | V |
| Op. Voltage for LCD | Vdd-Vo | - | - | 5.0 | - | V |
| Input "High" Voltage | Vih | - | 2.2 | - | Vdd | V |
| Input "Low" Voltage | Vil | - | -0.3 | - | 0.6 | V |
| Output "High" Voltage | Voh | - Ioh = 0.2mA | 2.4 | - | - | V |
| Output "Low" Voltage | Vol | Iol = 1.2mA | - | - | 0.4 | V |
| Power Supply Current | Idd | Vdd = 5.0V | - | - | 3.0 | mA |

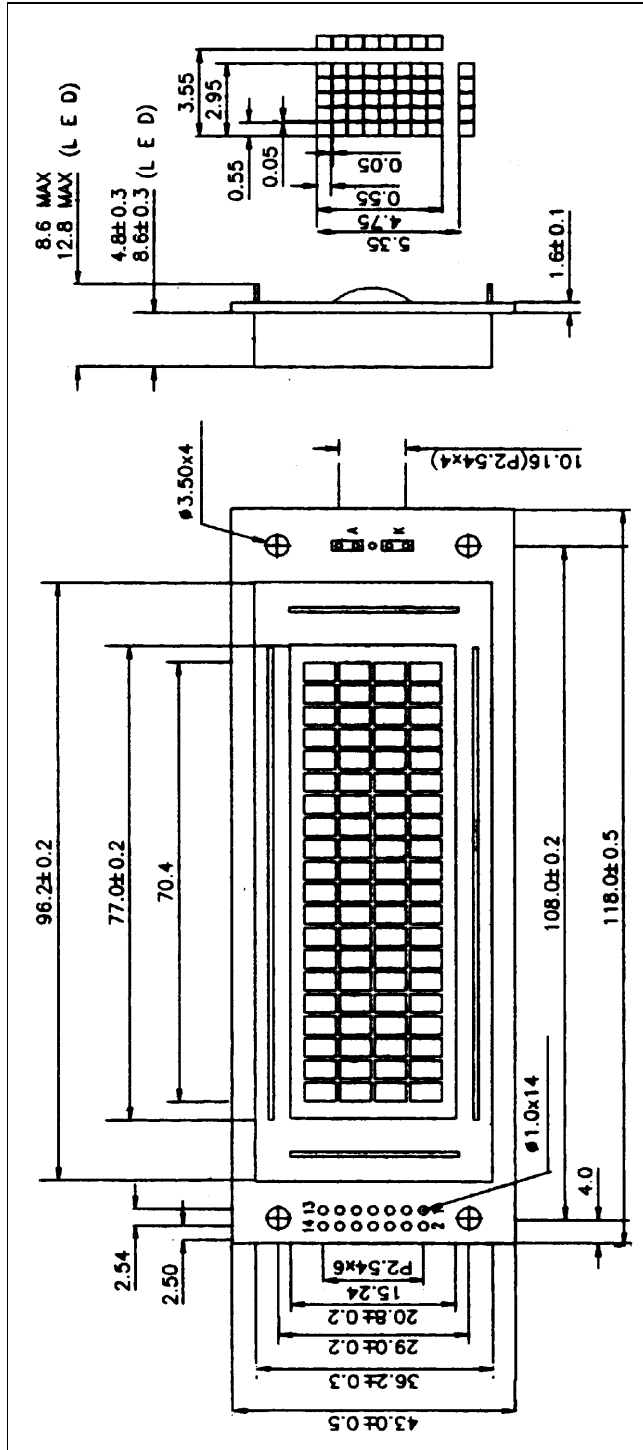
• **PIN ASSIGNMENT**

| No. | Symbol | Level | Pin Description | Function |
|-----|--------|--------|--------------------------|------------------------------|
| 1 | Vss | -- | Ground | 0V |
| 2 | Vdd | -- | Supply Voltage for Logic | 5V |
| 3 | Vo | -- | LCD Contrast Adjust | By User |
| 4 | RS | H/L | Register Select | H: Data, L: Instruction Code |
| 5 | R/W | H/L | Read / Write | H: Data Read, L: Data Write |
| 6 | E | H, H→L | Enable | Enable Signal |
| 7 | DB0 | H/L | Data Bit 0 | 8-Bit Interface |
| 8 | DB1 | H/L | Data Bit 1 | 8-Bit Interface |
| 9 | DB2 | H/L | Data Bit 2 | 8-Bit Interface |
| 10 | DB3 | H/L | Data Bit 3 | 8-Bit Interface |
| 11 | DB4 | H/L | Data Bit 4 | 4 or 8-Bit Interface |
| 12 | DB5 | H/L | Data Bit 5 | 4 or 8-Bit Interface |
| 13 | DB6 | H/L | Data Bit 6 | 4 or 8-Bit Interface |
| 14 | DB7 | H/L | Data Bit 7 | 4 or 8-Bit Interface |

• **BLOCK DIAGRAM**



• DIAGRAM SC2004C



- ENVIRONMENTAL CONDITIONS**

| Item | Operating | | Non-Operating | | Remarks |
|---------------------|------------------|------|---------------|------|---------------------------|
| | Min | Max | Min | Max | |
| Ambient Temperature | 0°C | 50°C | -20°C | 70°C | Normal Temperature Type |
| (Ta) | -20°C | 70°C | -30°C | 80°C | Extended Temperature Type |
| Vibration | -- | 0.5G | -- | 2G | G=9.8 m/s ² |
| Shock | -- | 3G | -- | 50G | XYZ Directions |
| Corrosion Gas | No Corrosion Gas | | | | |

- OPTICAL CHARACTERISTICS**

TN TYPE

| Item | Symbol | Condition | Min | Typ | Max | Unit |
|----------------------|--------|---------------|-----|-----|-----|------|
| Viewing Angle | Ø2-Ø1 | K=1.4 | 20 | -- | -- | Deg |
| Contrast Ratio | K | Ø=25° θ=0° | -- | 3 | -- | -- |
| Response Time (Rise) | tr | Ø=25° θ=0° | -- | 200 | 250 | ms |
| Response Time (Fall) | tf | Ø=25° θ=0° | -- | 200 | 300 | ms |

STN TYPE

| Item | Symbol | Condition | Min | Typ | Max | Unit |
|----------------------|--------|---------------|-----|-----|-----|------|
| Viewing Angle | Ø2-Ø1 | K=1.4 | 40 | -- | -- | Deg |
| Contrast Ratio | K | Ø=25° θ=0° | 3 | -- | -- | -- |
| Response Time (Rise) | tr | Ø=25° θ=0° | -- | 200 | 300 | ms |
| Response Time (Fall) | tf | Ø=25° θ=0° | -- | 250 | 350 | ms |

• **BACKLIGHT CHARACTERISTICS**

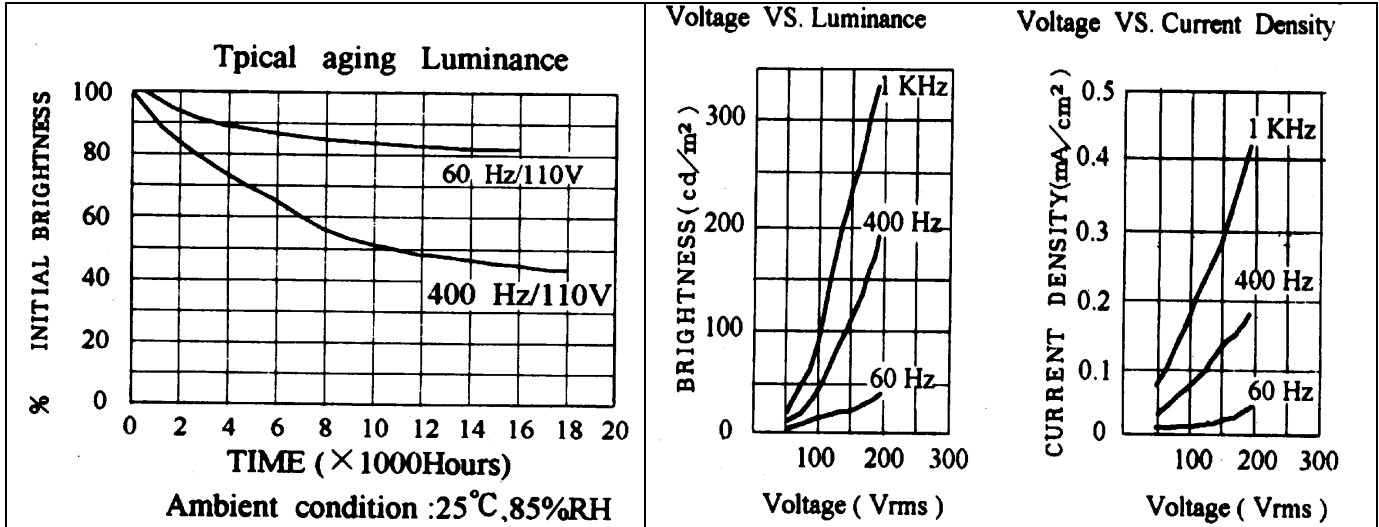
EL BACKLIGHT

Luminous Intensity : 60 cd/m²

Power Consumption : ~0.17 mA/cm²

Driving Condition : 150 Vrms AC Max 50~1000 Hz

Life : 2K Hours (Normal Type), 8K Hours (Long Life Type)



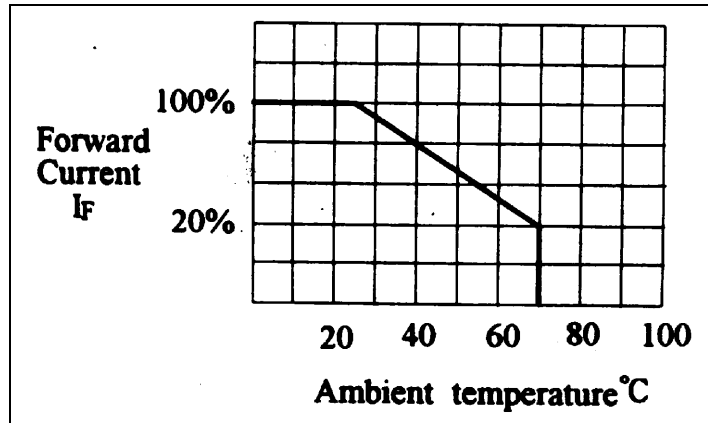
LED BACKLIGHT

Low Voltage Driving (DC) is available without inverter

No noise occurrence

Luminous Intensity : 50 cd/m²

Life : 20K Hours



• AC CHARACTERISTICS

| Item | Symbol | Min | Max | Unit |
|-----------------------------|------------------|-----------|-----|------|
| Enable Cycle Time | T_{CYCE} | 500 | -- | ns |
| Enable Pulse Width | High Level | PW_{EH} | -- | ns |
| Enable Rise/Fall Time | t_{Er}, t_{Ef} | -- | 20 | ns |
| Address Set-up Time | RS, R/W to E | t_{AS} | -- | ns |
| Address Hold Time | | t_{AH} | -- | ns |
| Data Set-up Time | | t_{DSW} | -- | ns |
| Data Delay Time | | t_{DDR} | 160 | ns |
| Data Hold Time (Writing) | | t_H | -- | ns |
| Data Hold Time (Reading) | | t_{DHR} | -- | ns |
| Clock Oscillation Frequency | f_{OSC} | 270 (TYP) | | KHz |

• TIMING CHARACTERISTICS

