

# *ME* DISPLAYS

**SPECIFICATIONS**

**FOR**

**LCD MODULE**

**SC1602D**

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## • FEATURES

Number of Characters	16 characters x 2 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	85.0W x 36.0H x 8.8T mm
Module Size with LED Backlight	85.0W x 36.0H x 12.7T mm
Viewing Area Size	66.0W x 16.0H mm
Dot Size	0.56 x 0.66 mm
Dot Pitch	0.60 x 0.70 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

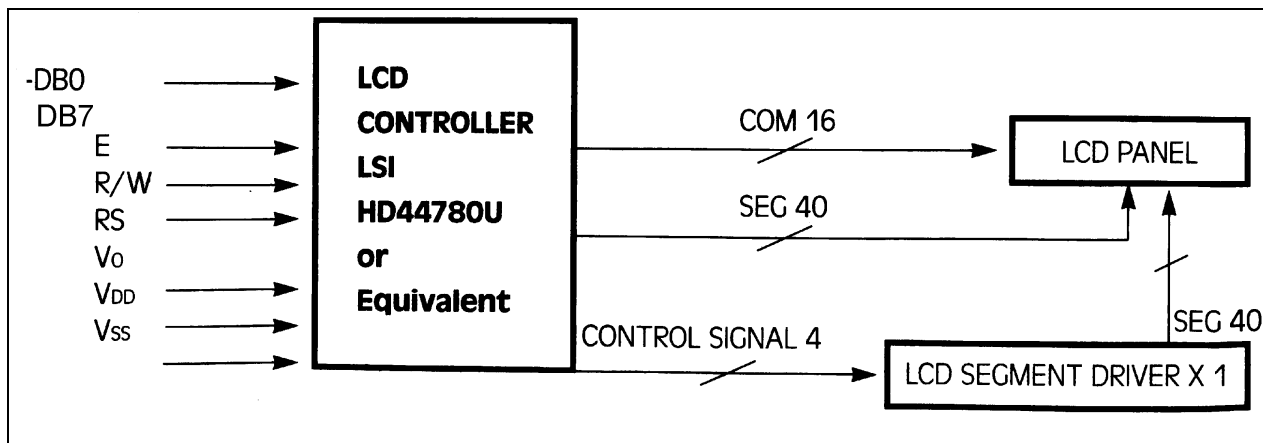
(Vdd=5.0V ± 5%, Ta=25C)

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
15	A	--	LED Backlight	Power Supply for Backlight
16	K	--	LED Backlight	Power Supply for Backlight

• BLOCK DIAGRAM





- 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 <sup>2</sup>
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**

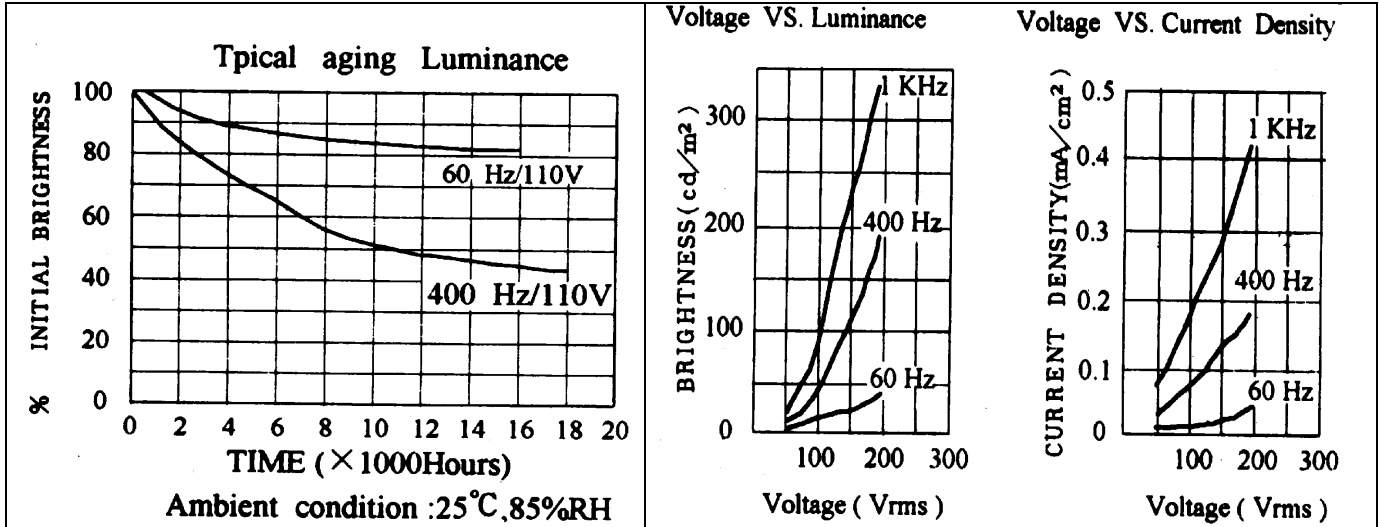
**EL BACKLIGHT**

Luminous Intensity : 60 cd/m<sup>2</sup>

Power Consumption : ~0.17 mA/cm<sup>2</sup>

Driving Condition : 150 Vrms AC Max 50~1000 Hz

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



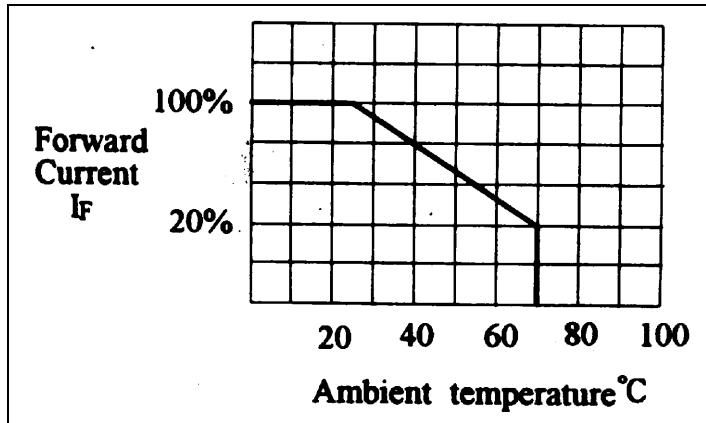
**LED BACKLIGHT**

Low Voltage Driving (DC) is available without inverter

No noise occurrence

Luminous Intensity : 50 cd/m<sup>2</sup>

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

