Technical Specifications of 240 x 64 Pixels Graphic LCD Module

REVISION 'A'
DATE: 20, DEC., 1997.

1. General:

LAMPEX LCD Module Model No. LG240641SGBC, is a complete LCD Module including Printed Circuit Board, with driver circuitry of LCD Drivers built in along with discrete components for driving the Liquid Crystal Display forming an Graphic LCD Module to display the Graphic Information in 240 Pixels in horizontally and 64 Pixels in vertically.

This Module is builtup of High Contrast Super Twisted Neumatic (STN) LCD panel with wide viewing angle. The Viewing Angle & Contrast can be adjusted as shown in the figure mentioned in the specifications.

2. General Specifications:

- **Order Code No: LG240641SGBC\SYBC**
- Graphic LCD Module
- 240 Dots Pixels x 64 Dot Pizels
- STN, Reflective, Positive Type
- Anti-glare & UV Protected Poloriser, Hard Coated.
- View Angle 6'Clock (Bottom View)
- Metal Frame (Plated Zinc - White / Black)

3. Mechanical Specifications:

-	Module Size	180.0 mm x 72.0 mm
-	Viewing Area	132.6 mm x 39.0 mm
-	Pixels Area	127.15 mm x 33.87 mm
-	Dot Size	0.48 mm x 0.48 mm
-	Dot Space	0.05 mm

4. Electrical Requirements:

4.1 Absolute Max. Ratings

Item	Symbol	Min.	Typ.	Max.	Unit	Remarks
Operating Temperature	Top	-10	-	+60	° C	
Storage Temperature	Tst	-20	-	+70	° C	
Humidity	RH	-	-	90 %	%RH	**Vss=0 V**
Power Supply Voltage	Vdd	0	-	6 .0	V	
Input Voltage	Vi	Vss	-	Vdd	V	

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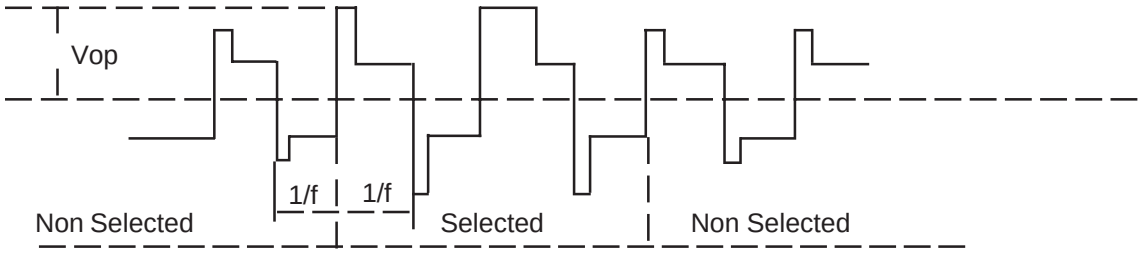
4.2 Electrical Characteristics :

ITEM		SYMBOL	TEST CONDITION	STD. VALUES MIN.	STD. VALUES TYP.	STD. VALUES MAX.	UNITS
Input High Voltage		V_{iH}	-	0.8	-	Vdd	V
Input Low Voltage		V_{iL}	-	Vss		-	0.2
Supply Voltage		V_{dd}-V_{ee}	-	-	-	20.0	V
Current Consumption	Logic	I_{dd}	V_{dd} =5.0V,Flm=74Hz	-	2.6	4.5	mA
	LCD Drive	I_{ee}	V_{dd} -V_o =12.0V	-	1.6	2.8	mA
Operating Voltage for LCD		V_{dd}-V_o	T_a = 0° C	-		8	-
			T_a = 25° C	-	12.0	-	V

5. Electro Optical Characteristics :

ITEM		SYMBOL	MIN	TYP	MAX	UNITS	REMARK	NOTE
Operating Voltage		Vop	8.0	10.0	12.0	V		1
Response Time	Rise time	tr	-	100	150	mSec	Vop=12V	2
	Decay time	td	-	150	200	mSec		
Contrast Ratio		Cr	1.4	4.0	5.0	K	Top=25° C	3
Frame Frequency of LCD		fr	64	72	80	Hz	Top=25° C	1
Viewing Angle 6' Clock (Bottom View)		Θ	20	-	80	deg	F= 0°	4
			20	-	80	deg	F= 90°	
			20	-	80	deg	F= 270°	

Note 1: Definition of Operating Voltage and Frequency (Duty = 1/64 Mux)



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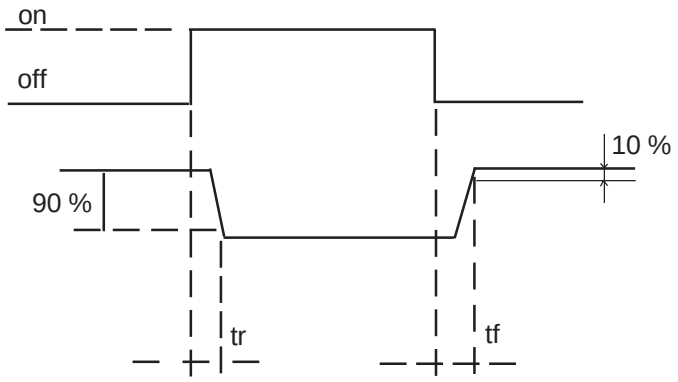
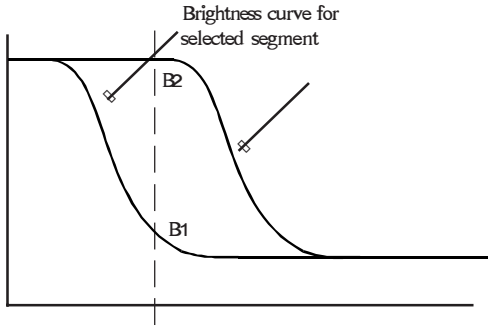
Note 2: Definition of Response Time

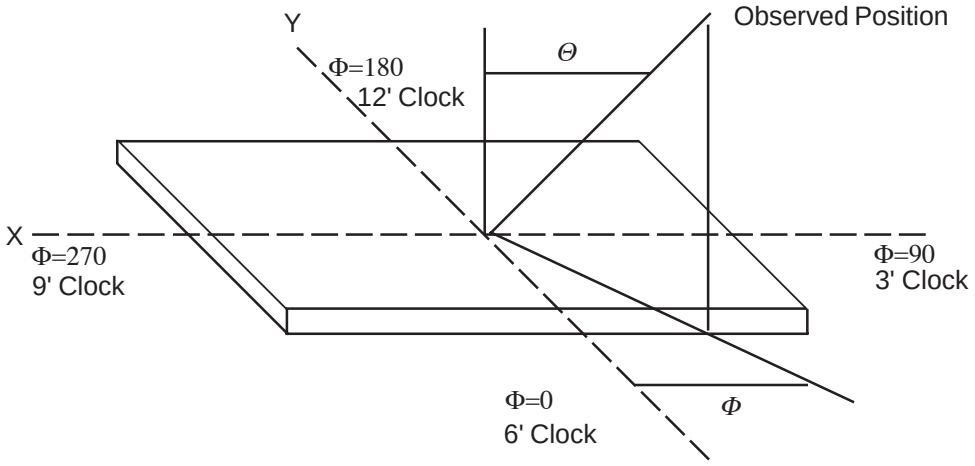


Note 3: Definition of Contrast Ratio

$$K = \frac{\text{Brightness of non-selected segment (B2)}}{\text{Brightness of selected segment (B1)}}$$



Note 3: Definition of Viewing Angle



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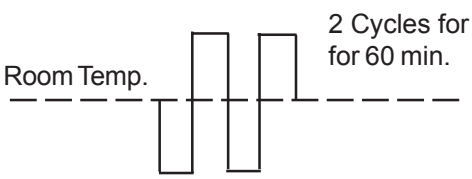
6. Environmental Tests :

ITEM	CONDITION
Storage in High Temperature	+60 ± 2 °C for 240 Hours
Storage in Low Temperature	-20 ± 2 °C for 240 Hours
Damp Heat Storage	+45 ±5 °C for 240 Hours/RH=90 to 95%
Thermal Cycles	 1 Cycle, -20 ± 2 °C for 30 min.
Vibration	Total Amplitude : 2.0 mm Frequency : 10 to 55 Hz/min Tested for above Conditions for X, Y, Z direction for each for 15 min.
Life Expectancy	50,000 Hours Typ.(LCD Panel)

Every Test items shall meet the following Criteria.

(Criteria of Judgement)

1. All of the segments shall not be blurred.
2. All segments shall be usually displayed.

Judgement should be made after exposure in room temperature conditions for 2 Hours.

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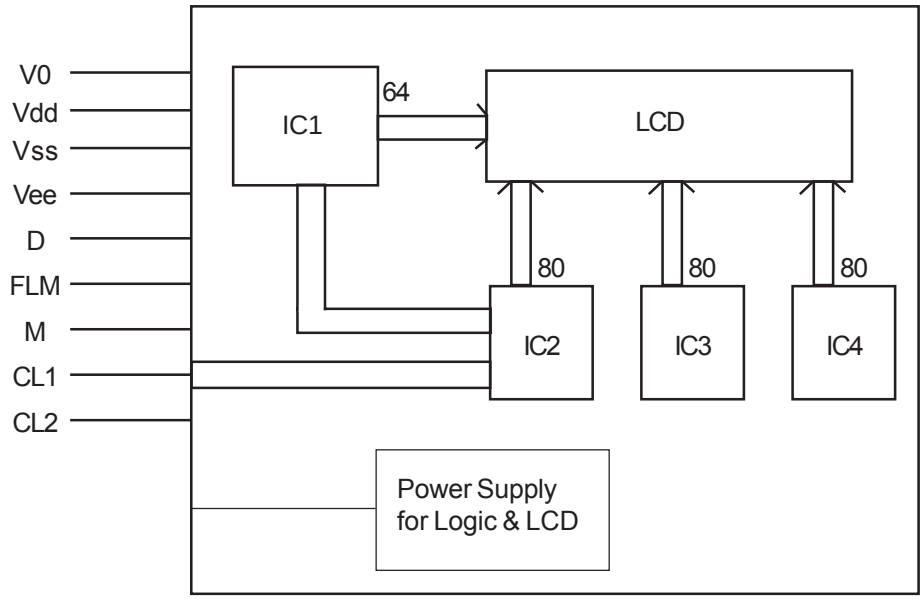
7. Module Connector Pin Layout :

Pin No.	Signal	FUNCTION
1	D	Display Data
2	FLM	The Signal Indicates the begining of each frame
3	M	Alternate Signal for LCD Driving Waveform
4	CL1	Data Latch Signal
5	CL2	Data Shift Clock Pulse
6	NC	No Connection
7	Vdd	Power Supply for Logic (+5 Volts)
8	Vss	Signal Ground
9	Vee	Power Supply for LCD (-12 Volts)
10	Vo	Operating Voltage for LCD Drive (Variable)

8. Schematic Block Diagram :



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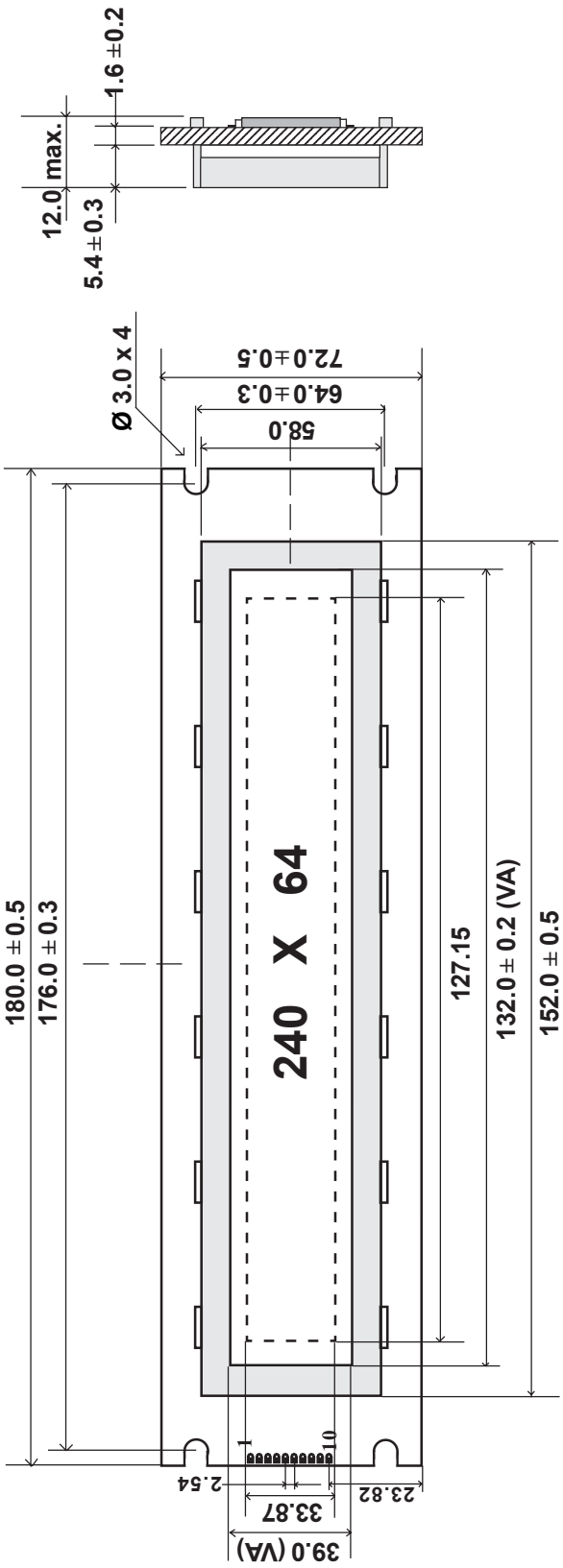
ALL DIMENSIONS IN MM
NOT TO SCALE

MODULE DIMENSIONS



Model Code	:	LG240641SGBC\SYBC
Description	:	240 Pixels x 64 Pixels
Font Matrix	:	5 x 7 plus Cursor = 40 Characters x 8 Lines
Display Type	:	STN, Silver Gray
Poloriser Type	:	Reflective/Positive
		Anti-glare & UV Protected, Hard Coated
Driving Duty	:	1/64 Mux
Viewing Angle	:	6' Clock (Bottom View)
Metal Frame	:	Plated Zinc - Black
Operating Temp.	:	-10 to +60 °C
Storage Temp.	:	-20 to +70 °C
Controllers	:	Graphic LCD Controllers