

LSI

LS3101

Simple LCD micro-controller

Features :

- * 12 Input pad, 3 output pad
- * Direct drive buzzer output.
- * 1024x12 bit ROM
- * 48x4 bit of RAM.
- * 16x3 LCD segment mask option
- * 1/2 bias, 1/3 duty cycle LCD format
- * 32768 Crystal/RC oscillator mask option
- * Single 1.5V operation.
- * Low cost and low price.

General Description

The LSI3101 is a simple micro-controller for LCD application. It has an internal ROM size of 1Kx12bit. A 48x4 bit of RAM. 16x3 LCD segment.

Functional Description

1. RC Oscillator /Crystal

The LS3101 can use either a crystal oscillator or RC oscillator to provide the internal timing by mask option.

2. Program ROM

The LS3101 has internal 1Kx12 bit ROM providing simple operation. It has four internal stack.

3. Program RAM

The system has 48x4bit of program RAM (00H to 2fH).

4. Buzzer Control

The system can output 4khz/2khz alarm signal by mask option at B[0:1].

5. LCD driver

The system has 16 LCD segment pad with 3 common pads providing 16x3 LCD segment output.

6. I/O pad

The LS3101 has 12 input pad, I[0:11], and 3 output pad R[0:2]. The input pads can be selected (by mask option) with/without internal pull-high resistor.

Pin Assignment

DESIGNATION	TYPE	DESCRIPTION
B [0:1]	OUTPUT	Buzzer output
F512, VCAP	OUTPUT	Doubler output
VEE	OUTPUT	-1.5V
T2, T1	INPUT (PL)	TEST pin
COSCO	OUTPUT	32KHz oscillator output
COSCI	INPUT	32KHz oscillator input
VDD	POWER	+1.5V power supply
GND	POWER	Ground
I[0:11]	INPUT(PH)	Input key/option
R[0:2]	OUTPUT	Trigger output (r[0:2])
C[1:3]	OUTPUT	LCD Common output
S[1:16]	OUTPUT	LCD Segment output

Note: (PL) – pull low
(PH) - pull high

Absolute Maximum Ratings

Supply voltage Vdd - Vss.....0 to 5V
 Input voltage Vin.....Vss to Vdd
 Operating temperature Top-10°C to 60°C
 Storing temperature Tst-40°C to 70°C

***Comments**

Stress above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress rating only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied and exposure to absolute maximum rating conditions for extended periods may affect device reliability.

D.C. Electrical Characteristics

(GND = 0V, Vdd = 1.5V, Ta = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	Vdd	1.2	1.5	1.8	V	
Operating current	Idd	-	2	6	μA	No load
OSC. built-in cap	Cd	-	20	-	pF	
OSC. trimmer cap	Ctrim	5	-	35	pF	
Frequency stability	$\Delta f/f$	-	-	10	ppM	Vdd=1.6-1.4
Buzzer output current	Ib	500	-	-	μA	Vbd-Vss=0.5
LCD frequency	Flcd	-	64	-	Hz	
Segment current	Is	0.15	-	-	μA	Vseg=0.2V
Common current	Ic	3.0	-	-	μA	Vcom=0.2V
Trigger output current	Ir	100	-	-	μA	Vr-Vss=0.5

Pad location

PAD	X(μm)	Y(μm)	PAD	X(μm)	Y(μm)
GND	-1500.0	-1500.0	PB	-743.0	+1350.0
VCAP	-1500.0	-1366.0	R2	-593.0	+1350.0
VEE	-1295.0	-1110.0	R1	-449.0	+1350.0
V512	-1295.0	-965.0	R0	-225.0	+1350.0
C3	-1295.0	-825.0	OSCO	-75.0	+1350.0
C2	-1295.0	-685.0	OSCI	+1105.0	+1340.0
C1	-1295.0	-545.0	T1	+1246.0	+1340.0
S1	-1295.0	-400.0	GND	+1246.0	+1140.0
S2	-1295.0	-260.0	B1	+1246.0	+988.0
S3	-1295.0	-120.0	B0	+1246.0	+678.0
S4	-1295.0	+20.0	VDD	+1246.0	+543.0
S5	-1295.0	+160.0	T2	+1246.0	+395.0
S6	-1295.0	+300.0	I7	+1246.0	+226.0
S7	-1295.0	+440.0	I6	+1246.0	+78.0
S8	-1295.0	+580.0	I5	+1246.0	-70.0
S9	-1295.0	+720.0	I4	+1246.0	-216.0
S10	-1295.0	+860.0	I3	+1246.0	-365.0
S11	-1295.0	+1000.0	I2	+1246.0	-513.0
S12	-1295.0	+1140.0	I1	+1246.0	-661.0
S13	-1303.0	+1350.0	I0	+1246.0	-809.0
S14	-1163.0	+1350.0	I8	+1246.0	-957.0
S15	-1023.0	+1350.0	I9	+1246.0	-1105.0
S16	-883.0	+1350.0	I10	+1246.0	-1253.0
			I11	+1246.0	-1400.0

APPLICATION CIRCUIT

