

ELECTRONIC TWO - TONE RINGER

- LOW CURRENT CONSUMPTION, IN ORDER TO ALLOW THE PARALLEL OPERATION OF 4 DEVICES
- INTEGRATED RECTIFIER BRIDGE WITH ZENER DIODES TO PROTECT AGAINST OVER-VOLTAGES
- LITTLE EXTERNAL CIRCUITRY
- TONE AND SWITCHING FREQUENCIES ADJUSTABLE BY EXTERNAL COMPONENTS
- INTEGRATED VOLTAGE AND CURRENT HYSTERESIS

DESCRIPTION

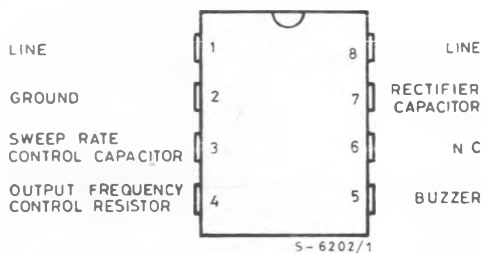
LS1240 and LS1240A are monolithic integrated circuits designed to replace the mechanical bell in telephone sets in connection with an electro-acoustical converter. Both devices can drive directly a piezoceramic converter (buzzer).

The output current capability of LS1240A is higher than LS1240. For driving a dynamic loudspeaker LS1240 needs a transformer, while LS1240A, needs a decoupling capacitor.

No current limitation is provided on the output stage of LS1240A, so a minimum load DC of 50 Ω is advised.

The two tone frequencies generated are switched by an internal oscillator in a fast sequence and made audible across an output amplifier in the loudspeaker, both tone frequencies and the switching frequency can be externally adjusted.

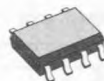
PIN CONNECTION (top view)



MINIDIP



SO-8J



ORDER CODES :

Minidip	SO-8
LS1240	LS1240D1
LS1240A	LS1240AD1

The supply voltage is obtained from the AC ring signal and the circuit is designed so that noise on the line or variations of the ringing signal cannot affect correct operation of the device.

BLOCK DIAGRAM

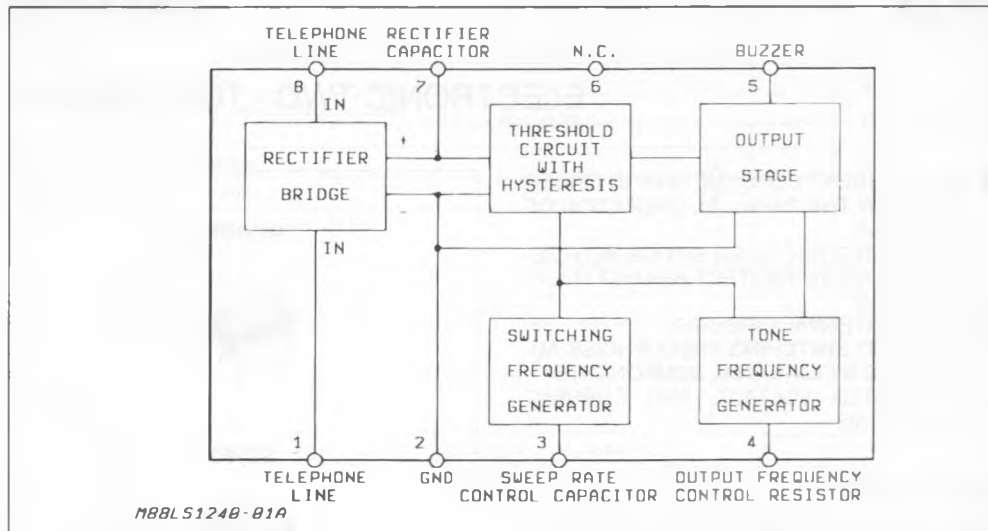
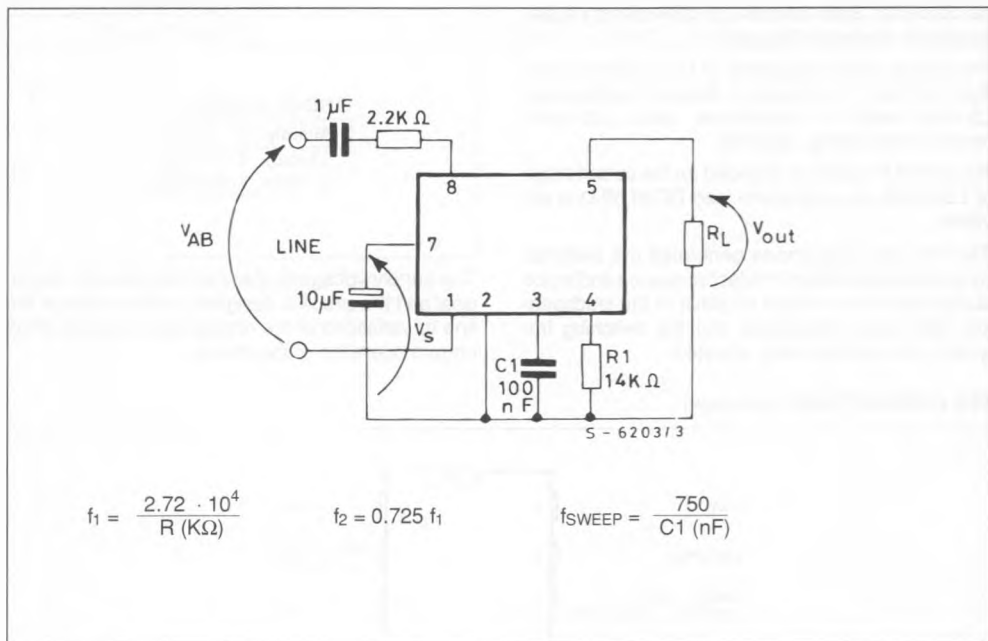


Figure 1 : Test Circuit.



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{AB}	Calling Voltage ($f = 50$ Hz) Continuous	120	V_{rms}
V_{AB}	Calling Voltage ($f = 50$ Hz) 5s ON/10s OFF	200	V_{rms}
DC	Supply Current	30	mA
T_{op}	Operating Temperature	- 20 to + 70	°C
T_{stg}	Storage and Junction Temperature	- 65 to + 150	°C

THERMAL DATA

$R_{th j-amb}$	Thermal Resistance Junction-ambient	Max	100	°C/W
----------------	-------------------------------------	-----	-----	------

ELECTRICAL CHARACTERISTICS

($T_{amb} = 25$ °C; V_s = applied between pins 7-2 unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_s	Supply Voltage				26	V
I_B	Current Consumption without Load (pins 8-1)	$V_s = 9.3$ to 25 V		1.5	1.8	mA
V_{ON}	Activation Voltage LS1240 LS1240A		12.2 12		13.2 13.5	V V
V_{OFF}	Sustaining Voltage LS1240 LS1240A		8 7.8		9 9.3	V V
R_D	Differential Resistance in OFF Condition (pins 8-1)		6.4			K Ω
V_{OUT}	Output Voltage Swing			$V_s - 5$		V
I_{OUT}	Short Circuit Current (pins 5-2) LS1240 LS1240A	$V_s = 20$ V $R_L = 0$ Ω $R_L = 250$ Ω		35 70		mA mA

AC OPERATION

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
f_1	Output Frequencies	$V_s = 26$ V $R_1 = 14$ K Ω				
f_{out1}		$V_s = 0$ V	1.74		2.14	KHz
f_2		$V_s = 6$ V	1.22		1.6	
	f_{out1} f_{out2}		1.33		1.43	
	Programming Resistor Range		8		56	K Ω
f_{SWEEP}	Sweep Frequency	$R_1 = 14$ K Ω $C_1 = 100$ nF	5.25	7.5	9.75	Hz

Figure 2 : Typical Application for LS1240.

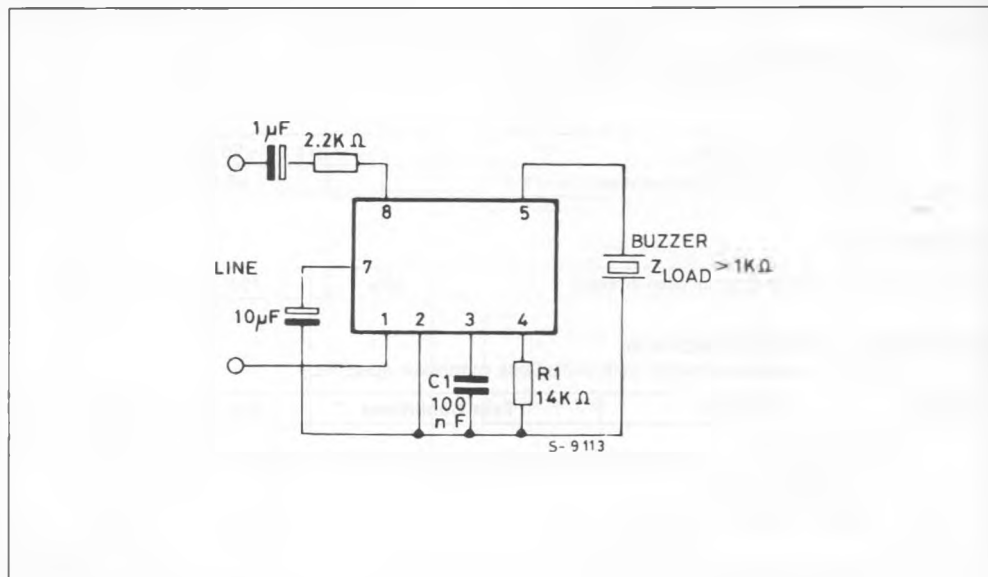


Figure 3 : Typical Application for LS1240A.

