

**ELECTRONIC TWO - TONE RINGER**

- LOW CURRENT CONSUMPTION, IN ORDER TO ALLOW THE PARALLEL OPERATION OF A DEVICE
- 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

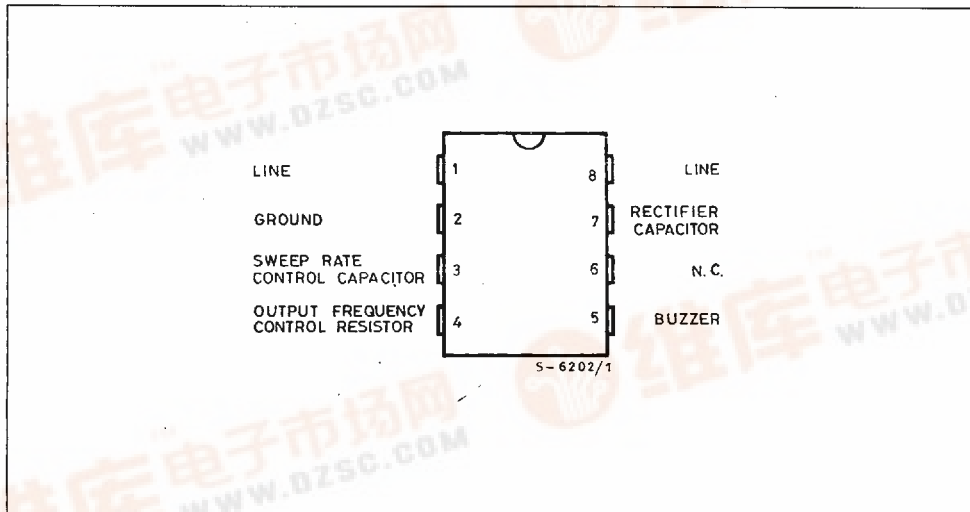
**DESCRIPTION**

LS1241 is a monolithic integrated circuit designed to replace the mechanical bell in telephone sets, in connection with an electro acoustical converter. The device can drive either directly a piezo ceramic converter (buzzer) or a small loudspeaker. In this case a transformer is needed. The two tone frequencies generated are switched by an output amplifier in the loudspeaker ; both tone frequencies and the switching frequency can be externally adjusted.



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

**PIN CONNECTION (top view)**



BLOCK DIAGRAM

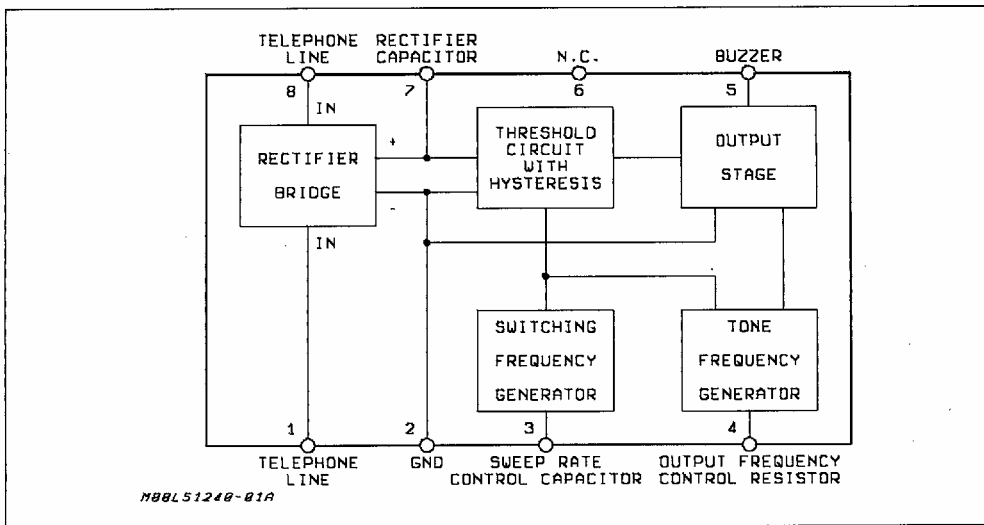
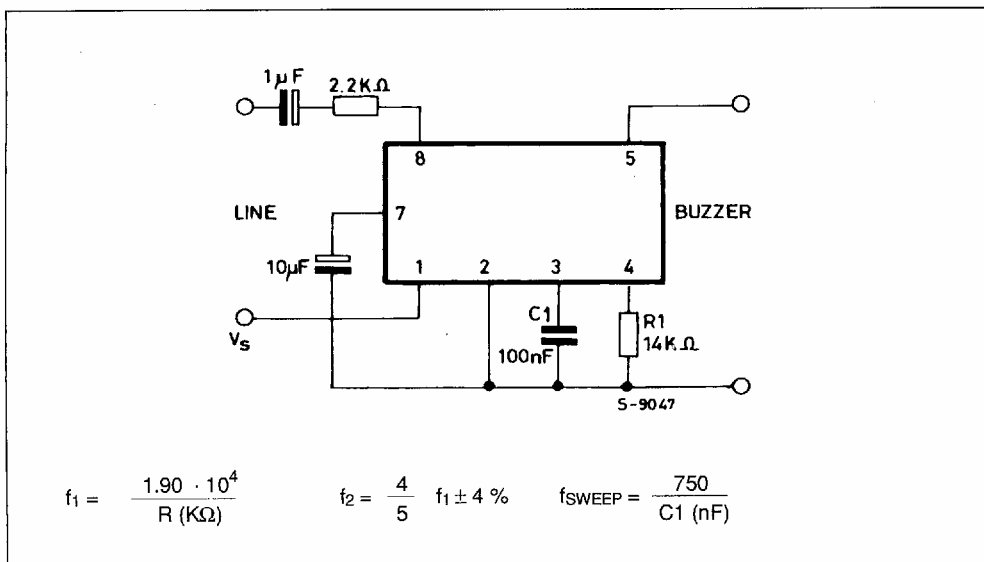


Figure 1 : Test Circuit.



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
V <sub>AB</sub> *	Calling Voltage (f = 50Hz) Continuous	120	V <sub>RMS</sub>
V <sub>AB</sub> *	Calling Voltage (f = 50Hz) 1.8s ON/3.6s OFF	200	V <sub>RMS</sub>
DC	Supply Current	30	mA
T <sub>oper</sub>	Operating Temperature	- 20 to + 70	°C
T <sub>stg</sub>	Storage and Junction Temperature	- 65 to + 150	°C

\* See test circuit of figure 1.

**THERMAL DATA**

Symbol	Parameter	Value	Unit
R <sub>th j-amb</sub>	Thermal Resistance Junction-ambient Max	100	°C/W

**ELECTRICAL CHARACTERISTICS**(T<sub>amb</sub> = 25°C; V<sub>S</sub> = applied between pins 7-2 unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V <sub>S</sub>	Supply Voltage				26	V
I <sub>B</sub>	Current Consumption without Load (pins 8-1)	V <sub>8-1</sub> = 9 to 25V		1.5	1.8	mA
V <sub>ON</sub>	Activation Voltage		12.2		13.2	V
V <sub>OFF</sub>	Sustaining Voltage		8		9	V
R <sub>D</sub>	Differential Resistance in OFF Condition (pins 8-1)		6.4			kΩ
V <sub>OUT</sub>	Output Voltage Swing			V <sub>S</sub> - 5		V
I <sub>OUT</sub>	Short Circuit Current (pins 5-2)	V <sub>S</sub> = 20V		35		mA

**AC OPERATION**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
f <sub>1</sub> f <sub>2</sub>	Output Frequencies f <sub>out1</sub> f <sub>out2</sub>	V <sub>S</sub> = 26V, R <sub>1</sub> = 14kΩ V <sub>3</sub> = 0V V <sub>3</sub> = 6V	1.21 0.93		1.5 1.25	kHz
	f <sub>OUT1</sub> f <sub>OUT2</sub>		1.2		1.3	
	Programming Resistor Range		5		50	kΩ
F <sub>SWEEP</sub>	Sweep Frequency	R <sub>1</sub> = 14kΩ, C <sub>1</sub> = 100nF	5.25	7.5	9.75	Hz