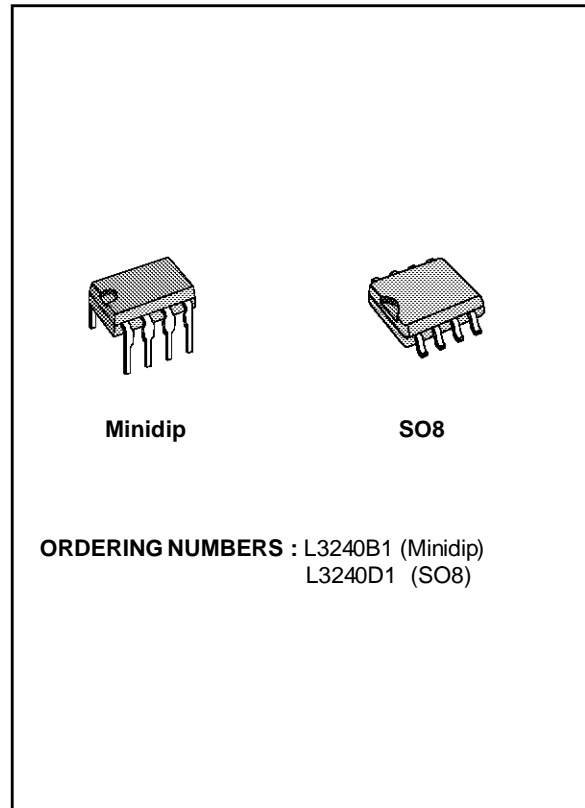


ELETRONIC TWO-TONE RINGER

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



DESCRIPTION

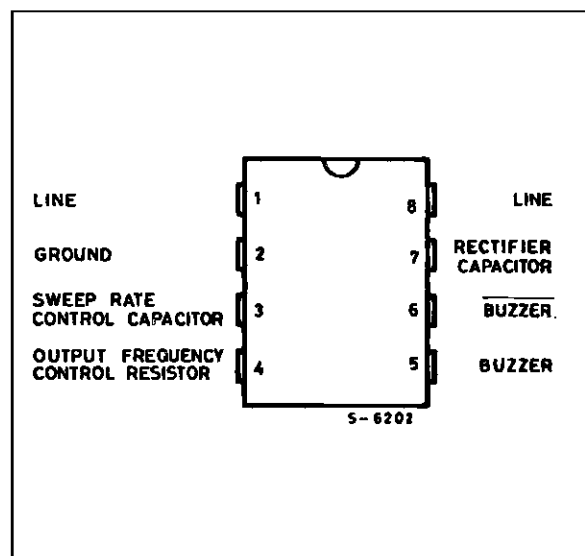
L3240 is a monolithic integrated circuit designed to replace the mechanical bell in telephone sets, in connection with an electro acoustical converter. The device can drive either directly a piezo ceramic converter (buzzer) or a small loudspeaker. In this case a transformer is needed. The two tone frequencies generated are switched by an internal oscillator in a fast sequence and made audible across output amplifiers in the transducer; 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 so that noise on the line or variations of the ringing signal cannot affect the correct operation of the devices.

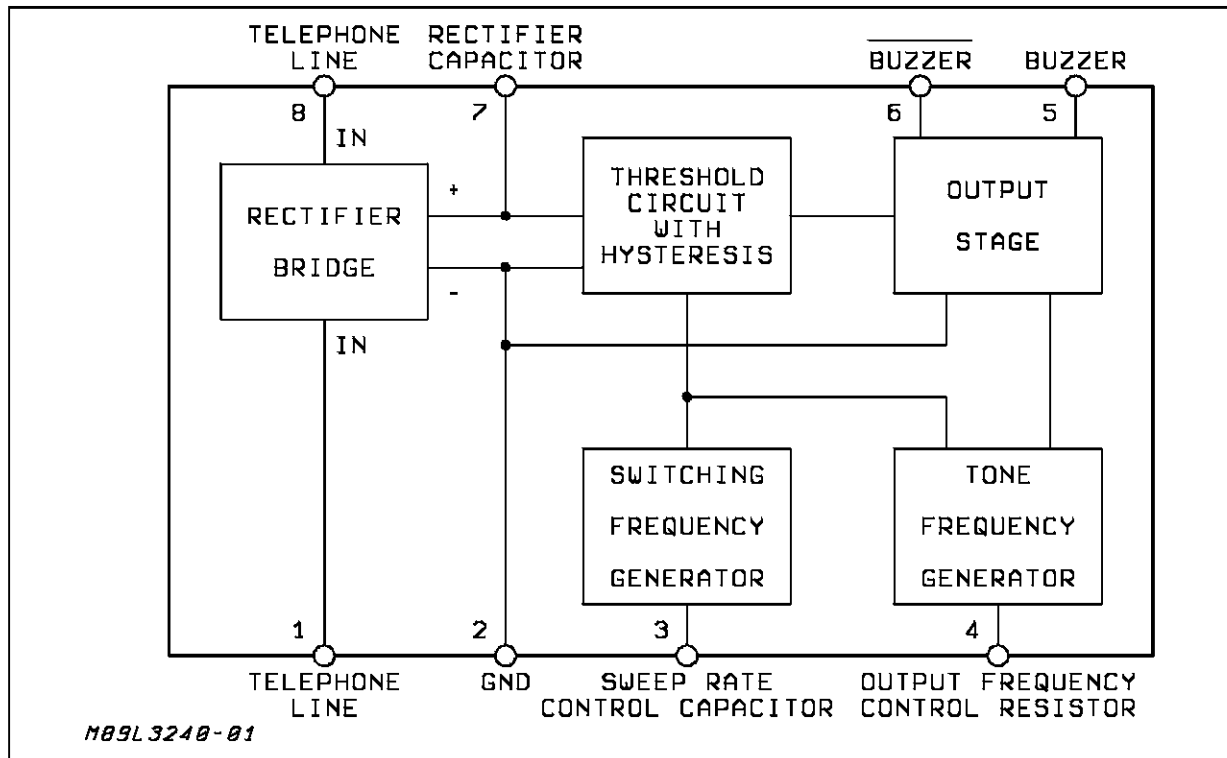
The output bridge configuration allows to use a high impedance transducer with acoustical results much better than in a single ended configuration.

The two outputs can also be connected independently to different converters or actuators (acoustical, opto, logic).

PIN CONNECTION (top view)



BLOCK DIAGRAM



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 N/10s OFF	200	V_{RMS}
DC	Supply Current	30	mA
T_{op}	Operating Temperature	- 20, + 70	$^{\circ}C$
T_{stg}	Storage and Junction Temperature	- 65, + 150	$^{\circ}C$

THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max. 100	$^{\circ}C/W$

ELECTRICAL CHARACTERISTICS

($T_{amb} = 25^{\circ}C$; $V_S =$ applied between pins 7-2 ; 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)	$V_{8-1} = 16.5$ to 29.5 V		1.5	1.8	mA
V_{ON}	Activation Voltage		12		13.5	V
V_{OFF}	Sustaining Voltage		7.8		9.3	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 5-6)	$V_S = 20$ V		35		mA
V_S	Voltage Drop between Pins 8-1 and Pins 7-2			3		V

ELECTRICAL CHARACTERISTICS

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

AC OPERATION

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
	Output Frequencies	V _s = 26 V, R ₁ = 14 KΩ				kHz
	F _{out 1}	V _s = 0 V	2,29		2,8	
	F _{out 2}	V _s = 6 V	1.6		2.1	
	F _{out 1}		1.33		1.43	
	F _{out 2}					
	Programming Resistor Range		8		56	kΩ
	Sweep Frequency	R ₁ = 14kΩ, C ₁ =100nF	5.25	7,5	9.75	Hz

Figure 1 : Test Circuit.

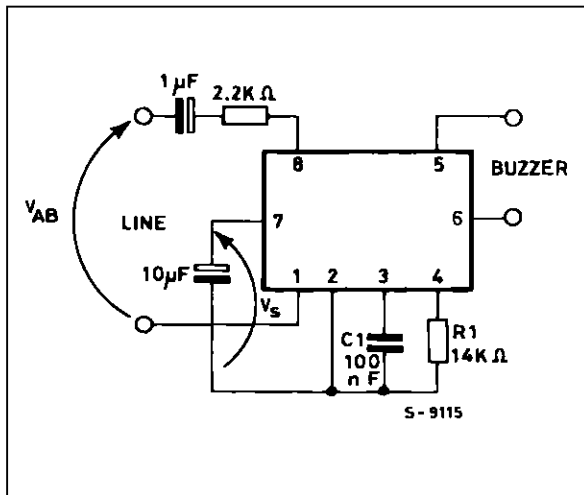


Figure 2 : Typical Application with Balanced Output.

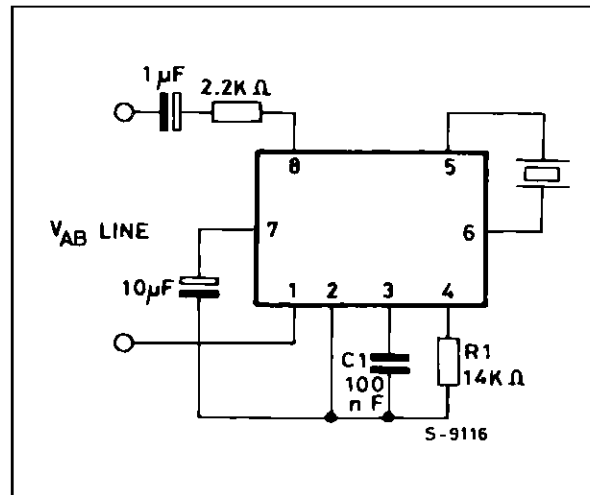


Figure 3 : Application Compatible with LS1240 (single ended output).

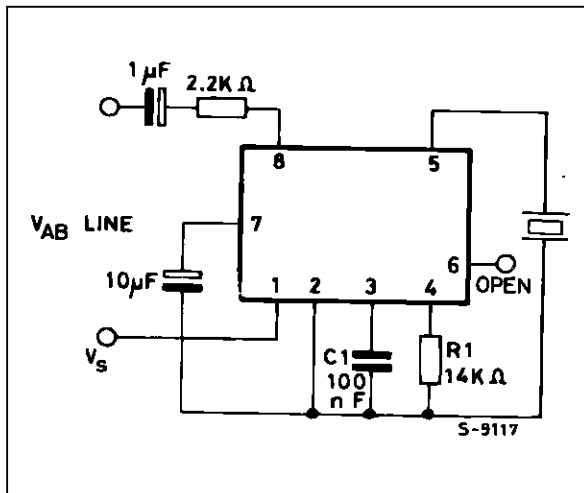
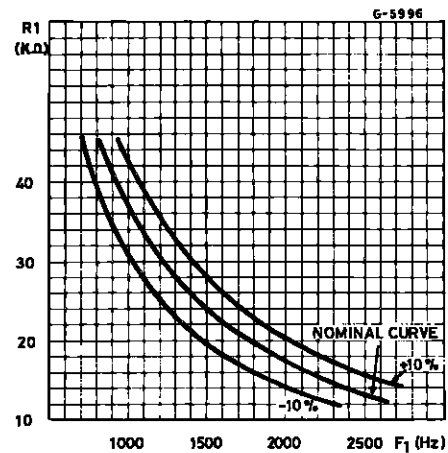


Figure 4 : F₁ Out vs. R₁.



$$R_1 \approx \frac{3.56 \times 10^4}{F_1 \text{ (HZ)}} \times \left(1 - 0.12 \times \ln \frac{F_1}{2543}\right)$$

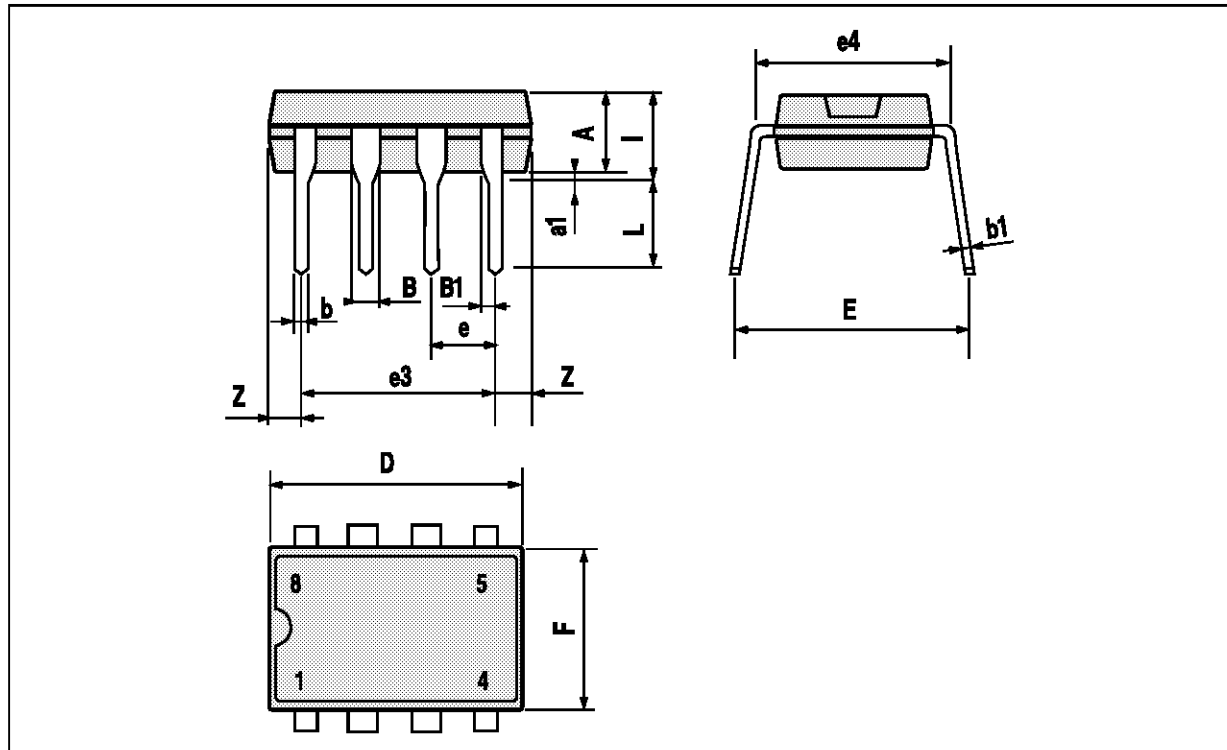
$$f_2 = 0.725 f_1$$

$$f_{\text{SWEEP}} = \frac{750}{C_1 \text{ (nF)}}$$

MINIDIP PACKAGE MECHANICAL DATA

DIM	mm			inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
i			5.08			0.200
L	3.18		3.81	0.125		0.150
Z			1.52			0.060

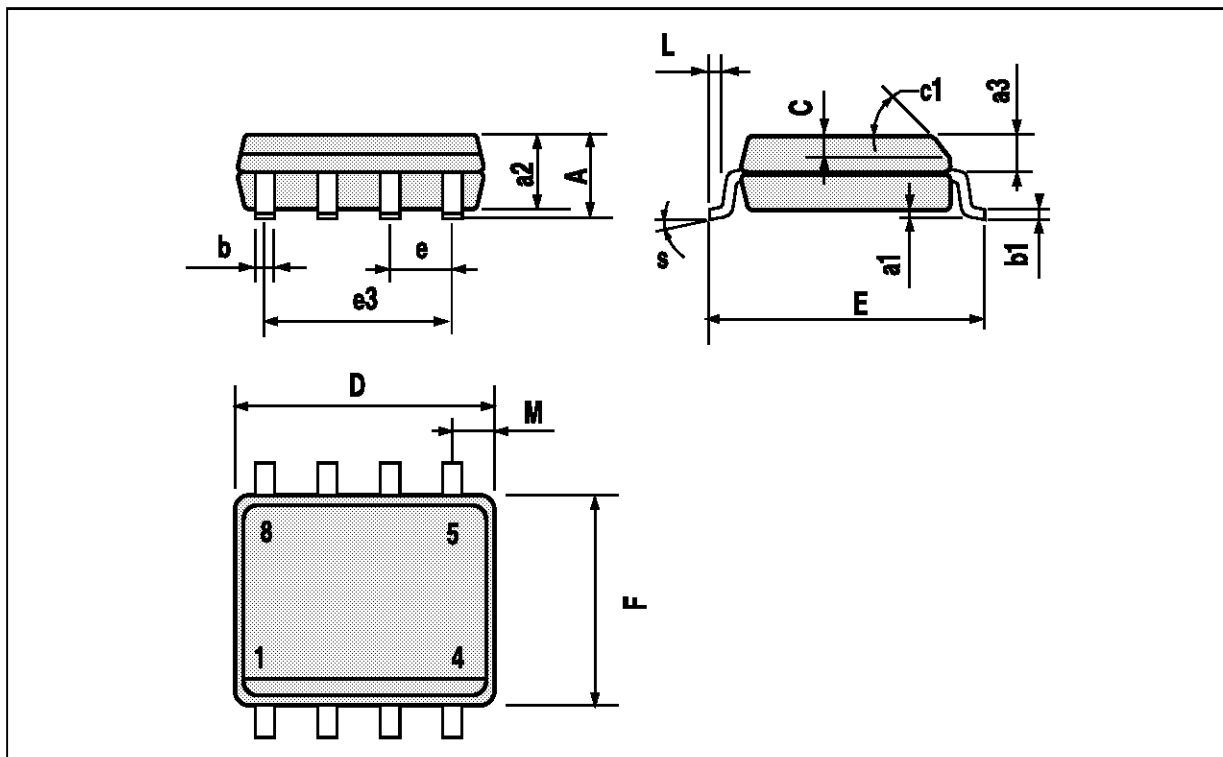
DIP8,TBL



SO8 PACKAGE MECHANICAL DATA

DIM	mm			inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45° (typ.)					
D	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.150		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max.)					

SO8:TBL



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands
Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.