

**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 OVERVOLTAGES
- LITTLE EXTERNAL CIRCUITRY
- TONE AND SWITCHING FREQUENCIES ADJUSTABLE BY EXTERNAL COMPONENTS
- INTEGRATED VOLTAGE AND CURRENT HYSTERESIS

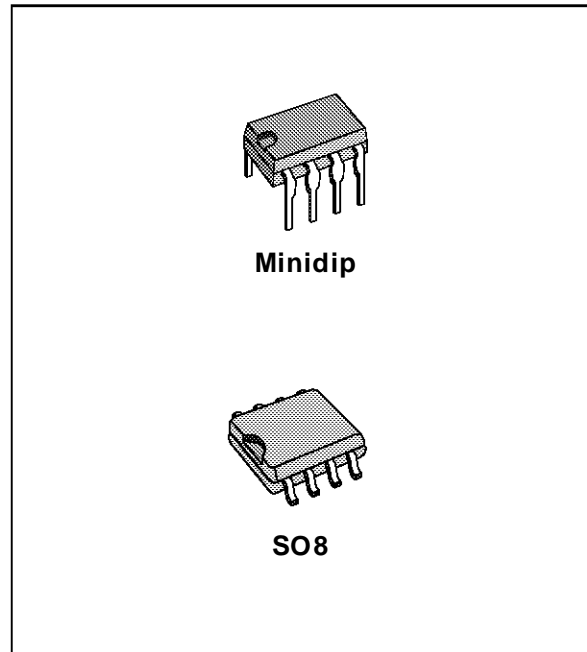
**DESCRIPTION**

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 piezo-ceramic 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.

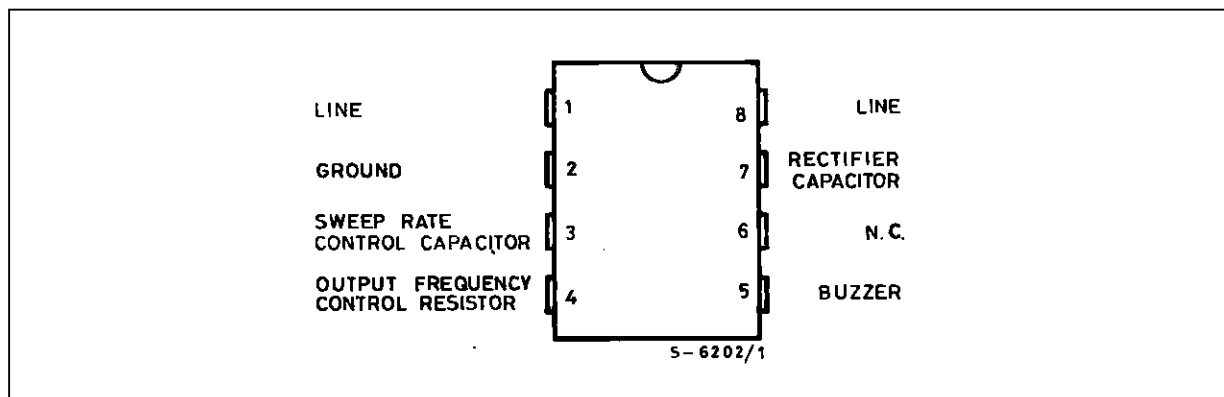


**ORDERING NUMBERS**

Minidip	SO8
LS1240	-
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.

**PIN CONNECTION (top view)**



BLOCK DIAGRAM

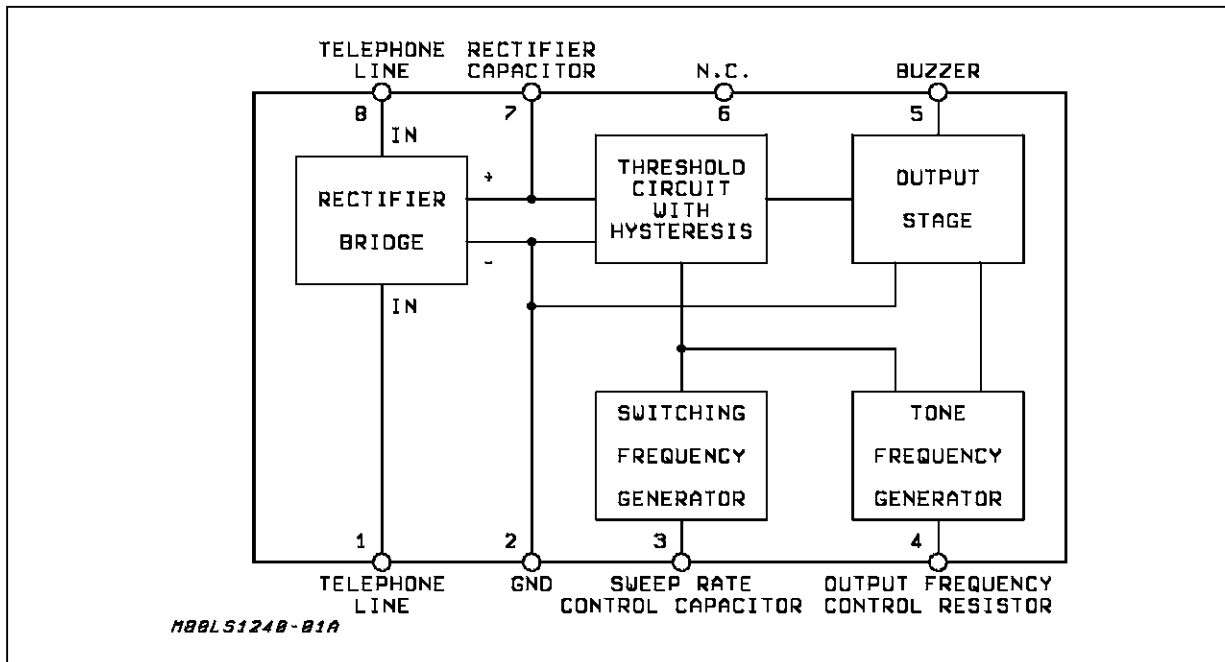
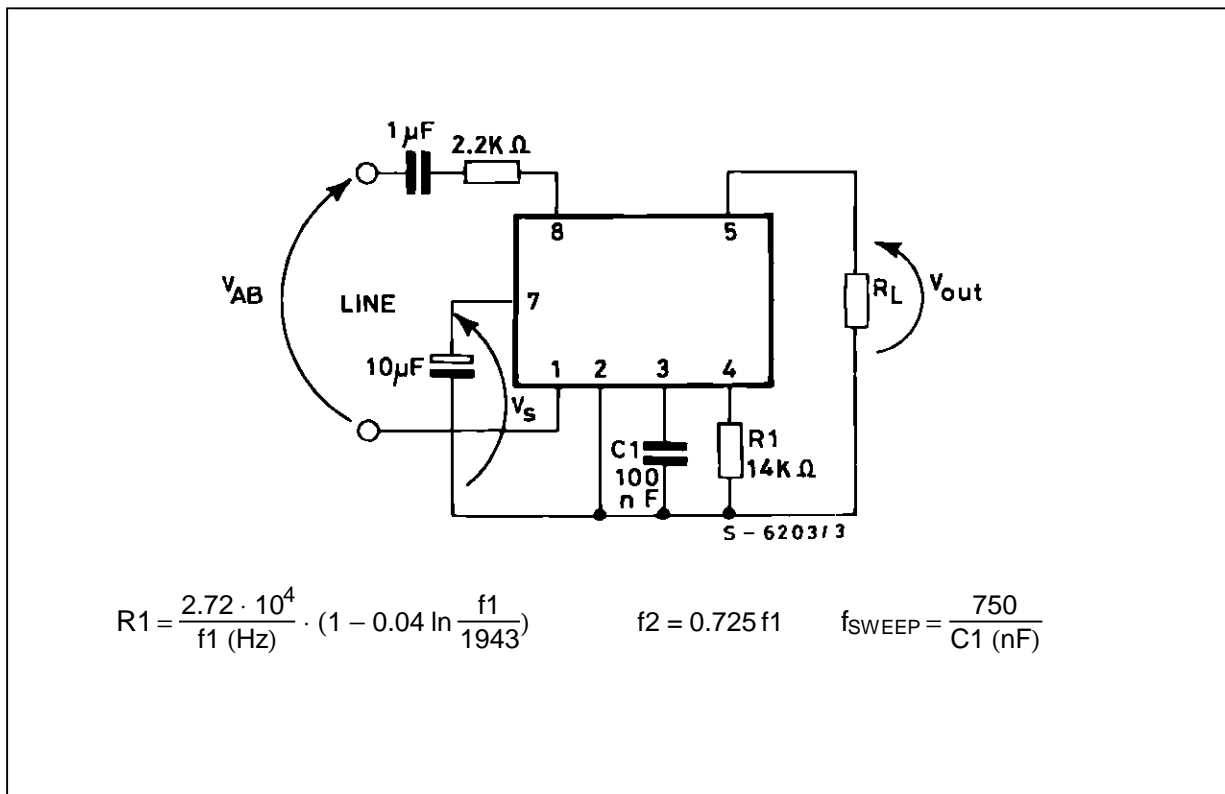


Figure 1 : Test Circuit.



**ABSOLUTE MAXIMUM RATINGS**

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

**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> = 9.3 to 25 V		1.5	1.8	mA
V <sub>ON</sub>	Activation Voltage	LS1240 LS1240A	12.2 12		13.2 13.5	V V
V <sub>OFF</sub>	Sustaining Voltage	LS1240 LS1240A	8 7.8		9 9.3	V 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)	LS1240 LS1240A	V <sub>s</sub> = 20V R <sub>L</sub> = 0Ω R <sub>L</sub> = 250Ω		35 70	mA mA

**AC OPERATION**

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>s</sub> = 0 V V <sub>s</sub> = 6V	1.74 1.22		2.14 1.6	kHz
	f <sub>OUT1</sub> f <sub>OUT2</sub>		1.33		1.43	
	Programming Resistor Range		8		56	kΩ
f <sub>SWEEP</sub>	Sweep Frequency	R <sub>1</sub> = 14kΩ, C <sub>1</sub> = 100nF	5.25	7.5	9.75	Hz

LS1240/LS1240A

Figure 2 : Typical Application for LS1240 and LS1240A

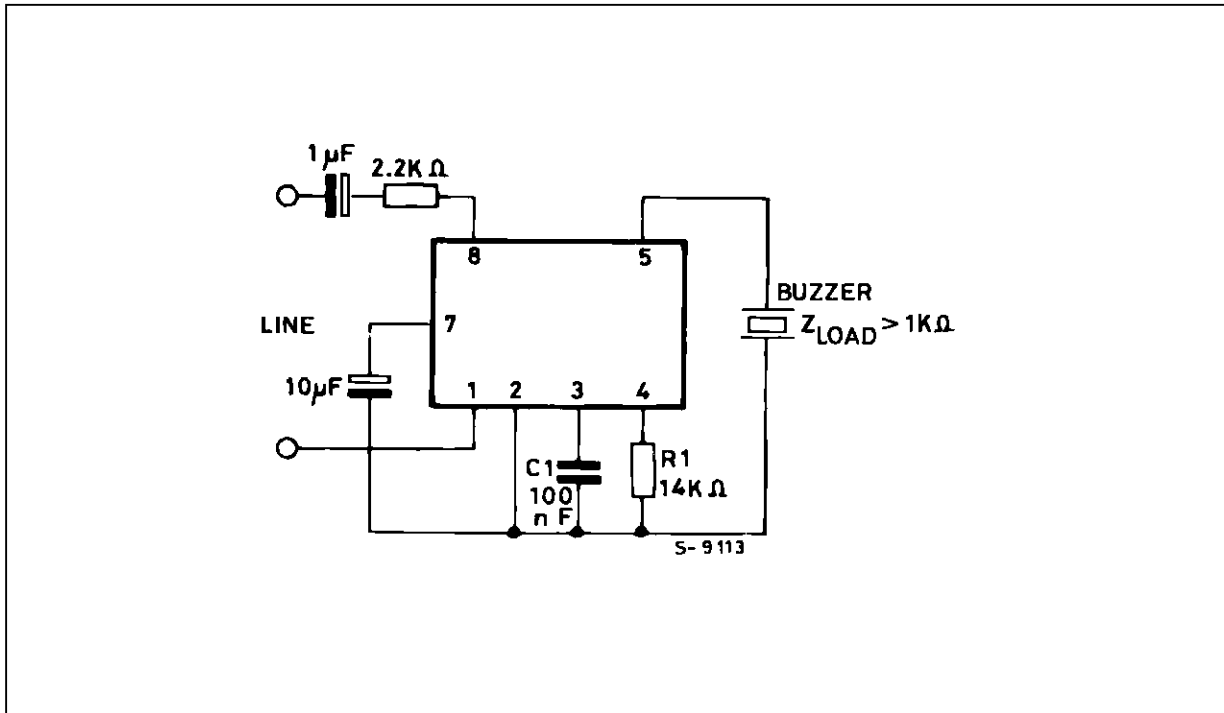
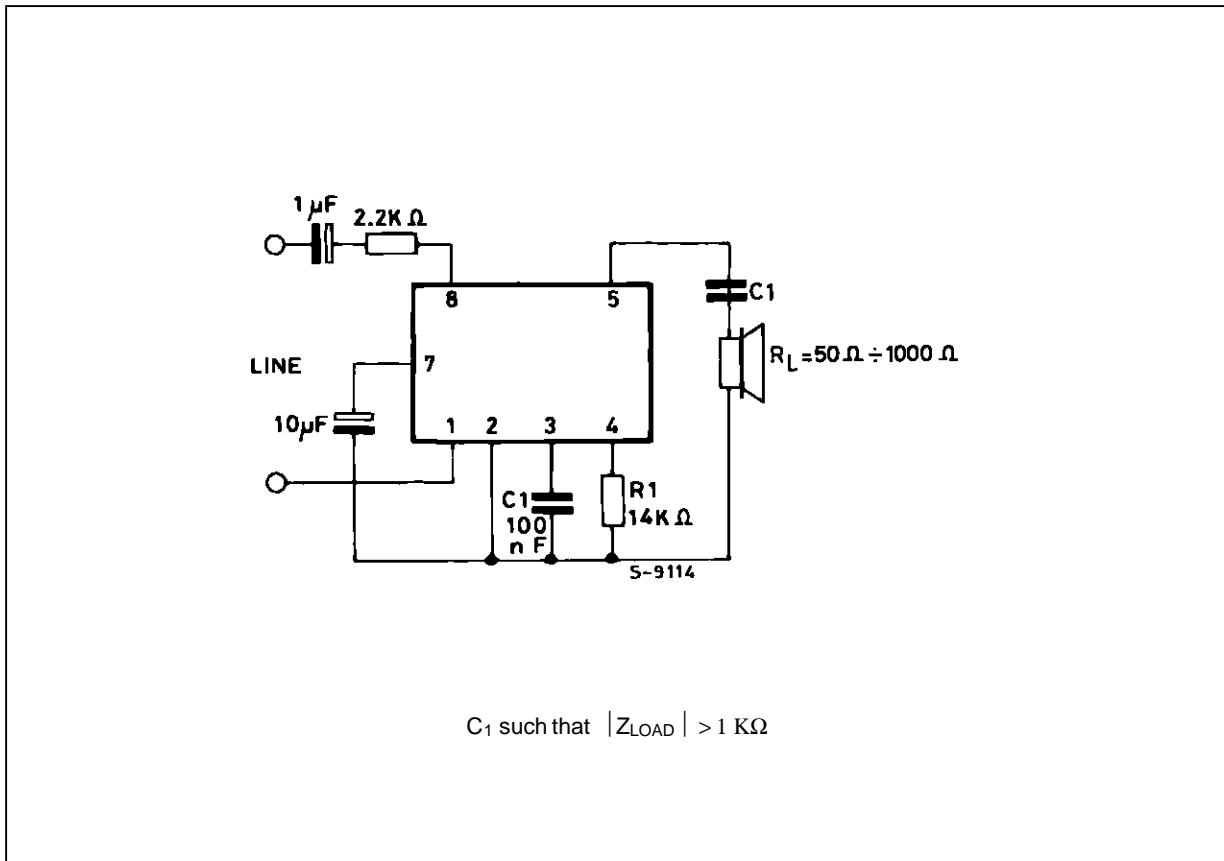


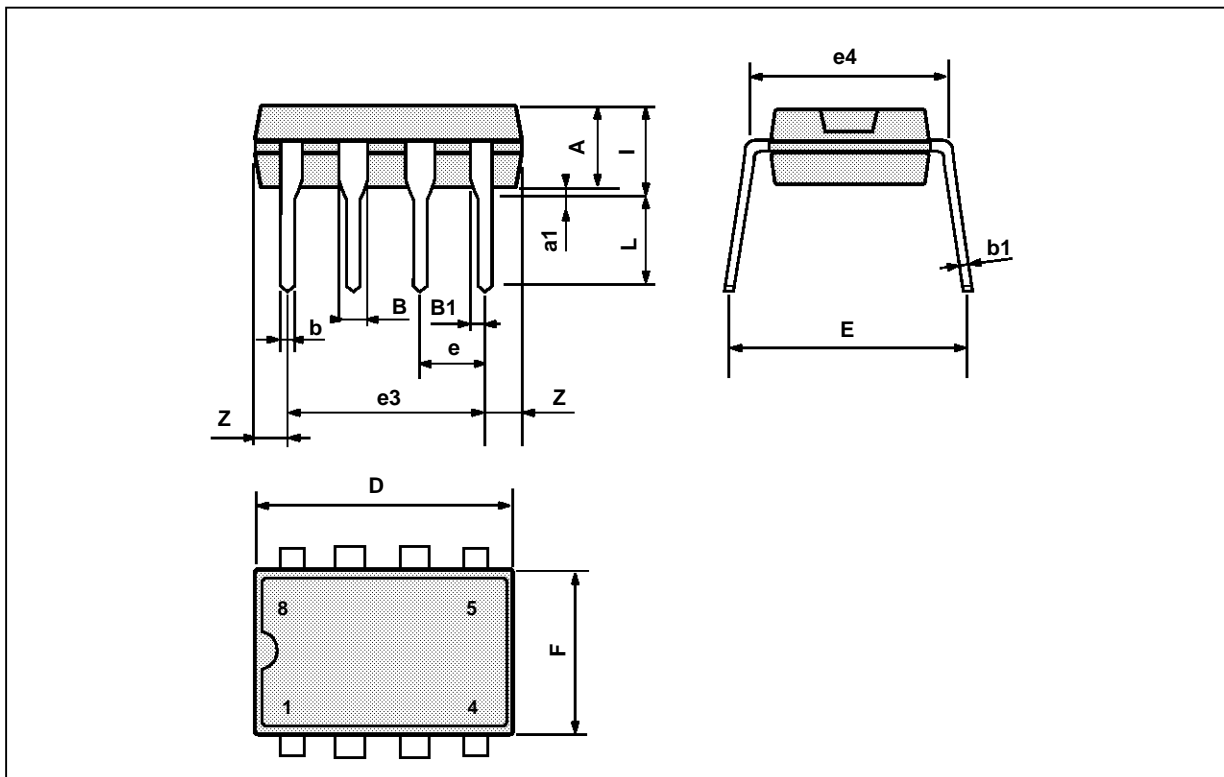
Figure 3 : Typical Application for LS1240A only.



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

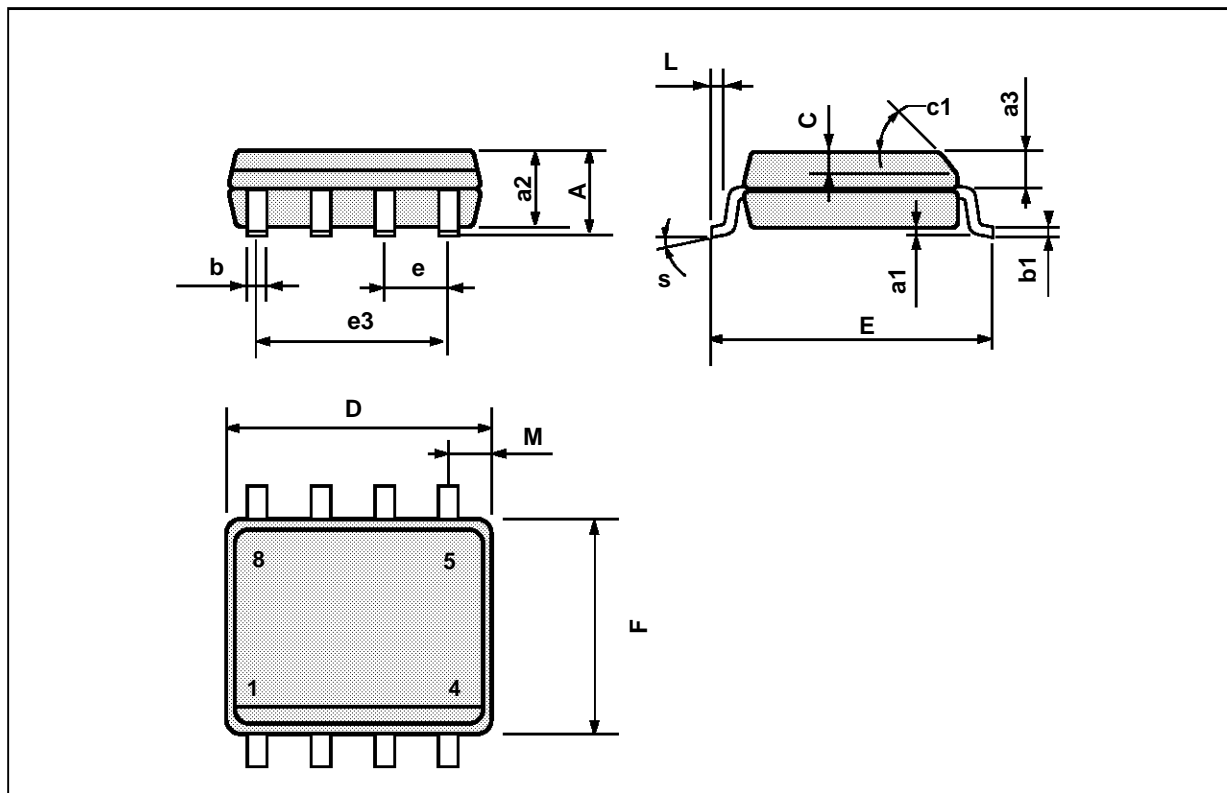


PM-DIP8.EPS

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



PM-SO8.EPS

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.