PLESSEY
Semiconductors

PRELIMINARY INFORMATION

SL8204

TELEPHONE TONE RINGER

The SL8204 is a telephone set tone ringer IC. It is packaged in an 8 pin DIL Minidip. The unit is designed for use as a telephone set bell replacement, or as an extension ringer. The SL8204 will drive a speaker in place of the existing bell, using power supplied from the telephone line.

Two audio oscillators are incorporated. The low frequency oscillator shifts the high frequency oscillator between 508 and 635Hz at a 10Hz rate. These frequencies are determined by external components which may be changed as desired. The IC has a built-in threshold circuit with hysteresis which prevents false triggering, eliminates rotary dial 'chirps', and provides positive switching operation.

The IC may also be used for other applications requiring an attention-getting sound. Output power from the built-in amplifier is nominally 35mW, and will produce a maximum 90dBA sound pressure-level from a properly baffled 2 inch speaker.

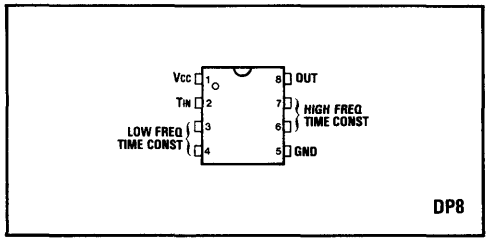

Fig.1 Pin connections - top view

FEATURES

- Low Current Drain
- Small Size (mini-DIP)
- Adjustable Frequency
- Threshold Circuit Prevents False Triggering and Rotary Dial 'Chirps'
- Built-In Hysteresis For Positive Enable
- Few External Components
- Up To 90dBA Sound Pressure Level

ABSOLUTE MAXIMUM RATINGS

Supply voltage	30V d.c.
Storage temperature range	-65°C to +150°C
Operating temperature range	-45°C to +65°C

APPLICATIONS

- Telephone Bell Replacement
- Extension Ringers

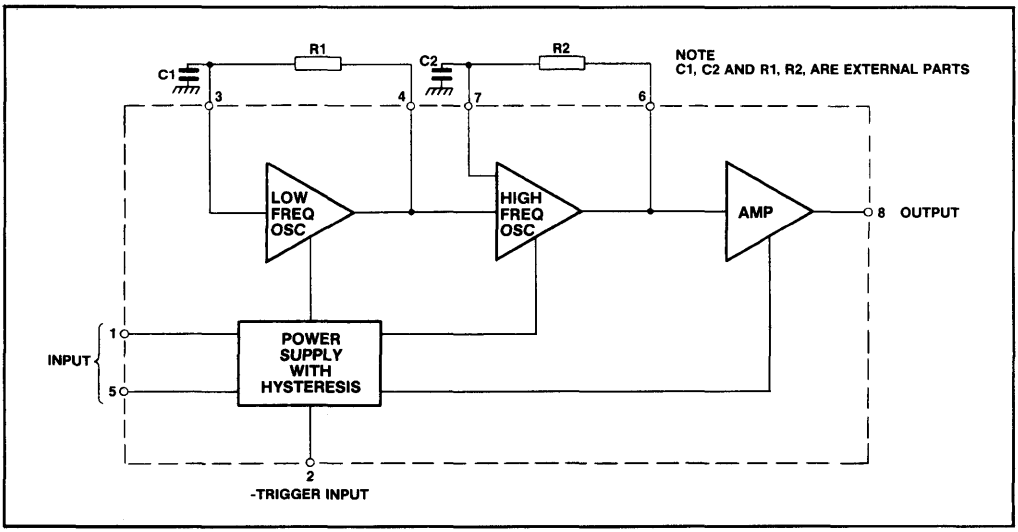

Fig.2 SL8204 block diagram

ELECTRICAL CHARACTERISTICS

Test conditions (unless otherwise stated):
T_{amb} = -45°C to +65°C

Characteristic	Value			Units	Conditions		
	Min.	Typ.	Max.				
Initiation supply voltage V_{SI}	17	19	21	V	See Fig.4		
Sustaining voltage V_{SUS}	9.7	11.5	13	V	See Fig.4		
Supply current I_{SI}	1.4	2.5	4.2	mA	No load. See Fig.4		
Supply current I_{SUS}	0.7	1.4	2.5	mA	See Fig.4		
K1, f_{H1} (constant) See Eq.1	1/1.681	1/1.515	1/1.380				
f_{H1} (frequency)	458	508	558	Hz	R_2 = 191k	C_2 = 6800pF	
K2, f_{H2} (constant) See Eq. 2	1.190	1.250	1.310				
f_{H2} (frequency)	545	635	731	Hz	R_2 = 191k	C_2 = 6800pF	
K3, f_L (constant) See Eq. 3	1/1.367	1/1.234	1/1.118				
f_L (frequency)	9	10	11	Hz	R_1 = 173k	C_1 = 0.47μF	
Operating voltage	-	-	29	V			
Output voltage high	18.0	19.0	20.0	V	V_{CC} = 21V Pin 6 = 6V	I(Pin 8) = -15mA Pin 7 = GND	
Output voltage low	0.5	0.9	1.3	V	V_{CC} = 21V Pin 6 = GND	I(Pin 8) = 15mA Pin 7 = 6V	
Trigger voltage V_T	8.5	9.5	10.5	V	V_{CC} = 15V See Note 1		
Trigger current I_T		20.0	1000	μA	See Notes 1 and 3		
Disable voltage V_D		0.4	0.8	V	T_{amb} = 25°C See Note 2		
Disable current	-40	-50		μA	T_{amb} = 25°C See Note 2		
I_{IN} (Pin 3)	-	-	500	nA	Pin 3 = 6V	Pin 4 = GND	
I_{IN} (Pin 7)	-	-	500	nA	Pin 7 = 6V	Pin 6 = GND	
I (Pin 4) Source V_{CC} = V_{SUS}	150	300	600	μA	Pin 3 = GND	Pin 4 = GND	
I (Pin 4) Sink V_{CC} = V_{SUS}	100	200	350	μA	Pin 3 = 6V	Pin 4 = 5V	
I (Pin 6) Source V_{CC} = V_{SUS}	80	175	350	μA	Pin 6 = GND	Pin 7 = GND	Pin 4 = GND
I (Pin 6) Source V_{CC} = V_{SUS}	125	250	500	μA	Pin 6 = GND	Pin 7 = GND	Pin 4 = 8V
I (Pin 6) Sink V_{CC} = V_{SUS}	70	125	250	μA	Pin 6 = 5V	Pin 7 = 6V	Pin 4 = GND
I (Pin 6) Sink V_{CC} = V_{SUS}	100	200	300	μA	Pin 6 = 5V	Pin 7 =6V	Pin 4 = 8V

NOTES
1. V_T and I_T are the conditions applied to Pin 2 to start oscillation for $V_{SUS} < V_{CC} < V_{SI}$
2. V_D and I_D are the conditions applied to Pin 2 to inhibit oscillation for $V_{SI} < V_{CC}$
3. Trigger Current must be limited externally

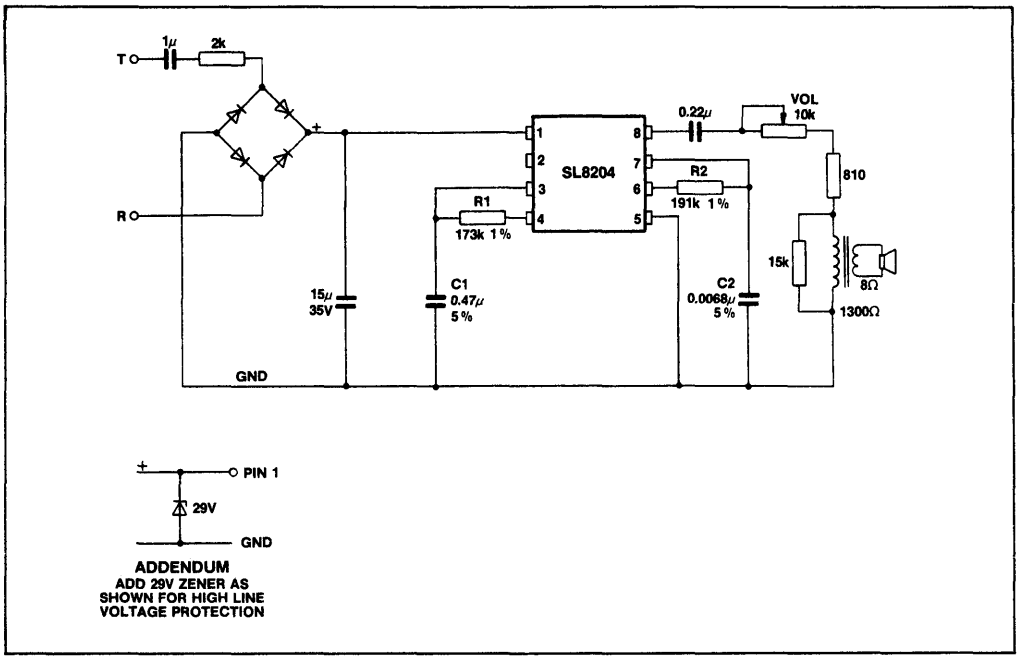

Fig.3 Circuit diagram - tone ringer

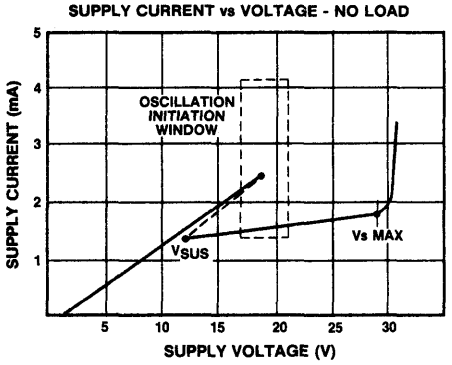

Fig.4 Tone ringer characteristics

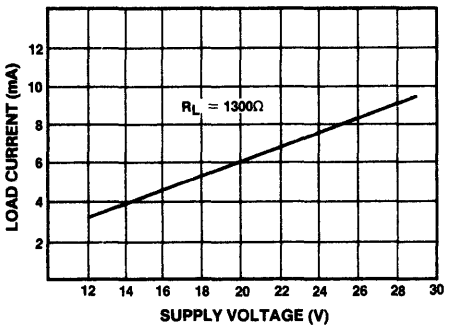

Fig.5 Typical RMS current

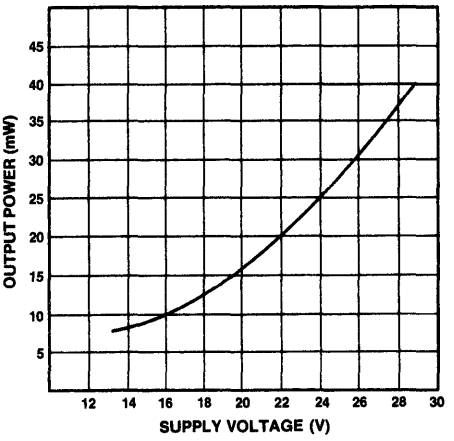

Fig.6 Typical power output