

# UTC2410

# LINEAR INTEGRATED CIRCUIT

## TONE RINGER

### GENERAL DESCRIPTION

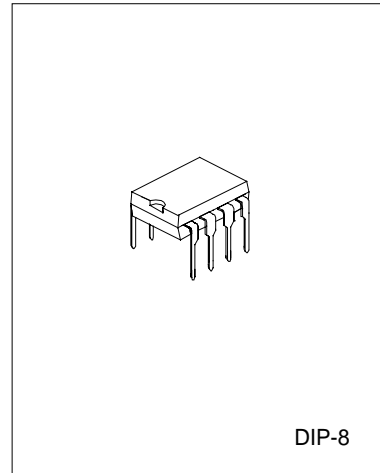
The UTC2410 is a bipolar integrated circuit designed for telephone bell replacement.

### FUNCTIONS

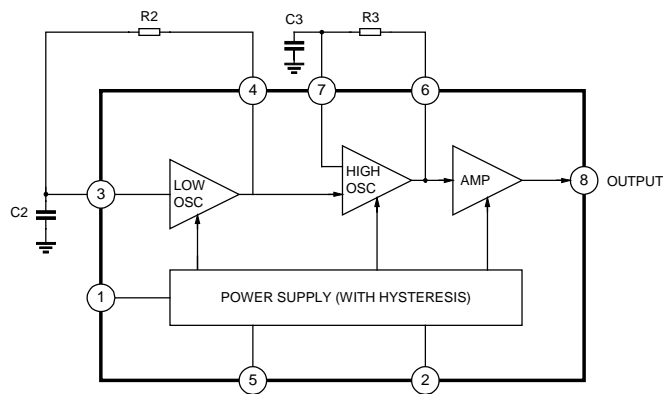
- \*Two oscillators
- \*Output amplifier
- \*Power supply control circuit

### FEATURES

- \*Designed for telephone bell replacement.
- \*Low current drain.
- \*Small size 'MINIDIP' package.
- \*Adjustable 2-frequency tone.
- \*Adjustable warbling rate.
- \*Built-in hysteresis prevents false triggering and rotary dial 'CHIRPS'.
- \*Extension tone ringer modules.
- \*Alarms or other alerting devices.
- \*Adjustable for reduced supply initiation current.



### BLOCK DIAGRAM



Note: R2, R3, C2 and C3 are parts externally mounted



**ABSOLUTE MAXIMUM RATINGS**(Ta=25°C )

Characteristic	Symbol	Value	Unit
Supply Voltage	Vcc	30	V
Power Dissipation	Pd	400	mW
Operating Temperature	Topr	-45 to 65	°C
Storage Temperature	Tstg	-65 to 150	°C

**ELECTRICAL CHARACTERISTICS**( Ta=25°C )

(All voltage referenced to GND unless otherwise specified)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Operating Supply Voltage	Vcc				29.0	V
Initiation Supply Voltage1	Vsi	See Fig.2	17	19	21	V
Initiation Supply Current1	Isi	RSL=100-200kΩPin 2 to Pin 1	1.4	2.5	4.2	mA
Sustaining Voltage2	Vsus	See Fig.2	9.7	11.0	12.0	V
Sustaining Current2	Isus	No Load Vcc=Vsus, See Fig.2	0.7	1.4	2.5	mA
Output Voltage High	VOH	Vcc=21V, I8=-15mA Pin6=6V, Pin7=GND	17.0	19.0	21.0	V
Output Voltage Low	VOL	Vcc=21V, I8=15mA Pin6=GND, Pin7=6V			1.6	V
IIN(Pin3)		Pin3=6V, Pin4=GND	—	—	500	nA
IIN(pin7)		Pin7=6V, Pin6=GND	—	—	500	nA
High Frequency 1	FH1	R3=191KΩ, C3=6800pF	461	512	563	Hz
High Frequency 2	FH2	R3=191KΩ, C3=6800pF	576	640	704	Hz
Low Frequency	FL	R2=165KΩ, C2=0.47μF	9.0	10	11.0	Hz

\*NOTE (See electrical characteristics sheet)

1. Initiation supply voltage (Vsi) is the supply voltage required to start the tone ringer oscillating.
2. Sustaining voltage (Vsus) is the supply voltage required to maintain oscillation.

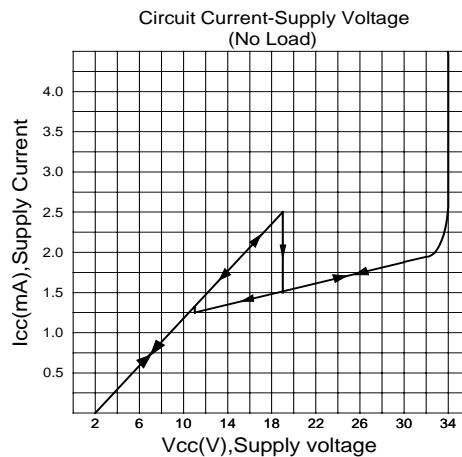


Fig.2

## APPLICATION NOTE

The application circuit illustrates the use of the UTC2410 device in typical telephone tone ringer application.

The AC ringer signal voltage appears across the TIP and RING inputs of the circuit and is attenuated by capacitor C1 and resistor R1.

C1 also provides isolation from DC voltage (48V) on the exchanged line.

After full wave rectification by the bridge diode, the wave form is filtered by capacitor C4 to provide a DC supply for the tone ringer chip.

As this voltage exceeds the initiation voltage (Vsi), oscillation starts.

With the components shown, the output frequency chops between 512Hz (FH1) and 640 Hz(FH2) at a 10 Hz(FL) rate. The application circuit illustrates the use of the UTC2410 device in typical telephone tone ringer application.

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The loudspeaker load is coupled through a 1300Ω to 8Ω transformer.

The output coupling capacitor C5 is required with transformer coupled loads.

When driving a piezo-ceramic transducer type load, the coupling C5 and transformer (1300Ω:8Ω) are not required.

However, a current limiting resistor is required.

The low frequency oscillator oscillates at a rate (FL) controlled by an external resistor (R2) and capacitor (C2).

The frequency can be determined using the relation  $FL=1/1.289 R2 \cdot C2$ . The high frequency oscillates at a FH1, FH2 controlled by an external resistor (R3) and capacitor (C3). The frequency can be determined using the relation  $FH1=1/1.504 R3 \cdot C3$  and  $FH2=1/1.203 R3 \cdot C3$ .

## APPLICATION CIRCUIT

