



LS1240A

LINEAR INTEGRATED CIRCUIT

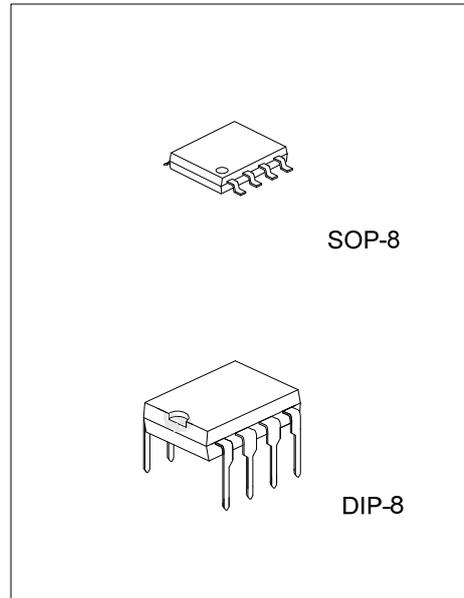
ELECTRONIC TONE RINGER WITH BUILT-IN BRIDGE RECTIFIER

DESCRIPTION

The UTC **LS1240A** is monolithic integrated circuits and designed to be as a telephone ringer. It can drive a piezo-ceramic converter(buzzer) directly. The output current capacity of UTC **LS1240A** is higher than standard ringer. For driving a dynamic loudspeaker, UTC **LS1240A** needs only a decoupling capacitor to replace the usual transformer in use.

FEATURES

- * Low current consumption.
- * Integrated rectifier bridge with zener diodes to overvoltage Protection.
- * Minimum external circuitry.
- * Both frequencies of tone and switching are adjustable by external components.
- * Integrated voltage and current hysteresis.



ORDERING INFORMATION

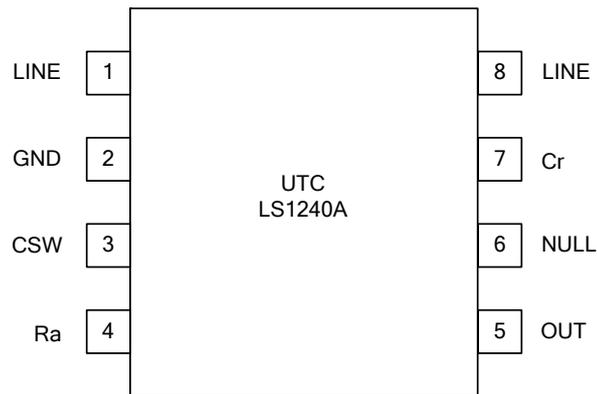
| Ordering Number | | Package | Packing |
|-----------------|----------------|---------|-----------|
| Lead Free | Halogen Free | | |
| LS1240AL-D08-T | LS1240AG-D08-T | DIP-8 | Tube |
| - | LS1240AG-S08-R | SOP-8 | Tape Reel |

| | |
|---|---|
| <p>LS1240AL-D08-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p> | <p>(1) T: Tube, R: Tape Reel (2) D08: DIP-8, S08: SOP-8 (3) L: Lead Free, G: Halogen Free and Lead Free</p> |
|---|---|

MARKING

| DIP-8 | SOP-8 |
|-------|-------|
| | |

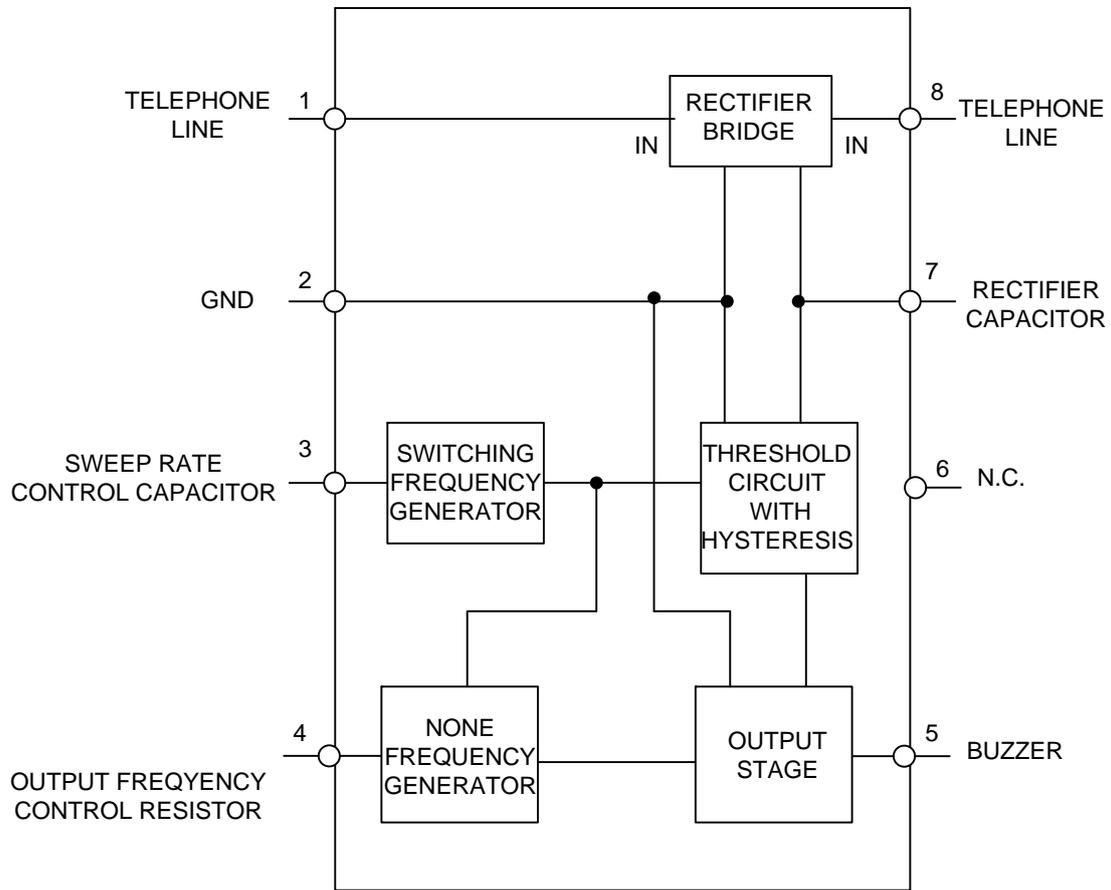
■ PIN CONFIGURATION



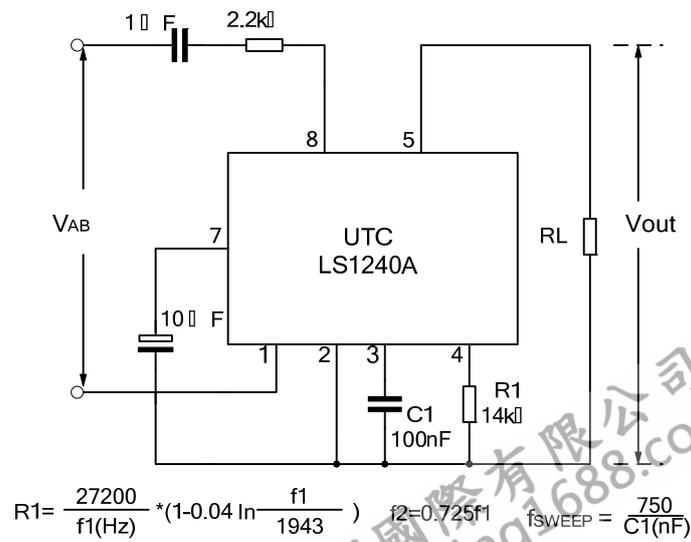
■ PIN DESCRIPTION

| PIN NO. | PIN NAME | DESCRIPTION |
|---------|----------|-----------------------------------|
| 1 | LINE | Connecting pin to B-wire |
| 2 | GND | Ground |
| 3 | Csw | Sweep rate control capacitor |
| 4 | Ra | Output frequency control resistor |
| 5 | OUT | Buzzer |
| 6 | NULL | Not connected |
| 7 | Cr | Rectifier capacitor |
| 8 | LINE | Connecting pin to A-wire |

■ BLOCK DIAGRAM



■ TEST CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | RATINGS | UNIT |
|--|-----------|------------|-----------|
| Calling Voltage (f=50Hz) Continuous | V_{AB0} | 120 | V_{RMS} |
| Calling Voltage (f=50Hz) (5s ON/10s OFF) | V_{AB} | 200 | V_{RMS} |
| Supply Current | I_{DC} | 30 | mA |
| Operating Temperature | T_{OPR} | -40 ~ +70 | °C |
| Storage Temperature | T_{STG} | -65 ~ +150 | °C |

Note Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

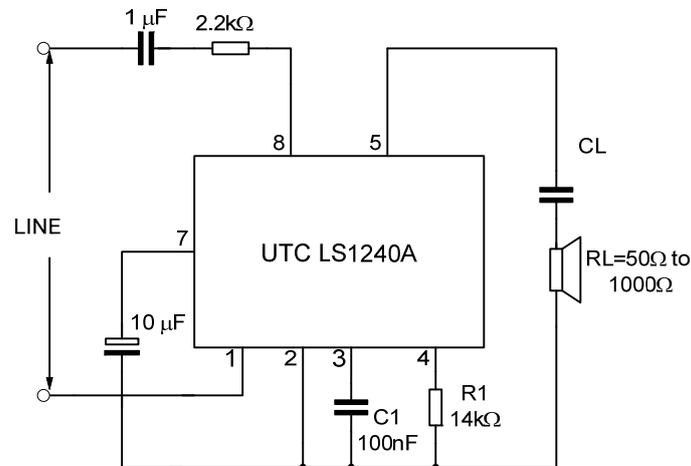
■ THERMAL DATA

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------|--------|---------|------|
| Junction to Ambient | SOP-8 | 150 | °C/W |
| | DIP-8 | 100 | |

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--|------------|---|------|---------|------|------------|
| Supply Voltage | V_S | | | | 26 | V |
| Current Consumption without load | I_B | $V_S=9.3$ to 25V | | 1.5 | 1.8 | mA |
| Activation Voltage | V_{ON} | | 12 | | 13.5 | V |
| Sustaining Voltage | V_{OFF} | | 7.8 | | 9.3 | V |
| Differential Resistance in OFF Condition | R_D | | 6.4 | | | k Ω |
| Output Voltage Swing | V_{OUT} | | | V_S-5 | | V |
| Short Circuit Current | I_{OUT} | $V_S=20\text{V}$, $R_L=250\Omega$ | | 70 | | mA |
| AC OPERATION | | | | | | |
| Output Frequencies ($V_S=26\text{V}$, $R_1=14\text{k}\Omega$) | f_{OUT1} | $V_3=0\text{V}$ | 1.55 | | 2.53 | kHz |
| | f_{OUT2} | $V_3=6\text{V}$ | 1.08 | | 1.9 | |
| f_{OUT1}/f_{OUT2} | | | 1.33 | | 1.43 | |
| Programming Resistor Range | | | 8 | | 56 | k Ω |
| Sweep Frequency | | $C_1=100\text{nF}$, $R_1=14\text{k}\Omega$ | 5.25 | 7.5 | 9.75 | Hz |

■ TYPICAL APPLICATION CIRCUIT



No current limitation is provided on the output stage of UTC **LS1240A**, so a minimum load DC of 50 ohms 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. The 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.

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