

MOTOROLA SEMICONDUCTORS

TOULOUSE FRANCE

MC34217

Advance Information

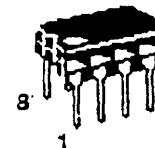
TELEPHONE TONE RINGER

- Complete Telephone Bell Replacement Circuit with Minimum External Components.
- On-Chip Diode Bridge and Transient Protection.
- Direct Drive for Piezoelectric Transducers.
- Push Pull Output Stage for Greater Output Power Capability.
- Base Frequency : 1 KHz
- Input Impedance Signature Meets Bell and EIA Standards.
- Reject Rotary Dial Transients.

TELEPHONE TONE RINGER BIPOLAR LINEAR/1²L

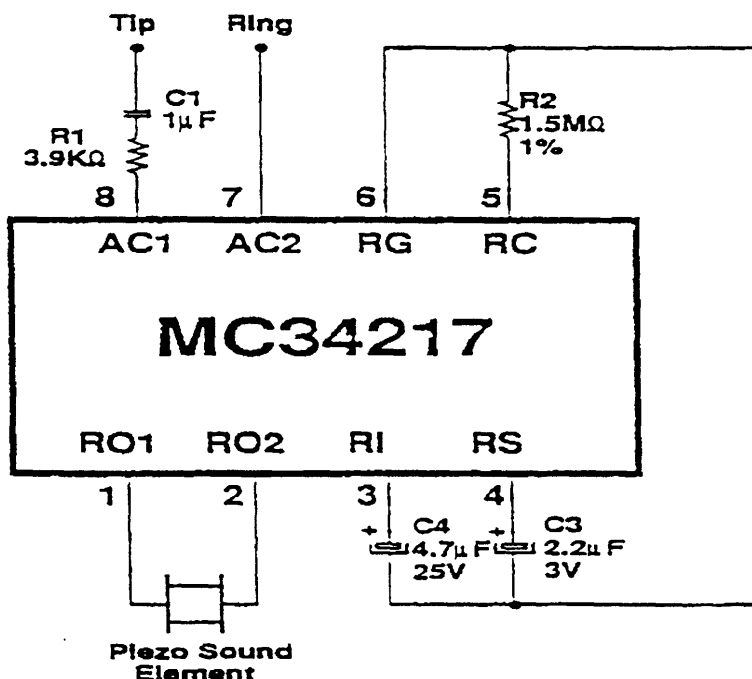


PLASTIC PACKAGE
CASE 751-03



PLASTIC PACKAGE
CASE 626-04

APPLICATION CIRCUIT



MAXIMUM RATINGS (Voltages referenced to RG. Pin 6)

Parameter	Value	Unit
Operating AC Input Current (Pins 7, 8)	20	mA, RMS
Transient Input Current (Pins 7, 8) ($T < 2\text{ms}$)	+/-300	mA, peak
Voltage applied at RC (Pin 5)	5.0	V
Voltage applied at RS (Pin 4)	5.0	V
Voltage applied to Outputs (Pins 1, 2)	-2.0 to VRI	V
Power Dissipation (@ 25°C)	1.0	W
Operating Temperature Range	-20 to +60	°C
Storage Temperature Range	-65 to +150	°C

PIN DESCRIPTION**Pin 1 RO1 , Pin 2 RO2**

The tone ringer output terminals through which the sound element is driven.

Pin 3 RI

The positive supply terminal for the oscillator , frequency divider and output buffer circuits.

Pin 4 RS

The input of the threshold comparator to which diode bridge current is mirrored and sensed through an internal resistor. Nominal threshold is 1.2 volts. This pin internally clamps at 1.5 volts.

Pin 5 RC

The oscillator terminal for the external resistor which controls the tone ringer frequencies (R2).

Pin 6 RG

The negative terminal of the diode bridge and the negative supply terminal of the tone generating circuit.

Pin 7 AC2 , Pin 8 AC1

The input terminals to the full-wave diode bridge. The AC ringing signal from the telephone line energizes the ringer through this bridge.



ELECTRICAL CHARACTERISTICS (TA = 25°C)

Parameter	Symbol	Fig	Min	Typ	Max	Unit
Ringing Start Voltage (figure 1) (Vstart = Vin @ Ring Start) (Vin > 0) (Vin < 0)	Vstart(+) Vstart(-)			23.5 -23.5	27 -27	Vdc
Ringing Stop Voltage (Vstop = Vin @ Ring Stop)	Vstop		10	12		Vdc
Output Frequencies(Vin = 50V) High Tone Low Tone Variable Tone	fh fl fw		880 705 11.25	1010 808 12.5	1130 915 14.25	Hz
Output Voltage (Vin = 50V)	Vo			25		Vp-p
Output Short-Circuit Current	Iro1,Iro2		35	60	80	mA
Input Diode Voltage (Iin = 5mA)	Vd			3.9		Vdc
Input Voltage SCR Off (Iin = 30mA)	Voff			21.5		Vdc
Input Voltage SCR On (Iin = 100mA)	Von		3.2	4.1	6.0	Vdc
RS Clamp Voltage (Vin = 50V)	Vclamp		1.4	1.7	2.0	Vdc



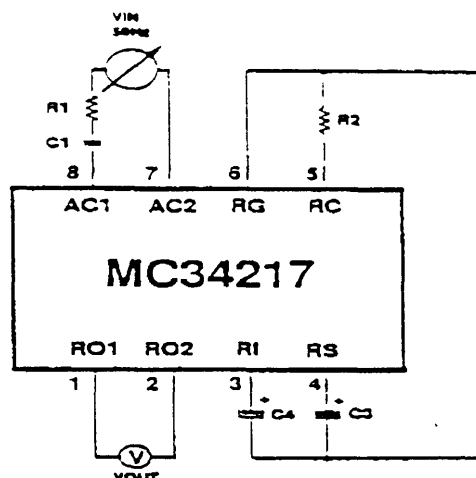
APPLICATION CIRCUIT PERFORMANCE (Refer to Circuit on First Page)

Characteristic	Typical Value	Unit
Output Tone Frequencies	808/1010	Hz
Warble Frequency	12.5	Hz
Output Voltage ($V_i > 60V_{rms}$, 20Hz)	25	Vp-p
Output Duty Cycle	50	%
Ringling Start Input Voltage (20Hz)	23.5	Vrms
Ringling Stop Input Voltage (20Hz)	12	Vrms
Maximum AC Input Voltage (<68Hz)	150	Vrms
Impedance When Ringling $V_i = 10V_{rms}$, 15Hz $V_i = 130V_{rms}$, 23Hz	>16 12	K Ω
Impedance When Not Ringling $V_i = 10V_{rms}$, 24Hz $V_i = 2.5V_{rms}$, 24Hz $V_i = 10V_{rms}$, 5.0Hz $V_i = 3.0V_{rms}$, 200-3200Hz	28 >1.0 55 >200	K Ω M Ω K Ω K Ω
Maximum Transient Input Voltage ($T < 2.0ms$)	1500	V
Ringer Equivalence : Class A Class B	0.5 0.9	



RINGING START /STOP VOLTAGE TEST

Figure 1



Test Method

Slowly increase 50Hz sine wave input amplitude while monitoring Vout, until Vout switches.

Measure Vin amplitude: This is the Ringing Start voltage.

Then decrease Vin until output stops switching. Measure Vin: This is the Ringing Stop voltage.

Note: If ringing start is measured by input loop circuit break technique, the start level would be lower.

Components Range

- | | |
|-----------|--|
| R1 | Line input resistor. R1 affects the tone ringer input impedance. It also influences ringing threshold voltage and limits current from line transients.
(Range: $3K\Omega$ to $10K\Omega$). |
| C1 | Line input capacitor. C1 ac couples the tone ringer to the telephone line and controls ringer input impedance at low frequencies
(Range: $0.4\mu F$ to $2.0\mu F$). |
| R2 | Oscillator resistor.
(Range: $500K\Omega$ to $2M\Omega$). |
| C3 | Ringing threshold filter capacitor. C3 filters the ac voltage across R3 at the input of the ringing threshold comparator. It also provides dialer transient rejection.
(Range: $0.5\mu F$ to $5\mu F$). |
| C4 | Ringer supply capacitor. C4 filters supply voltage for the tone generating circuits. It also provides an ac current path for the $10V_{rms}$ ringer signature impedance.
(Range: $1\mu F$ to $10\mu F$). |

