

Tone Ringer

GENERAL DESCRIPTION

The XR-T8205 Tone Ringer is primarily intended as a replacement for the mechanical telephone bell. The device can be powered directly from telephone AC ringing voltage or from a separate DC supply. An adjustable trigger level is provided with an external resistor.

The XR-T8205 is designed for nominal 15 volt operation and is available in an 8 pin DIL package.

FEATURES

- Low Supply Current
- Operates Directly From Telephone Line
- Provides Single or Dual Tone Frequencies to Simulate Mechanical Bell
- Operates from 15 to 30 Volts
- Pin-to-Pin Compatible with MITEL ML8205

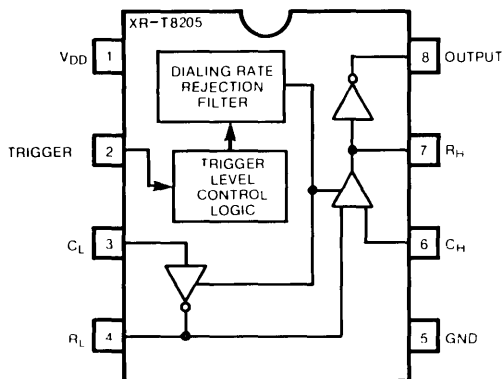
APPLICATIONS

- Electronic Telephones
- Alarm or Other Alerting Devices
- Power Line Indicator
- Toys

ABSOLUTE MAXIMUM RATINGS

Storage Temperature	-65°C to +150°C
Operating Temperature	0°C to 70°C
Supply Voltage	30 V
Input Voltage	$-3\text{ V} \leq V_{IN} \leq V_{DD} + 3\text{ V}$

FUNCTIONAL BLOCK DIAGRAM



ORDERING INFORMATION

Part Number	Package	Operating Temperature
XR-T8205CP	Plastic	0°C to 70°C
XR-T8205P	Plastic	0°C to 70°C

SYSTEM DESCRIPTION

The XR-T8205 Tone Ringer consists of two oscillator circuits, a dial reject filter and an amplifier to drive high impedance audio transformer or piezo-electric transducers.

The power supply control circuit provides the hysteresis required to ensure positive triggering of the device and to prevent transient triggering due to dial pulsing.

As the power supply voltage to the XR-T8205 is increased up to the supply initiation voltage (V_{SI}), oscillation begins. The low frequency oscillator oscillates at a rate of F_L controlled by an external resistor and capacitor, connected between Pins 3 and 4. The output of F_L is internally connected to the switching threshold circuitry of the high frequency oscillator.

XR-T8205

ELECTRICAL CHARACTERISTICS

Test Conditions: $V_{DD} = 17\text{ V}$ $T_A = 25^\circ\text{C}$, unless specified otherwise.

SYMBOL	PARAMETERS	MIN.	TYP.	MAX.	UNIT	CONDITIONS
V_{DD}	Operating Supply Voltage	15	17	30	V	
I_D	Operating Current	.7	1.2		mA	No Load
I_S	Supply Initiation Current	1.4	2.5	4.2	mA	No Load, $R_T = 6.8\text{ k}\Omega$
I_T	Trigger Current	10	20	1000	μA	
V_O	Output Voltage	17	19	21	V	No Load, $V_{DD} = 21\text{ V}$
Δf_o	Oscillator Frequency Tolerance			10	%	

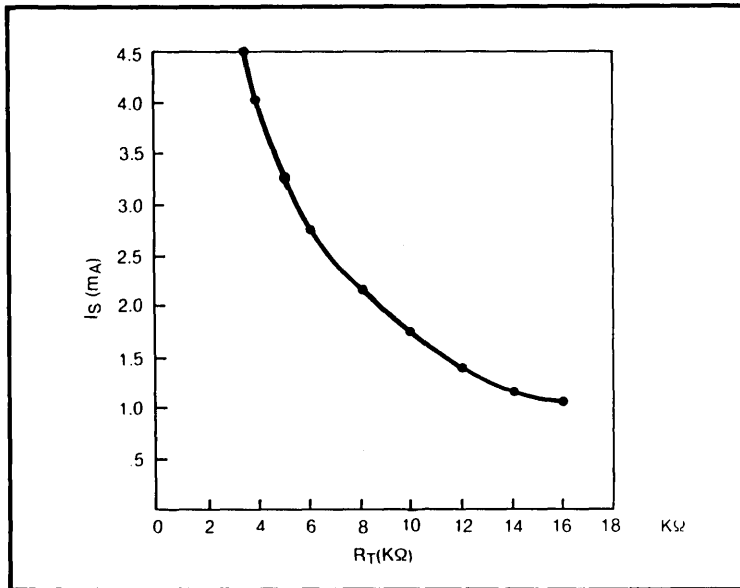


Figure 1. Supply Initiation Current (I_S) VS R_T

PIN AND FUNCTION DESCRIPTION

Pin	Number
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Supplies

V _{DD} , GND	1, 5
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Power supply inputs — the device is designed to operate from 15 to 30 volts.

Trigger In	2
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This pin is provided to adjust power supply initiation current.

Rate Oscillator	3, 4
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R_L, C_L Low frequency oscillator external components. Oscillation rate is determined using the relation $F_L = 1/(1.234 R_L C_L)$ where R is the value of the resistor connected between Pin 3 and 4, and C is the value of the capacitor connected between Pin 3 to Ground.

Ring Oscillator	6, 7
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C_H, R_H High frequency oscillator external components. When the output of the rate oscillator is high, the high frequency oscillator oscillates at its normal rate, describes by the relation $F_H = 1/(1.515 R_H C_H)$ where R is the value of the resistor connected between Pins 6 and 7, and C is the value of the capacitor connected between Pin 6 to Ground. When the output of rate oscillator is low, high frequency oscillator oscillation changes to $F_H = 1.25 F_L$.

Output	8
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The output amplifier of the XR-T8205 is capable of driving a wide range of load impedances, when driven from a low source impedance power supply.

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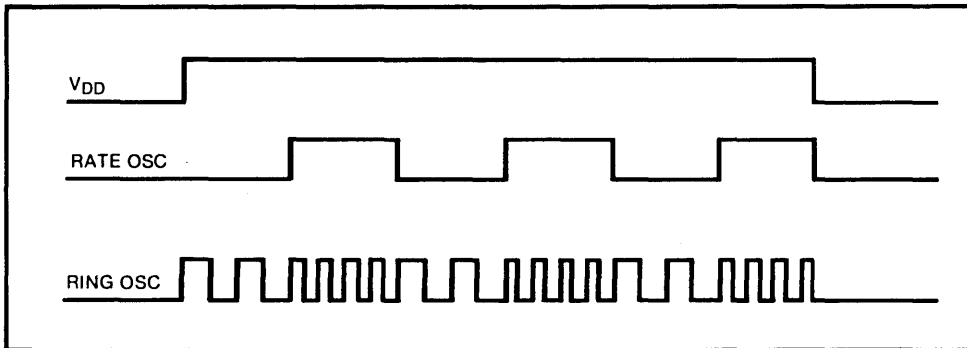


Figure 2. Ring and Rate Oscillator Relationship

XR-T8205

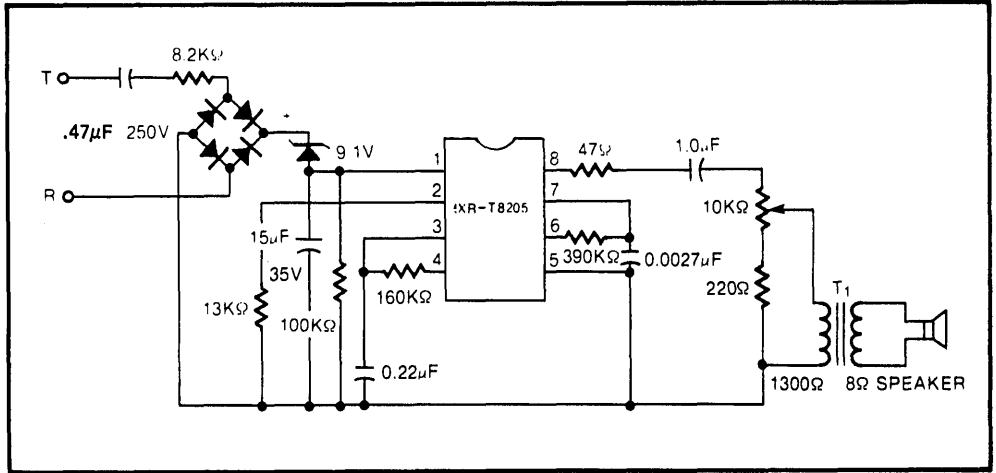


Figure 3. Typical Line Powered Tone Ringer Circuit

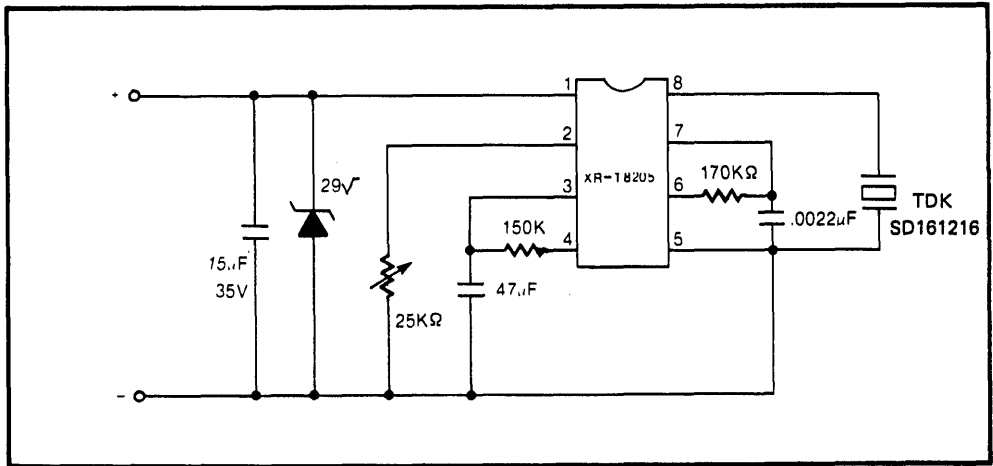


Figure 4. Typical Tone Ringer Circuit Using Piezo-Electric