



KA2410/KA2411

TELEPHONE TONE RINGERS

DESCRIPTION

THE **KA2410/2411** IS A BIPOLAR INTEGRATED CIRCUIT DESIGNED FOR TELEPHONE TONE RINGER. THESE DEVICES CONSISTS OF AN OUTPUT AMPLIFIER, TWO OSCILLATORS, AND POWER SUPPLY CONTROL CIRCUIT.

FEATURES

- ♦ Low current drain
- ♦ Adjustable 2 tone frequency
- ♦ Hysteresis circuit prevents false triggering and rotary dial "CHIRPS"
- ♦ 8 pin DIP plastic package
- ♦ External triggering or ringer disables (KA2410)
- ♦ Adjustable for reduced supply initiation current (KA2411)

8-pin DIP



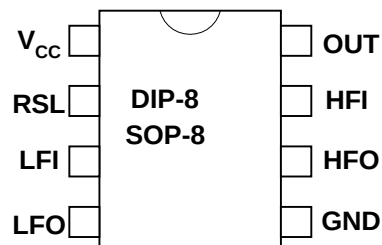
APPLICATIONS

- ♦ Telephone bell replacement
- ♦ Extension tone ringer modules
- ♦ Alarms or other alerting devices

PIN ASSIGNMENT

PIN	NAME	FUNCTION
1	V _{CC}	Power Supply
2	RSL	Resistor Select
3	LFI	Low freq. osc. Input
4	LFO	Low freq. osc. Output
5	GND	Ground
6	HFO	High freq. osc. Output
7	HFI	High freq. osc. Input
8	OUT	Output

PIN CONFIGURATION (TOP VIEW)



ABSOLUTE MAXIMUM RATINGS

Voltage values are with respect to the anode terminal unless otherwise noted

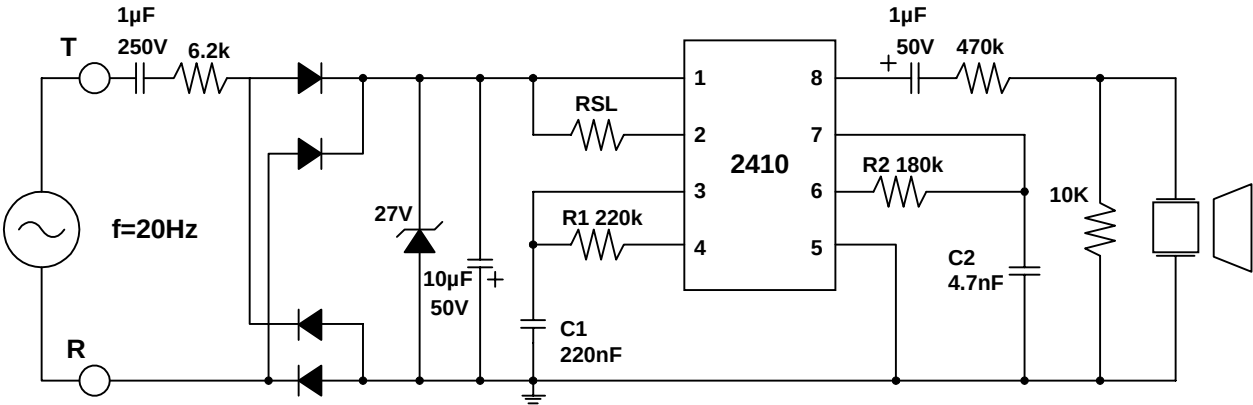
PARAMETER	SYMBOL	RATING	UNITS
DC Supply Voltage	V _{CC}	36	V
Power Dissipation	P _D	450	mW
Operating Ambient Temperature Range	T _A	-25~+75	°C
Storage Temperature Range	T _{STG}	-65~+150	

ELECTRICAL CHARATERISTICS (V_{CC}=24V, T_A=25°C, UNLESS OTHERWISE NOTED)

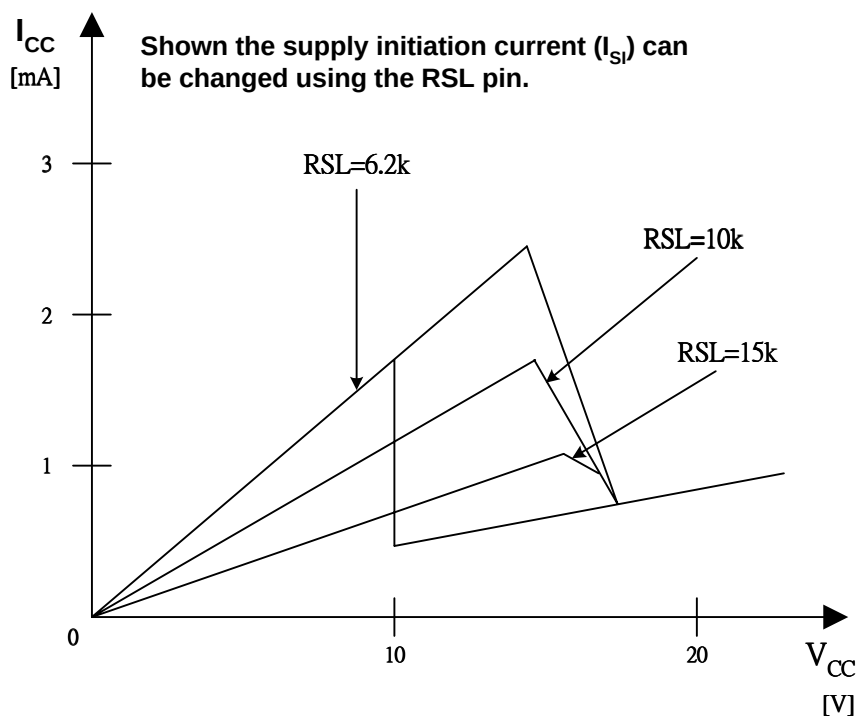
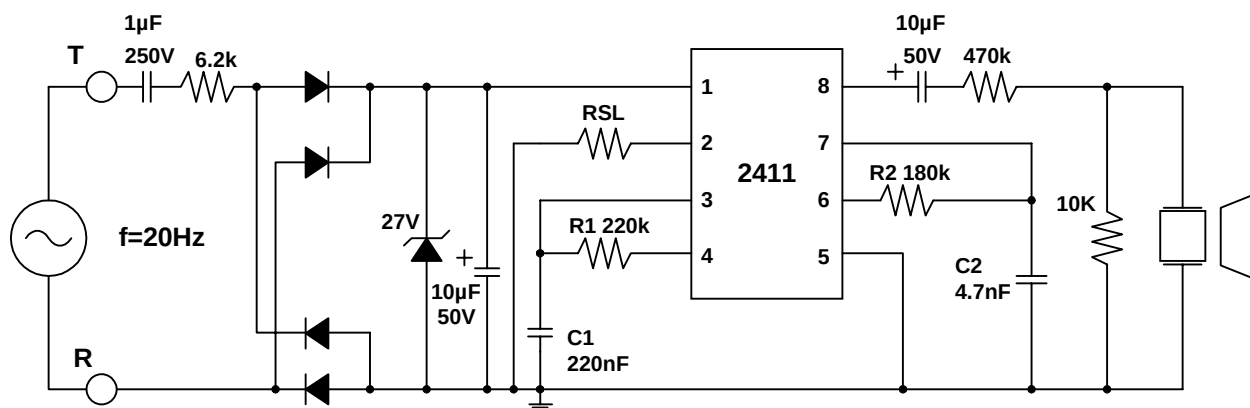
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V _{CC}				36	V
Supply Initiation Voltage	V _{SI}		17	19	21	
Current	I _{SI}	V _{CC} =V _{SI} , No load #1	1.4	2.5	4.2	
Sustaining Voltage	V _{SUS}		9.7	10.5	12	V
Current	I _{SUS}	V _{CC} =V _{SUS} , No load #2	0.2	0.9	2.5	mA
Oscillator Freq. #3	f _L	R1=165kΩ, C1=0.47μf	9	10	11	Hz
Oscillator Freq. #3	f _{H1}	R2=191kΩ, C2=6800pF	461	512	563	Hz
Oscillator Freq. #3	f _{H2}	R2=191kΩ, C2=6800pF	576	640	703	Hz
Output		V _{CC} =21V				
		I _{OH} =15mA				
High Voltage	V _{OH}		17.7	19	21.5	V
Low Voltage	V _{OL}	I _{OL} =15mA			1.6	
Trigger		V _{CC} =15V	8.5		10.5	V
		KA2410 Only (2 pin)		20	1000	μA
Disable						
				0.4	0.8	V
Voltage	V _{DIS}					
Current #6	I _{DIS}	KA2410 Only (2 pin)	-40	-20		μA

- #1. Supply initiation voltage is the value of DC supply voltage required to start the tone ringer oscillating.
- #2. Sustaining voltage is the value of DC supply voltage required to maintain the oscillation.
- #3. Oscillator frequency is determined by the following equations:
 $f_L = 1/(1.359XR1XC1)(Hz)$
 $f_{H1} = 1/(1.518XR2XC2)(Hz)$
 $f_{H2} = 1.214Xf_{H1} (Hz)$
- #4. V_{TR} and I_{TR} the conditions applied to trigger input to start oscillation for V_{SUS} ≤ V_{CC} ≤ V_{SI}.
- #5. Trigger current must be limited to this value externally.
- #6. V_{DIS} and I_{DIS} are the conditions applied to trigger input to inhibit oscillation for V_{SI} ≤ V_{CC}.

APPLICATION CIRCUIT FOR 2410

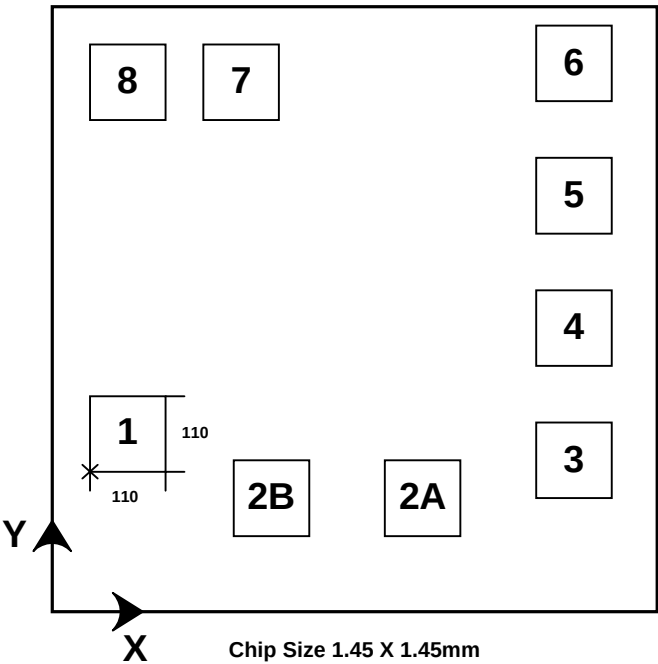


APPLICATION CIRCUIT FOR 2411



Use of RSL pin (for KA2411 only)

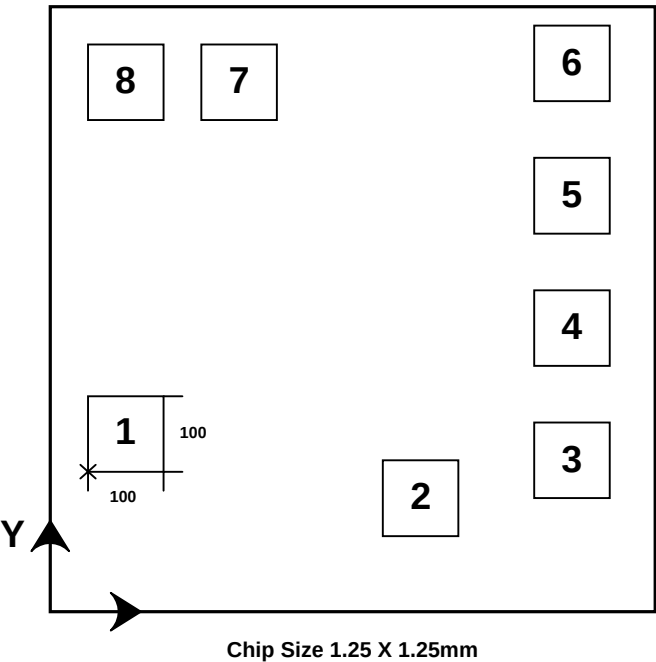
Pad Location KA2410 / KA2411



For KA2410 2A pad to be used, 2B pad not connected;
For KA2411 2B pad to be used, 2A pad not connected.

Pad N	Pad Name	Coordinates	
		X (μm)	Y (μm)
1	V _{cc}	95	270
2A	RSL	925	90
2B		690	90
3	LFI	1245	90
4	LFO	1245	490
5	GND	1245	765
6	HFO	1245	1185
7	HFI	460	1185
8	OUT	95	1185

Pad Location KA2410 / KA2411 (new design)



Pad N	Pad Name	Coordinates	
		X (μm)	Y (μm)
1	V _{CC}	75	250
2	RSL	640	81
3	LFI	1095	81
4	LFO	1095	469
5	GND	1095	731
6	HFO	1095	1037
7	HFI	447	1037
8	OUT	75	1037