

**LOW VOLTAGE AUDIO AMPLIFIER**

The KA8602 is an audio power amplifier available for low voltage. This amplifier supplies differential outputs for maximizing output swing at low voltages. The KA8602 doesn't need coupling capacitors to the speaker. The gain of this amp is controlled easily by two external resistors.

**FEATURES**

- **Wide Supply Voltage:**  $V_{CC} = 2V \sim 16V$
- **Low Quiescent Supply Current** ( $I_{CCQ} = 3mA$ )
- **Easy Gain Control**
- **Medium Output Power**  
 $P_O = 250mW$  at  $V_{CC} = 6V$ ,  $R_L = 32\Omega$ ,  $THD = 10\%$
- **Minimum External Parts**
- **Load Impedance Range** ( $8\Omega \sim 100\Omega$ )
- **Low Distortion**
- **Mute Function** ( $I_{CC} = 75\mu A$ )

**BLOCK DIAGRAM**

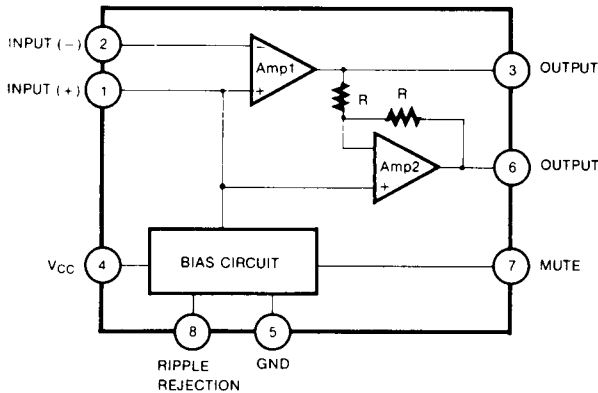
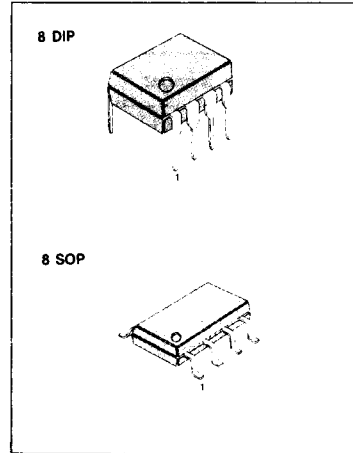
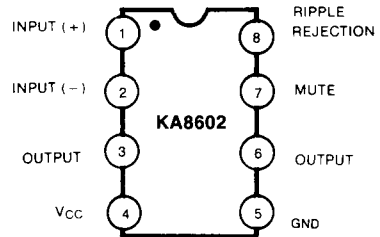


Fig. 1



**ORDERING INFORMATION**

Device	Package	Operating Temperature
KA8602N	8DIP	- 20°C ~ + 70°C
KA8602D	8SOP	



## PIN DESCRIPTION

Pin No.	Symbol	Description
1	Input (+)	Analog Ground for the amplifiers. A $1.0\mu\text{F}$ capacitor at this pin (with a $5.0\mu\text{F}$ capacitor at pin 8) provides 52dB (Typ) of power supply rejection. Turn-on time of the circuit is affected by the capacitor on this pin. This pin can be used as an alternate input.
2	Input (-)	Amplifier input. The input capacitor and resistor set low frequency rolloff and input impedance. The feedback resistor is connected to this pin and output.
3	Output	Amplifier 1's output. The DC Level is $\approx (V_{\text{CC}} - 0.7\text{V})/2$
4	$V_{\text{CC}}$	DC supply voltage (+2.0 ~ +16V) is applied to this pin.
5	GND	Ground pin.
6	Output	Amplifier 2's output. This signal is equal in amplitude, but $180^\circ$ out of phase with that at output pin. The DC level is $\approx (V_{\text{CC}} - 0.7\text{V})/2$ .
7	Mute	This pin can be used to power down the IC to conserve power, or for muting, or both. When at a logic "Low" (0 to 0.8 volts), the KA8602 is enabled for normal operation. When at a logic "High" (2.0 to $V_{\text{CC}}$ volts), the IC is disabled. If Mute is open, that is equivalent to a logic "Low".
8	Ripple Rejection	A capacitor at this pin increases power supply rejection, and affects turn-on time. This pin can be left open if the capacitor at pin 1 is sufficient.

## ABSOLUTE MAXIMUM RATINGS

Characteristics	Symbol	Value	Unit
Supply Voltage	$V_{CC}$	-1.0 ~ +18	V
Output Current (output pin)	$I_O$	±250	mA
Maximum Voltage (input, RR, Mute pin)	$V_{IM(DC)}$	-1.0 ~ $V_{CC} + 1.0$	V
Applied Output Voltage (output pin) when disabled	$V_O$	-1.0 ~ $V_{CC} + 1.0$	V
Junction Temperature	$T_J$	-55 ~ +140	°C

## ELECTRICAL CHARACTERISTICS

(V<sub>CC</sub> = 6 V, T<sub>a</sub> = 25°C, unless otherwise noted)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit	
<b>DC ELECTRICAL CHARACTERISTICS</b>							
Quiescent Circuit Current (R <sub>L</sub> = 0)	$I_{CCO}$	V <sub>CC</sub> = 3.0V, Mute = 0.8V		2.7	4.0	mA	
		V <sub>CC</sub> = 16.0V, Mute = 0.8V		3.3	5.0	mA	
		V <sub>CC</sub> = 3.0V, Mute = 2.0V		65	100	μA	
Output Voltage (output Pin)	$V_O$	R <sub>L</sub> = 16Ω R <sub>T</sub> = 75KΩ	V <sub>CC</sub> = 3.0V V <sub>CC</sub> = 6.0V V <sub>CC</sub> = 12.0V	1.0	1.15 2.65 5.65	1.25	V
Output Offset Voltage	$V_{OO}$	V <sub>CC</sub> = 6.0V, R <sub>T</sub> = 75KΩ, R <sub>L</sub> = 32Ω	-30	0	+30	mV	
Output High Voltage	$V_{OH}$	2.0V ≤ V <sub>CC</sub> ≤ 16V, I <sub>out</sub> = -75mA		V <sub>CC</sub> - 1.0		V	
Output Low Voltage	$V_{OL}$	2.0V ≤ V <sub>CC</sub> ≤ 16V, I <sub>out</sub> = 75mA		0.16		V	
Input Bias Current (pin 2)	$I_M$			-100	-200	mA	
Equipment Resistance	$R_E$	pin 1	100	150	220	KΩ	
		pin 8	18	25	40		
Mute	Input Low Voltage	$V_{IL(MUTE)}$			0.8	V	
	Input High Voltage	$V_{IH(MUTE)}$	2.0			V	
	Input Resistance	$R_{L(MUTE)}$	V <sub>CC</sub> = Mute = 16V	50	90	175	KΩ
<b>AC ELECTRICAL CHARACTERISTICS</b>							
Open Loop Voltage Gain (Amp 1)	$G_{VO}$		80			dB	
Closed Loop Voltage Gain (Amp 2)	$G_{VC}$	f = 1.0KHz, R <sub>L</sub> = 32Ω	-0.35	0	+0.35	dB	
Output Power	$P_O$	V <sub>CC</sub> = 3.0V, R <sub>L</sub> = 16Ω, THD ≤ 10%	55			mW	
		V <sub>CC</sub> = 6.0V, R <sub>L</sub> = 32Ω, THD ≤ 10%	250				
		V <sub>CC</sub> = 12V, R <sub>L</sub> = 100Ω, THD ≤ 10%	400				
Total Harmonic Distortion (f = 1.0 KHz)	THD	V <sub>CC</sub> = 6.0V, R <sub>L</sub> = 32Ω, P <sub>O</sub> = 125mW		0.5	1.0	%	
		V <sub>CC</sub> ≤ 3.0V, R <sub>L</sub> = 8Ω, P <sub>O</sub> = 20mW		0.5			
		V <sub>CC</sub> ≤ 12V, R <sub>L</sub> = 32Ω, P <sub>O</sub> = 200mW		0.6			
Gain Bandwidth Product	GBW			1.5		MHz	
Power Supply Rejection Ratio (V <sub>CC</sub> = 6.0V, ΔV <sub>CC</sub> = 3.0V)	PSRR	C <sub>1</sub> = ∞, C <sub>2</sub> = 0.01μF	50			dB	
		C <sub>1</sub> = 0.1μF, C <sub>2</sub> = 0, f = 1.0KHz		12			
		C <sub>1</sub> = 1.0μF, C <sub>2</sub> = 5.0μF, f = 1.0KHz		52			
Muting	MUTE	Mute = 2.0V, 1.0KHz ≤ f ≤ 20KHz		>70		dB	

APPLICATION CIRCUIT

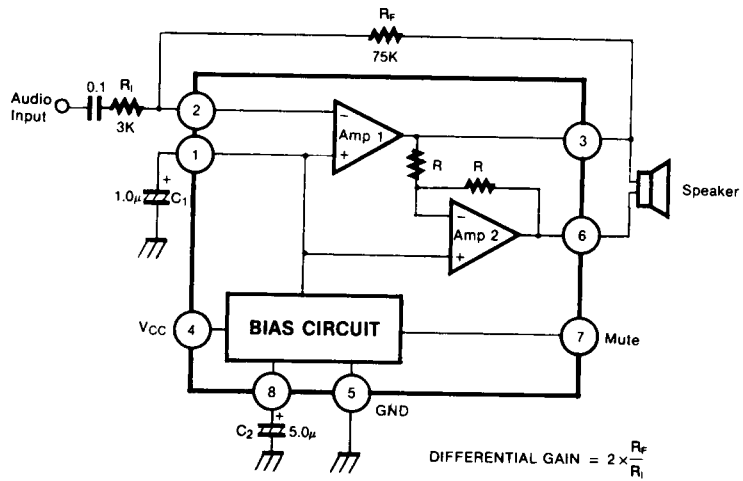


Fig. 2

This datasheet has been download from:

[www.datasheetcatalog.com](http://www.datasheetcatalog.com)

Datasheets for electronics components.