



# KA8602

## LINEAR INTEGRATED CIRCUIT

### LOW VOLTAGE AUDIO POWER AMPLIFIER

■ DESCRIPTION

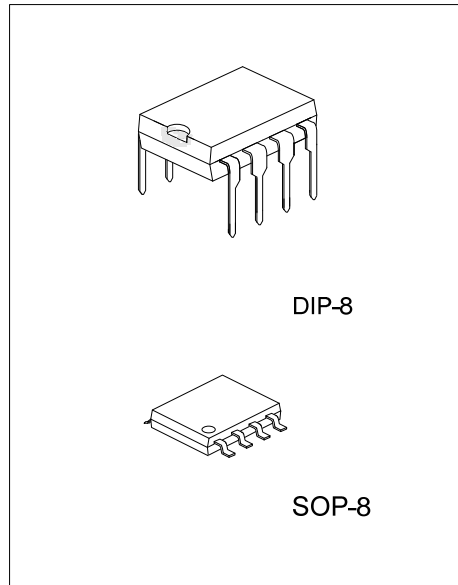
The UTC **KA8602** is the audio power amplifier available for low voltage. The UTC **KA8602** supplies differential outputs for maximizing output swing at low voltages. The UTC **KA8602** does not need coupling capacitors to the speaker. The gain of this amplifier is controlled easily by two external resistors.

■ FEATURES

- \*Wide operating supply voltage:  $V_{CC}=2V\sim 16V$
- \*Low quiescent supply current(  $I_{CC}=2.7mA$ , typ)
- \*Medium output power ( $P_{OUT}=250mW$  at  $V_{CC}=6V$ ,  $R_L=32ohm$ , THD=10%)
- \*Load impedance range: 8~100ohm
- \*Mute function ( $I_{CC}=65\mu A$ , typ)
- \*Minimum number of external parts required.
- \*Low distortion

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
KA8602G-D08-T	KA8602G-D08-T	DIP-8	Tube
-	KA8602G-S08-R	SOP-8	Tape Reel



<p>KA8602L-S08-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) T: Tube, R: Tape Reel</li> <li>(2) D08: DIP-8, S08: SOP-8</li> <li>(3) L: Lead Free, G: Halogen Free and Lead Free</li> </ul>
----------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------

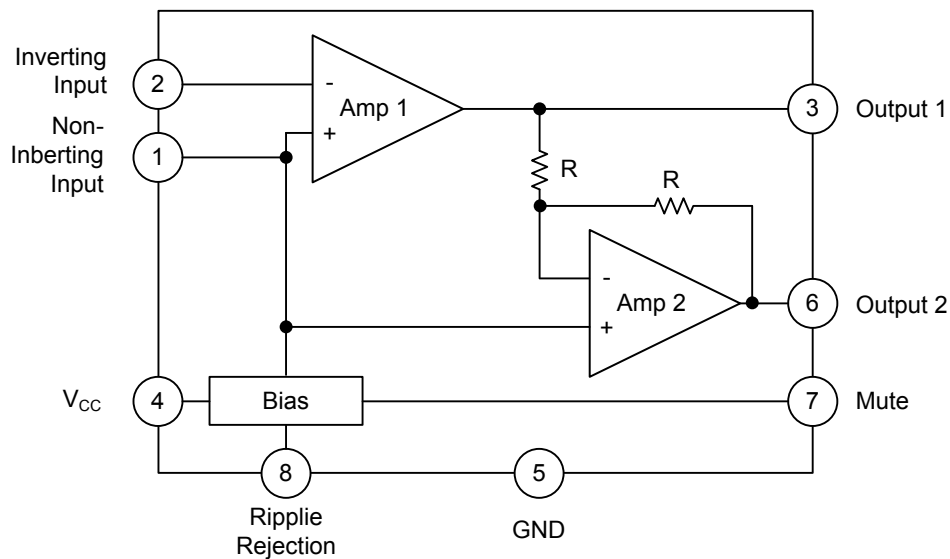
■ MARKING

DIP-8	SOP-8

## ■ PIN CONFIGURATIONS

PIN	NAME	DESCRIPTION
1	Input(+)	Analog Ground for the amplifiers. A 1 $\mu$ F capacitor at this pin (with a 5 $\mu$ 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 alternative input.
2	Input(-)	Amplifier input. The input capacitor and resistor set low frequency roll-off and input impedance. The feedback resistor is connected between this pin and output 1.
3	Output 1	Amplifier 1's output. The DC level is about $(V_{CC}-0.7V)/2$ .
4	V <sub>CC</sub>	DC supply voltage is applied to this pin ( $V_{CC}=2\sim 16V$ ).
5	GND	Ground pin.
6	Output 2	Amplifier 2's output. This signal is equal in amplitude, but 180 $^{\circ}$ out of phase with that output 1, the DC level is about $(V_{CC}-0.7V)/2$ .
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" (less than 0.8V), the IC is enabled for normal operation. When at a logic "HIGH" (2V to V <sub>CC</sub> ), the IC is disabled. If Mute is open, that is equivalent to a logic "LOW".
8	Ripple Rejection	A capacitor at this pin increase power supply rejection, and affects turn-on time. This pin can be left open if the capacitor at pin 1 is sufficient.

## ■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>CC</sub>	-1~18	V
Output Current	I <sub>OUT</sub>	+250	mA
Maximum Input, Ripple Rejection, Mute Pin Voltage	V <sub>I(max)</sub>	-1~V <sub>CC</sub> +1	V
Applied Output Voltage( Output Pin When Disabled)	V <sub>OUT</sub>	-1~V <sub>CC</sub> +1	V
Temperature Junction	T <sub>J</sub>	-55 ~ +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.

■ RECOMMENDED OPERATION CONDITIONS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>CC</sub>	2~16	V
Voltage at Mute	V <sub>I(MUTE)</sub>	0~V <sub>CC</sub>	V
Peak Load Current	I <sub>L(PEAK)</sub>	±200	mA
Load Impedance	Z <sub>L</sub>	8~100	Ω
Differential Gain (5KHz Bandwidth)	ΔG <sub>V</sub>	0~46	dB
Ambient Temperature	T <sub>A</sub>	-20~+70	°C

■ ELECTRICAL CHARACTERISTICS (V<sub>CC</sub>=6V, T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>DC PARAMETER</b>						
Operating Current	I <sub>CC</sub>	V <sub>CC</sub> =3V, Mute=0.8V		2.7	4	mA
		V <sub>CC</sub> =16V, Mute=0.8V		3.3	5	mA
		V <sub>CC</sub> =3V, Mute=2V		65	100	μA
Output Voltage	V <sub>OUT</sub>	V <sub>CC</sub> =3V, R <sub>L</sub> =16Ω, R <sub>1</sub> =75KΩ	1	1.15	1.25	V
		V <sub>CC</sub> =6V, R <sub>L</sub> =16Ω, R <sub>1</sub> =75KΩ		2.65		V
		V <sub>CC</sub> =12V, R <sub>L</sub> =16Ω, R <sub>1</sub> =75KΩ		5.65		V
Output Offset Voltage	V <sub>O(OFF)</sub>	V <sub>CC</sub> =6V, R <sub>F</sub> =75KΩ, R <sub>L</sub> =32Ω	-30	0	30	mV
Output High Level	V <sub>OH</sub>	2V<V <sub>CC</sub> <16V, I <sub>OUT</sub> =-75mA		V <sub>CC</sub> -1		V
Output Low Level	V <sub>OL</sub>	2V<V <sub>CC</sub> <16V, I <sub>OUT</sub> =75mA		0.16		V
Input Bias Current	I <sub>I(BIAS)</sub>			-100	-200	nA
Equivalent Resistance	R <sub>EQ</sub>	Pin 1	100	150	220	KΩ
		Pin 8	18	25	40	KΩ
<b>AC PARAMETER</b>						
Open Loop Gain of Amp. 1	Gv1		80			dB
Open Loop Gain of Amp. 2	Gv2	f=1KHz, R <sub>L</sub> =32Ω	-0.35	0	0.35	dB
Output Power	P <sub>OUT</sub>	V <sub>CC</sub> =3V, R <sub>L</sub> =6Ω, THD<10%	55			mW
		V <sub>CC</sub> =6V, R <sub>L</sub> =32Ω, THD<10%	250			mW
		V <sub>CC</sub> =12V, R <sub>L</sub> =100Ω, THD<10%	400			mW
Total Harmonic Distortion (f=1KHz)	THD	V <sub>CC</sub> =6V, R <sub>L</sub> =32Ω, P <sub>OUT</sub> =125mW		0.5	1	%
		V <sub>CC</sub> <3V, R <sub>L</sub> =8Ω, P <sub>OUT</sub> =20mW		0.5		%
		V <sub>CC</sub> <12V, R <sub>L</sub> =32Ω, P <sub>OUT</sub> =200mW		0.6		%
Gain Bandwidth Product	GBW			1.5		MHz
Power Supply Rejection (V <sub>CC</sub> =6V, ΔV <sub>CC</sub> =3V)	PSRR	C1=∞, C2=0.01μF	50			dB
		C1=0.1μF, C2=0, f=1KHz		12		dB
		C1=1μF, C2=5μF, f=1KHz		52		dB
Muting	G <sub>V(MUTE)</sub>	Mute=2V, 1KHz<f<20KHz	70			dB

## APPLICATION CIRCUIT

