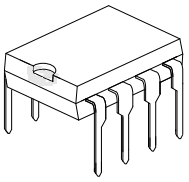
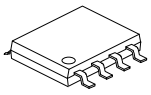
LOW VOLTAGE AUDIO POWER AMPLIFIER



DIP-8



SOP-8

■ 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~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}=65μA, typ)
*Minimum number of external parts required.
*Low distortion

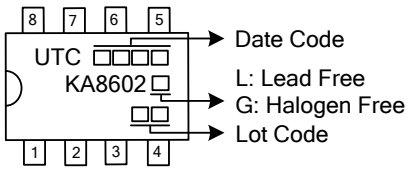
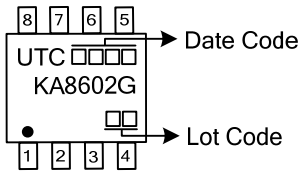
■ ORDERING INFORMATION

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

KA8602L-S08-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) T: Tube, R: Tape Reel
(2) D08: DIP-8, S08: SOP-8
(3) L: Lead Free, G: Halogen Free and Lead Free

■ MARKING

DIP-8	SOP-8
	

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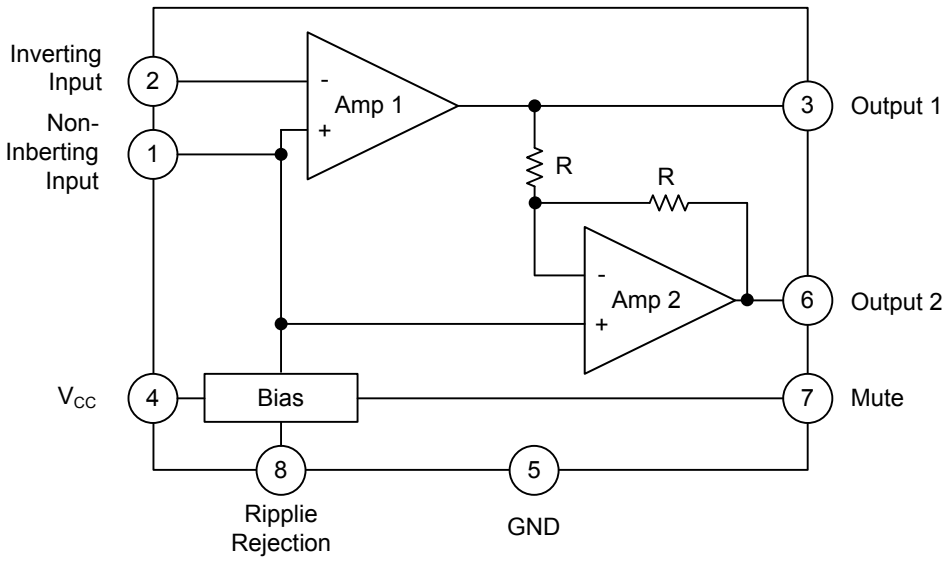
■ PIN CONFIGURATIONS

PIN	NAME	DESCRIPTION
1	Input(+)	Analog Ground for the amplifiers. A 1μF capacitor at this pin (with a 5μF 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_{CC}	DC supply voltage is applied to this pin (V_{CC}=2~16V).
5	GND	Ground pin.
6	Output 2	Amplifier 2's output. This signal is equal in amplitude, but 180℃ 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 converse 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_{CC}), 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_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-1~18	V
Output Current	I_{OUT}	+-250	mA
Maximum Input, Ripple Rejection, Mute Pin Voltage	V_I(max)	-1~Vcc+1	V
Applied Output Voltage(Output Pin When Disabled)	V_{OUT}	-1~Vcc+1	V
Temperature Junction	T_J	-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.

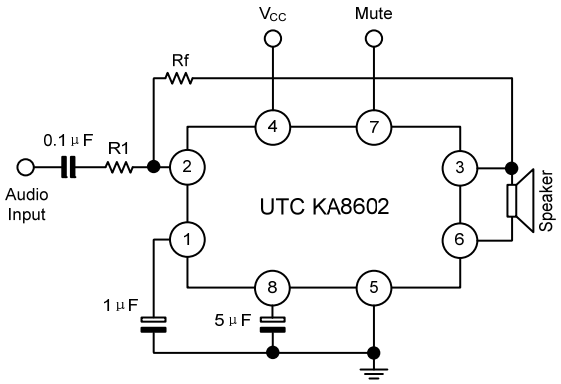
■ RECOMMENDED OPERATION CONDITIONS (T_A=25°C, unless otherwise specified)

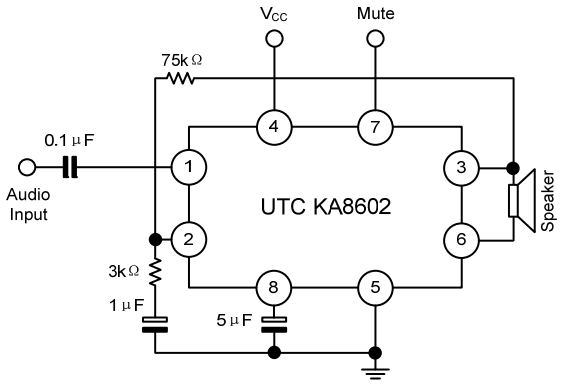
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	2~16	V
Voltage at Mute	$V_{I(MUTE)}$	0~Vcc	V
Peak Load Current	$I_{L(PEAK)}$	±200	mA
Load Impedance	Z_L	8~100	Ω
Differential Gain (5KHz Bandwidth)	ΔG_V	0~46	dB
Ambient Temperature	T_A	-20~+70	°C

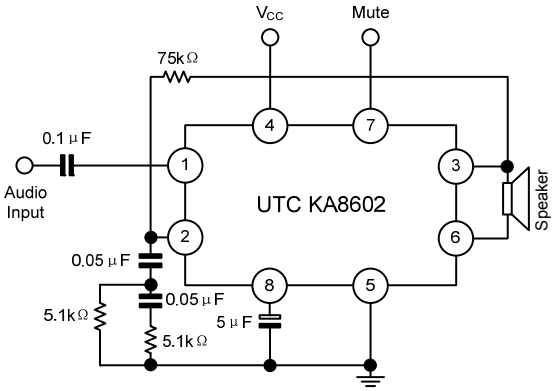
■ ELECTRICAL CHARACTERISTICS (V_{CC}=6V, T_A=25℃, unless otherwise specified)

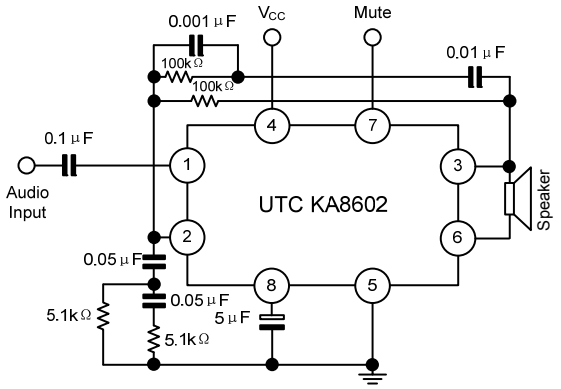
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
DC PARAMETER						
Operating Current	I_{CC}	V_{CC}=3V, Mute=0.8V		2.7	4	mA
		V_{CC}=16V, Mute=0.8V		3.3	5	mA
		V_{CC}=3V, Mute=2V		65	100	μA
Output Voltage	V_{OUT}	V_{CC}=3V, R_L=16Ω, R1=75KΩ	1	1.15	1.25	V
		V_{CC}=6V, R_L=16Ω, R1=75KΩ		2.65		V
		V_{CC}=12V, R_L=16Ω, R1=75KΩ		5.65		V
Output Offset Voltage	$V_{O(OFF)}$	V_{CC}=6V, R_F=75KΩ, R_L=32Ω	-30	0	30	mV
Output High Level	V_{OH}	2V<V_{CC}<16V, I_{OUT}=-75mA		Vcc~1		V
Output Low Level	V_{OL}	2V<V_{CC}<16V, I_{OUT}=75mA		0.16		V
Input Bias Current	$I_{I(BIAS)}$			-100	-200	nA
Equivalent Resistance	R_{EQ}	Pin 1	100	150	220	KΩ
		Pin 8	18	25	40	KΩ
AC PARAMETER						
Open Loop Gain of Amp. 1	Gv1		80			dB
Open Loop Gain of Amp. 2	Gv2	f=1KHz, R_L=32Ω	-0.35	0	0.35	dB
Output Power	P_{OUT}	V_{CC}=3V, R_L=6Ω, THD<10%	55			mW
		V_{CC}=6V, R_L=32Ω, THD<10%	250			mW
		V_{CC}=12V, R_L=100Ω, THD<10%	400			mW
Total Harmonic Distortion (f=1KHz)	THD	V_{CC}=6V, R_L=32Ω, P_{OUT}=125mW		0.5	1	%
		V_{CC}<3V, R_L=8Ω, P_{OUT}=20mW		0.5		%
		V_{CC}<12V, R_L=32Ω, P_{OUT}=200mW		0.6		%
Gain Bandwidth Product	GBW			1.5		MHz
Power Supply Rejection (V_{CC}=6V, ΔV_{CC}=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	$G_{V(MUTE)}$	Mute=2V, 1KHz<f<20KHz	70			dB

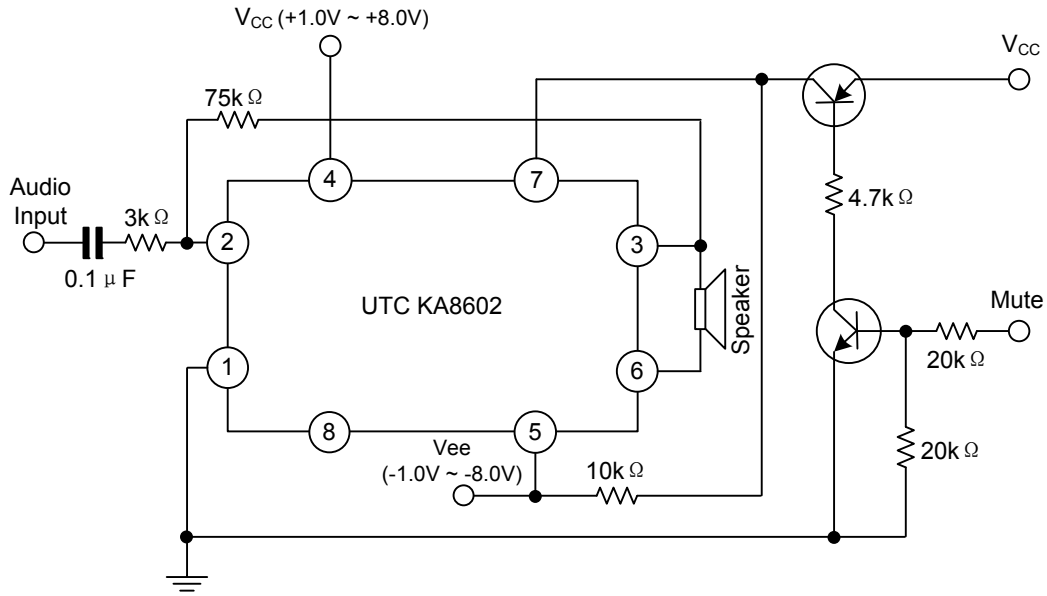
■ APPLICATION CIRCUIT











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