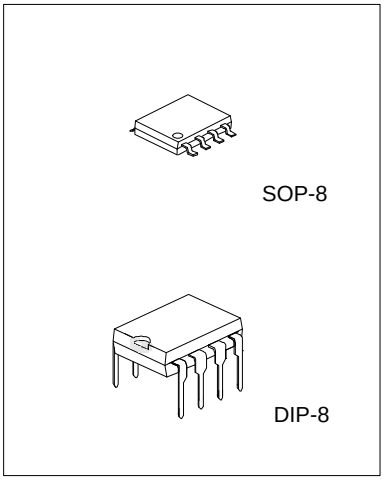
LOW VOLTAGE AUDIO POWER AMPLIFIER



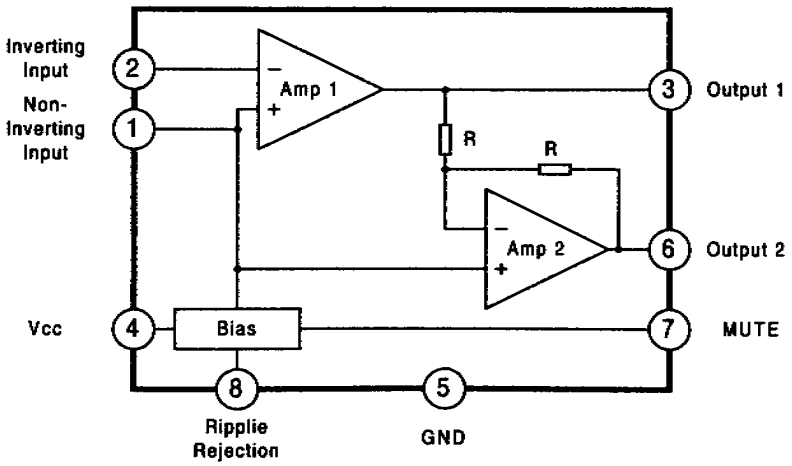
DESCRIPTION

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: Vcc=2V~16V
*Low quiescent supply current(Icc=2.7mA, typ)
*Medium output power(Po=250mW at Vcc=6V, R_L=32ohm, THD=10%
*Load impedance range: 8~100ohm
*Mute function (Icc=65μA, typ)
*Minimum number of external parts required.
*Low distortion

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS(Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	Vcc	-1~18	V
Output Current	Io	+-250	mA
Maximum Input, Ripple Rejection, Mute Pin Voltage	Vi(max)	-1~Vcc+1	V
Applied Output Voltage(Output Pin When Disabled)	Vo	-1~Vcc+1	V
Temperature Junction	Tj	-55 ~ 150	°C

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 (Vcc~0.7V)/2.
4	Vcc	DC supply voltage is applied to this pin(Vcc=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 (Vcc~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 Vcc), 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.

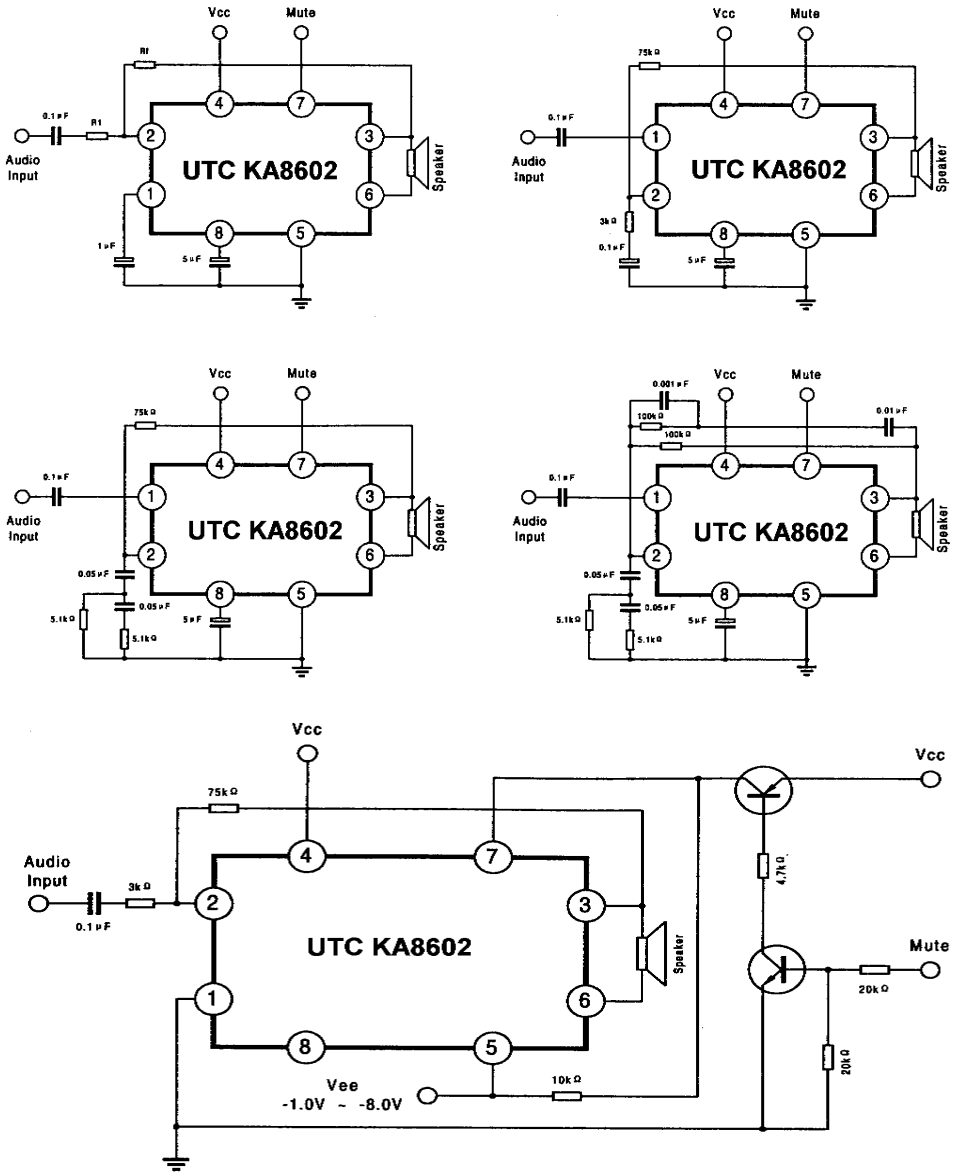
RECOMMENDED OPERATION CONDITIONS(Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	Vcc	2~16	V
Load Impedance	Z_L	8~100	Ω
Peak Load Current	$I_{L(peak)}$	+-200	mA
Differential Gain(5KHz Bandwidth)	ΔGv	0~46	dB
Voltage at Mute	Vi(mute)	0~Vcc	V
Ambient Temperature	Ta	-20~470	°C

ELECTRICAL CHARACTERISTICS(V_{CC}=6V, Ta=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
DC PARAMETER						
Operating Current	Icc	Vcc=3V, Mute=0.8V		2.7	4	mA
		Vcc=16V, Mute=0.8V		3.3	5	mA
		Vcc=3V, Mute=2V		65	100	μA
Output Voltage	Vo	R_L=16Ω, R1=75KΩ				
		Vcc=3V	1	1.15	1.25	V
		Vcc=6V		2.65		V
		Vcc=12V		5.65		V
Output Offset Voltage	Voo	Vcc=6V, Rf=75KΩ,R_L=32Ω	-30	0	30	mV
Output High Level	V_{OH}	2V<Vcc<16V, Iout=-75mA		Vcc~1		V
Output Low Level	V_{OL}	2V<Vcc<16V, Iout=75mA		0.16		V
Input Bias Current	Ibias			-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	Po	Vcc=3V, R_L=6Ω, THD<10%	55			mW
		Vcc=6V, R_L=32Ω, THD<10%	250			mW
		Vcc=12V, R_L=100Ω, THD<10%	400			mW
Total Harmonic Distortion (f=1KHz)	THD	Vcc=6V, R_L=32Ω, Po=125mW		0.5	1	%
		Vcc<3V, R_L=8Ω, Po=20mW		0.5		%
		Vcc<12V, R_L=32Ω, Po=200mW		0.6		%
Gain Bandwidth Product	GBW			1.5		MHz
Power Supply Rejection (Vcc=6V, ΔVcc=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	Gv(mute)	Mute=2V, 1KHz<f<20KHz	70			dB

APPLICATION CIRCUIT


Vcc
Mute
Audio Input
UTC KA8602
Speaker
Vcc
Mute
Audio Input
UTC KA8602
Speaker
Vcc
Mute
Audio Input
UTC KA8602
Speaker
Vcc
Mute
Audio Input
UTC KA8602
Speaker
Vcc
Audio Input
3kΩ
0.1μF
75kΩ
UTC KA8602
Speaker
Vcc
4.7kΩ
Mute
20kΩ
20kΩ
Vee
-1.0V ~ -8.0V
10kΩ