

Type	Ordering Code	Package	Color Code
S 1531 G	Q67000-A2063	similar to P-DSO-8 (SMD)	orange/green

### Functional Description

The AF amplifier was designed for small operating voltages. It is, therefore, specially suited for use in battery-operated equipment.

The open collector outputs can be used to drive center-tapped speakers.

### Circuit Description

An unsymmetrically driven differential amplifier with negative feedback to achieve 20 dB voltage gain, is followed by a second differential amplifier that determines the upper cut-off frequency by means of integrated low-pass filters.

Current-controlled booster amplifiers with high current gain are connected to the antiphase outputs of this differential amplifier.

A negative feedback branch to the input of the second differential amplifiers sets the total gain of the circuit to  $40 \text{ dB} \pm 3 \text{ dB}$ .

Additional circuitry prevents saturation of the prestage transistors, thereby achieving maximum output power at low harmonic distortion.

A regulating loop serves to make the quiescent current of the output transistors independent of temperature.

The amplifier can be switched on by a muting voltage; with no muting voltage, the amplifier is switched off, except for quiescent currents of some  $\mu\text{A}$ .

**Maximum Ratings**

Description	Symbol	min	typ	max	Unit
Supply voltage	$V_S$	-0.3		2.0	V
Peak output current	$I_Q$			250	mA
Muting input voltage	$V_M$			$V_S$	V
Junction temperature	$T_J$			125	°C
Storage temperature	$T_{stg}$	-40		125	°C
Ambient temperature	$T_A$	-20		60	°C
Thermal resistance system - air	$R_{th SA}$			200	K/W

**Operating Range**

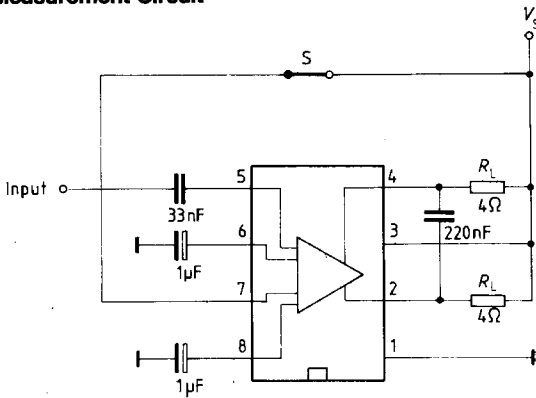
Supply voltage	$V_S$	1		1.7	V
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**Characteristics**

$V_S = 1.2 \text{ V}$ ;  $T_A = -10^\circ\text{C}$  to  $+40^\circ\text{C}$

Description	Symbol	Test conditions	Test circuit	min	typ	max	Unit
Quiescent current	$I_S$	$V_M = V_S$ $V_M = 0$	1		5	20	mA
			1			20	$\mu\text{A}$
Output power	$P_Q$	$f = 1 \text{ kHz}$ , $THD = 10\%$ $R_L = 4 \Omega$	1		120		mW
Voltage gain	$G_V$ $G_V$	$T_A = 25^\circ\text{C}$	1	37	40	43	dB
			1	35	40	45	dB
Cut-off frequency	$f_l$ $f_u$	-3 dB	1	200			Hz
			1	5			kHz
Input resistance	$R_i$		1	30	50		k $\Omega$
Saturation voltage	$V_{CE sat}$	$I_Q = 225 \text{ mA}$	1		300		mV
Muting control current enabled disabled	$I_M$ $I_M$			50		5	$\mu\text{A}$
							$\mu\text{A}$
Signal-to-noise ratio	S/N	$P_Q = 50 \text{ mW}$ $R_L = 4 \Omega$	1		50		dB
Current consumption	$I_S$	$P_Q = 80 \text{ mW}$ $R_L = 4 \Omega$	1		140		mA
Efficiency	$\eta$	$P_Q = 80 \text{ mW}$ $R_L = 4 \Omega$	1		48		%
Total harmonic distortion	THD	$f = 0.2$ to $5 \text{ kHz}$ $P_Q = 80 \text{ mW}$	1		5		%
Total harmonic distortion	THD	$f = 0.5$ to $2 \text{ kHz}$ $P_Q = 80 \text{ mW}$	2		1.5		%

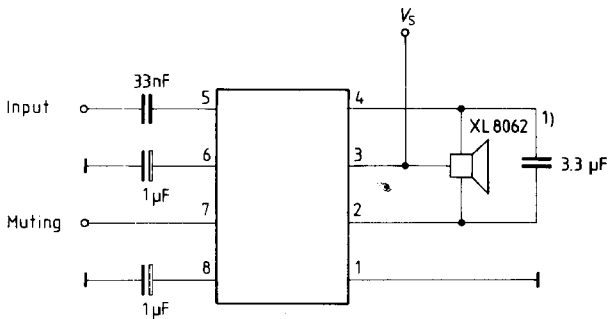
**Figure 1**  
**Measurement Circuit**



S closed : amplifier enabled

S open : amplifier disabled

**Figure 2**  
**Application Circuit**



1) Designation of Messrs. Knowtes, USA.