High Power Class B Output Stage

LC549/LV549/LD549 DATA SHEET

FEATURES

- **40dB of electrical gain**
- **1.0 to 1.6 VDC supply operating range**
- **current trim capability (R_T)**
- **high efficiency class B output stage**
- **may be used with a linear or compression preamplfier**

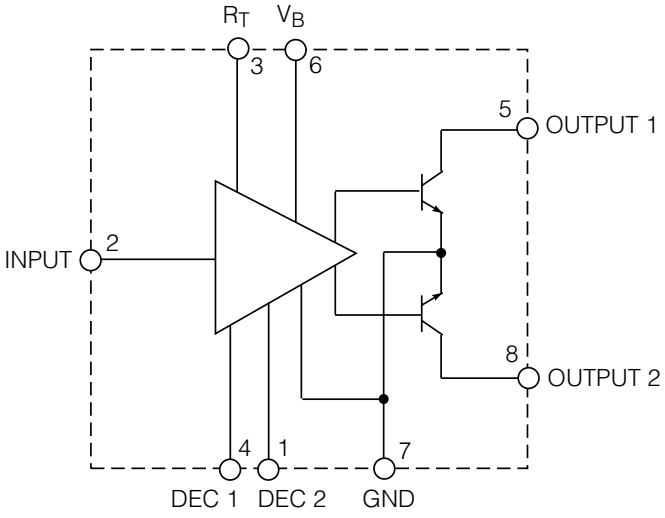
STANDARD PACKAGING

- 8 pin MICROpac (LC549)
- 8 pin MINIpac
- 8 pin PLID® (LC549, LD549)
- Chip (47 x 40 mils) (LC549, LD549)

DESCRIPTION

The LC/LV/LD549 is an 8 pin, low voltage, push-pull audio frequency output stage amplifier with a single unbalanced input. The circuit utilizes two internal negative feedback loops to stabilize the DC operating point for temperature stability and to linearize the transfer function over a wide dynamic range. The circuit operates near ideal class B conditions resulting in low distortion and very low quiescent current, required for extended battery life.

The LC549, LV549 and LD549 differ in only one respect; the LV549 and LD549 are selected devices which are capable of delivering from 10 mA to 41 mA and from 36 mA to 75 mA of output current respectively. These values are the maximum current drawn with both output stage transistors in saturation. Thus the LD549 is capable of producing a high output in a low impedance load, the LV549 is selected to have lower peak currents, extending the life of the battery.



U.S. Patent No. 4,085,382
Patented in other countries

BLOCK DIAGRAM

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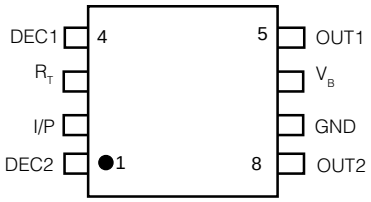
ABSOLUTE MAXIMUM RATINGS

PARAMETER	VALUE & UNITS
Supply Voltage	3 VDC
Power dissipation	60 mW
Operating Temperature	-10 to + 40 °C
Storage Temperature	-20 to + 70 °C

CAUTION
CLASS 1 ESD SENSITIVITY

PIN CONNECTION



ELECTRICAL CHARACTERISTICS

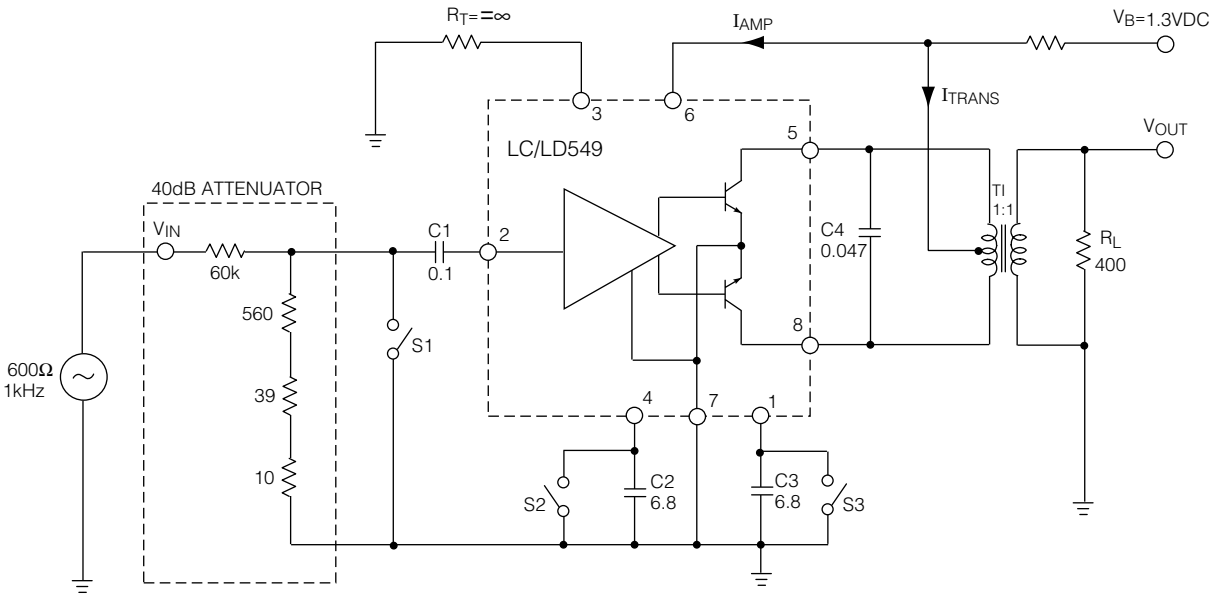
Conditions: Temperature 25 °C, Supply Voltage V_B = 1.3 VDC

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNITS
Gain	A_{CL}	V_{OUT} = 0.707 VRMS	38	40	42	dB
Quiescent Current	I_{AMP}		100	-	400	µA
	I_{TRANS}		170	-	370	µA
	I_{TOT}		-	500	770	µA
Maximum Drive Current		V1 = 0V (S2, S3 closed)				
		V4 = 0V LC549	10	35	75	mA
		LV549	10	-	41	mA
		LD549	36	50	75	mA
Input Impedance			18	27	36	kΩ
Total Harmonic Distortion & Noise	THD	V_{OUT} = 0.707 VRMS	-	0.5	-	%
		V_{OUT} = 1.3 VRMS	-	2.5	5.2	%
Input Referred Noise	IRN	NFB 0.2 to 10 kHz at 12 dB/oct (S1 closed)	-	1.2	2.5	µV
Start Up Time			-	-	3	sec

All switches and parameters remain as shown in test circuit unless stated in condition column

START-UP TIME TEST (Refer to Test Circuit)

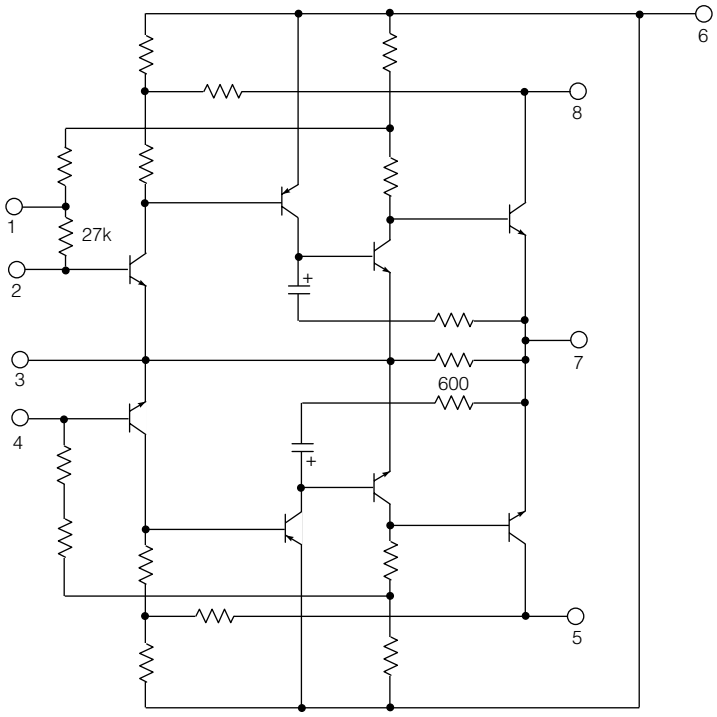
	SEQUENCE	CONDITIONS	COMMENTS
1	Power Supply	Off	
2	S1	Closed	Removes V_{IN}
3	S2 / S3	Closed	Discharges C2 and C3
4	S1	Open	Applies V_{IN} (V_{IN} level is determined from Gain Test)
5	S2 / S3	Open	Removes short from C2 and C3
6	Power Supply	On	
7	Gain must be within specification, within 3 seconds after power supply is turned on		



All resistors in ohms, all capacitors in μF unless otherwise stated

$$\text{Gain} = 20 \log_{10}\left(\frac{VOUT}{VIN}\right) + 40 \text{ dB}$$

Fig. 1 Test Circuit



All resistors in ohms, all capacitors in farads unless otherwise stated
U.S. Patent No. 4,085,382 - Patented in other countries

Fig. 2 Equivalent Circuit

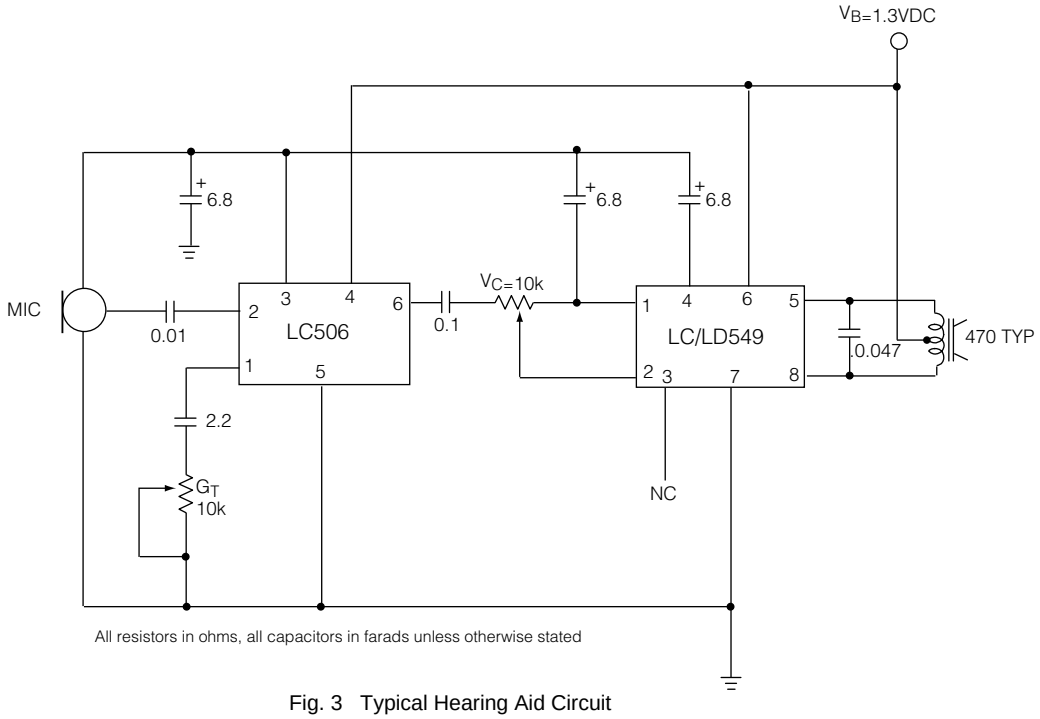


Fig. 3 Typical Hearing Aid Circuit

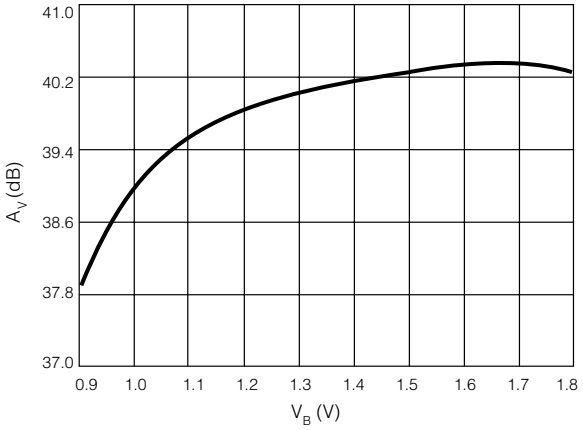


Fig. 4 Volume Gain vs Battery Voltage

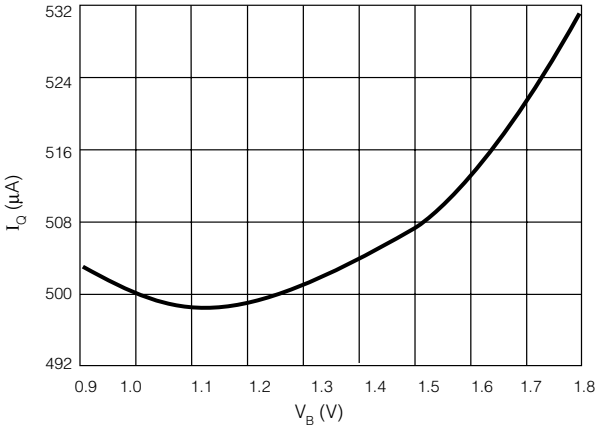


Fig. 5 Quiescent Current vs Battery Voltage

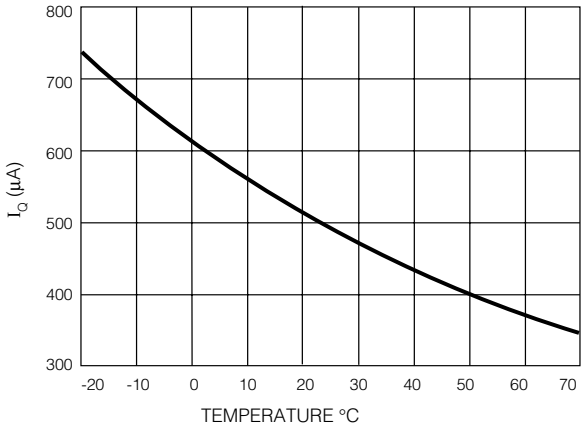


Fig. 6 Quiescent Current vs Temperature

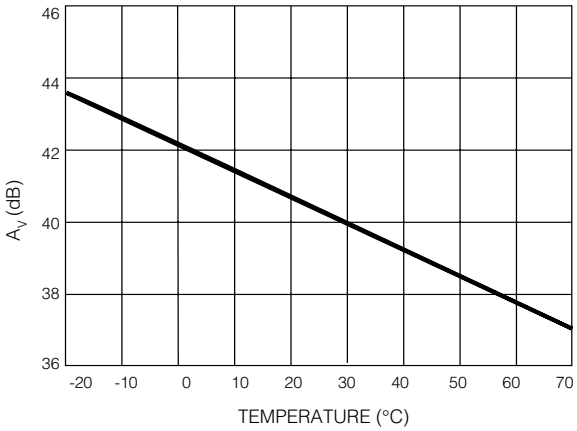


Fig. 7 Gain vs Temperature

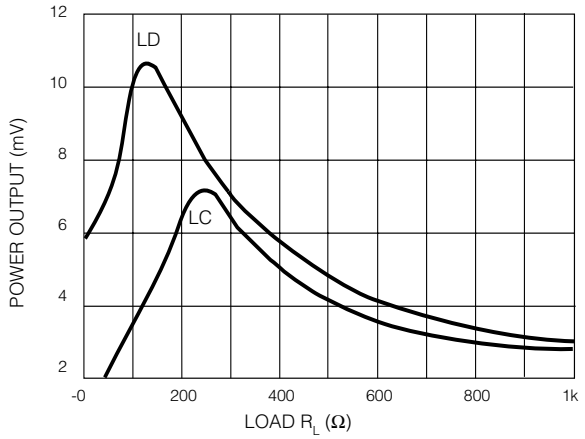


Fig. 8 Power Output vs Load Resistance at 7% Distortion R_B = 0Ω

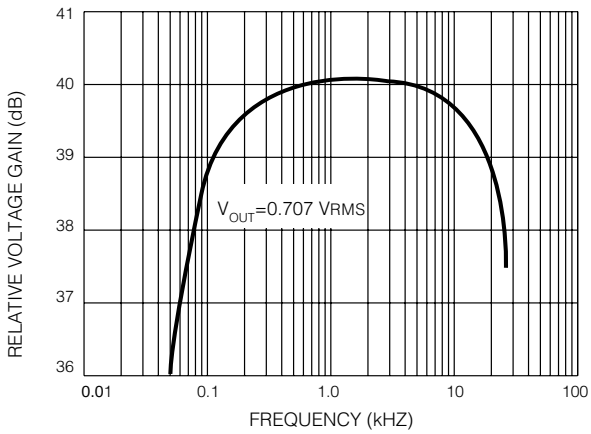


Fig. 9 Voltage Gain vs Frequency

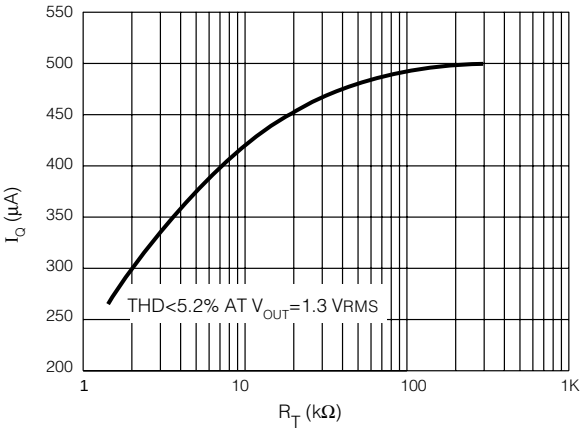


Fig. 10 Quiescent Current vs Current Trim Resistor

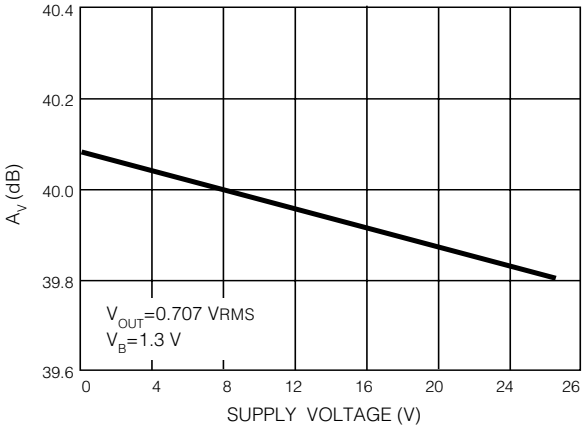


Fig. 11 Voltage Gain vs Battery Resistance

REVISION NOTES
Changes to standard packaging information

DOCUMENT IDENTIFICATION

PRODUCT PROPOSAL
This data has been compiled for market investigation purposes only, and does not constitute an offer for sale.

ADVANCE INFORMATION NOTE
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DATA SHEET
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