High Gain Class A Amplifier

LC505/LD505 DATA SHEET

NOT RECOMMENDED FOR NEW DESIGNS

FEATURES

- **71 dB of gain with 1.3 V supply**
- **0.2 to 2.0 mA of transducer current adjustment**
- **43 dB of volume control range**
- **1.0 to 1.6 V supply operating range**
- **2.2 kΩ internal decoupling resistor for microphone bias (LD505 only)**
- **output limiting capabilities (LD505 only)**

STANDARD PACKAGING

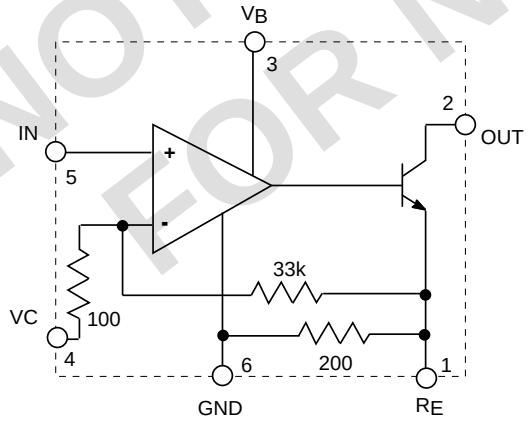
- MINIpac P6 (LC505)
- MINIpac P8 (LD505)

DESCRIPTION

The LC/LD505 are low voltage, linear monolithic integrated amplifiers with a typical electrical gain of 71 dB. The circuits are comprised of a compensated, unconditionally stable, operational amplifier and a low distortion Class A single transistor output stage with negative feedback for stability over a wide temperature range.

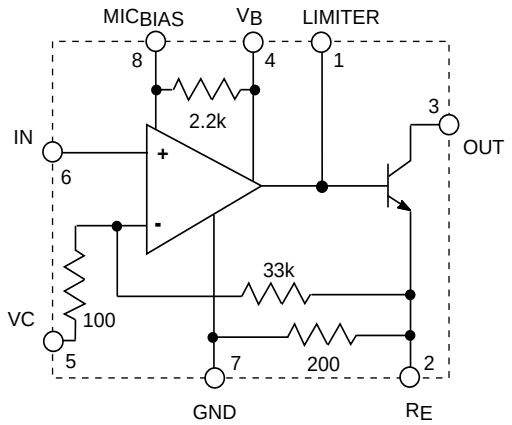
Current trimming in the output stage for inductive or resistive loads can be accomplished by connecting an emitter resistor from RE to ground. The LC/LD505 can operate over a supply voltage range of 1.0 to 1.6 DC.

The LD505 which is an eight pin device, has an internal 2.2 kΩ decoupling resistor for microphone bias providing increased supply line rejection. The base of the output transistor is also accessible allowing connection of diodes in a feedback configuration for peak limiting.



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

LC505 BLOCK DIAGRAM



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

LD505 BLOCK DIAGRAM

Revision Date: January 1996

Document No. 500 - 15 - 09

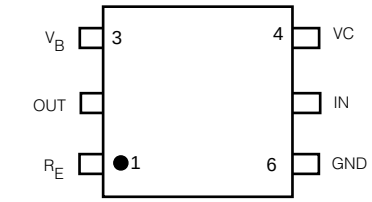
GENNUM CORPORATION P.O. Box 489, Stn A, Burlington, Ontario, Canada L7R 3Y3 tel. (905) 632-2996 fax: (905) 632-5946
Japan Branch: A-302, Miyamae Village, 2–10–42 Miyamae, Suginami–ku, Tokyo 168, Japan tel. (03) 3334-7700 fax (03) 3247-8839

ABSOLUTE MAXIMUM RATINGS

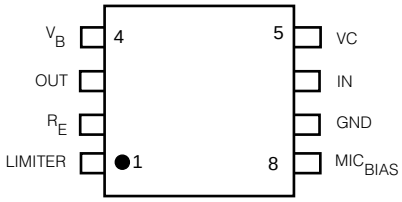
PARAMETER	VALUE & UNITS
Supply Voltage	3 V
Operating Temperature	-10 to +40 °C
Power dissipation	25 mW

CAUTION
CLASS 1 ESD SENSITIVITY

PIN CONNECTION



LC505

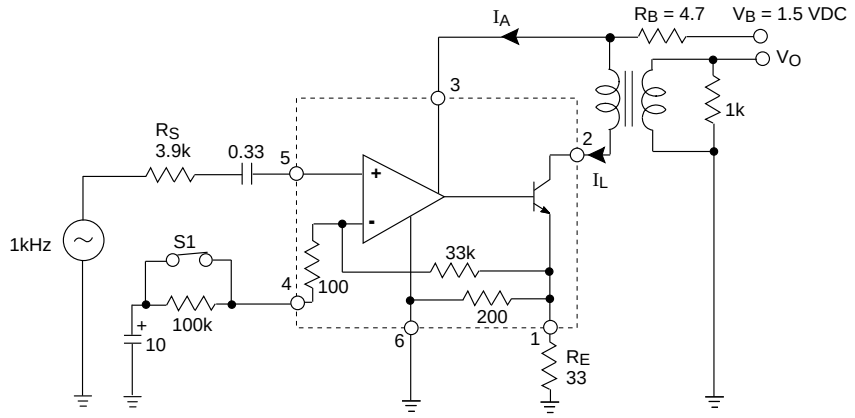


LD505

ELECTRICAL CHARACTERISTICS

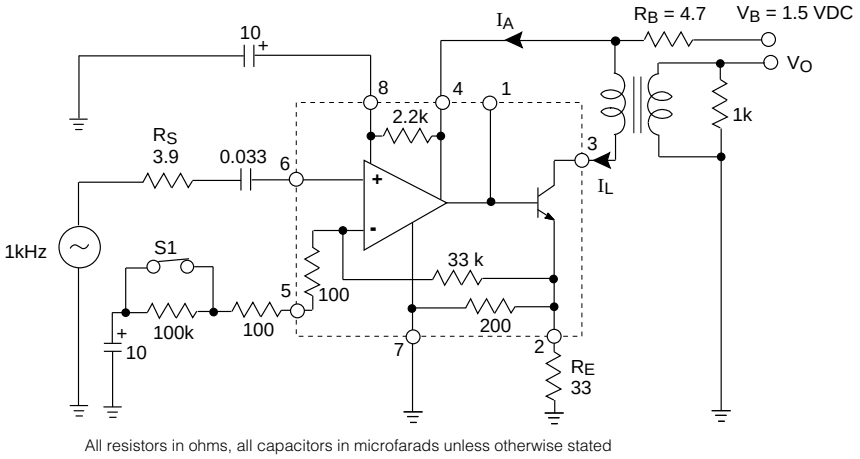
All switches remain as shown in test circuit unless stated in condition column
Conditions: Temperature 25 °C, V_{cc} = 1.55 V

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Gain	A_V		68	72	76	dB
		V_{cc} = 1.3 V	66	71	76	dB
Temperature Coefficient of Gain	η_A		-	0.07	-	dB/°C
Amplifier Current	I_A		-	0.21	0.28	mA
		V_{cc} = 1.3 V	-	0.16	0.23	mA
Temperature Coefficient of Current	η_I		-	-0.002	-	mA/°C
Transducer Current	I_L		1.3	1.5	1.9	mA
		V_{cc} = 1.3 V	1.0	1.3	1.7	mA
Total Harmonic Distortion			-	2	5	%
		V_{cc} = 1.3 V	-	-	6	%
Input Referred Noise		Bandwidth at 12 dB/OCT - 0.2 to 10 kHz	-	1.2	2.0	μVRMS
Battery Resistance Stability		R_{VC} = 100k (S1-open)	22	-	-	Ω
Input Impedance		LC505	-	8	-	kΩ
		LD505	-	27	-	kΩ
Frequency Response (-3 dB)		Low	-	100	-	Hz
		High	-	5000	-	Hz
Volume Control Range		R_{VC} = 0 to 100kΩ (S1 - closed/open)	36	43	-	dB
		R_{VC} = 0 to 100kΩ (S1 - closed/open) V_{cc} = 1.3 V	34	42	-	dB
Gain Dependance of RB		LC505	-	-0.4	-	dB/Ω
		LD505	-	+0.16	-	dB/Ω



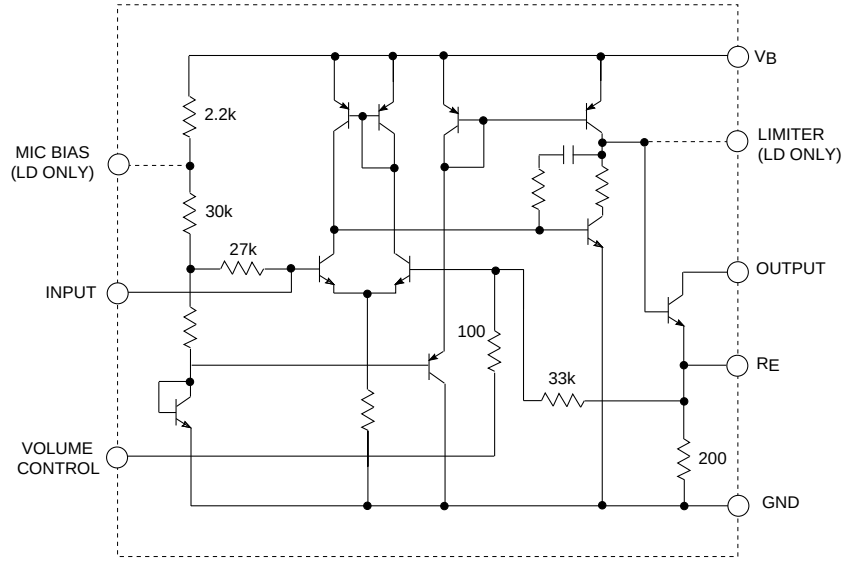
All resistors in ohms, all capacitors in microfarads unless otherwise stated

Fig. 1 LC505 Test Circuit



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

Fig. 2 LD505 Test Circuit



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

Fig. 3 Equivalent Circuit

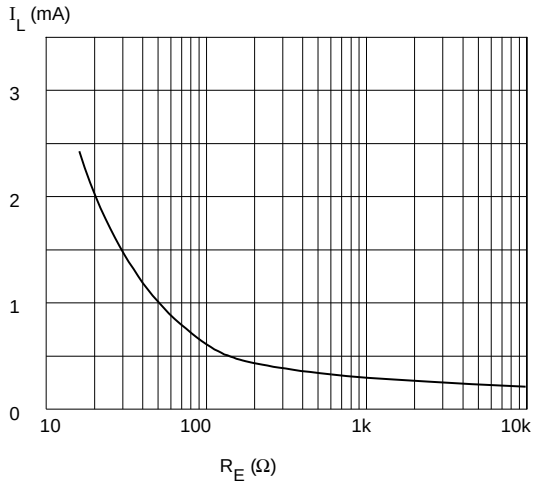


Fig. 4 Load Current vs Emitter Resistor

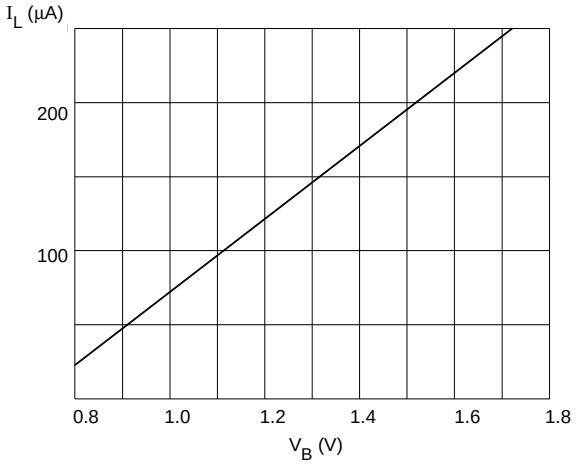


Fig. 5 Amplifier Current vs Supply Voltage

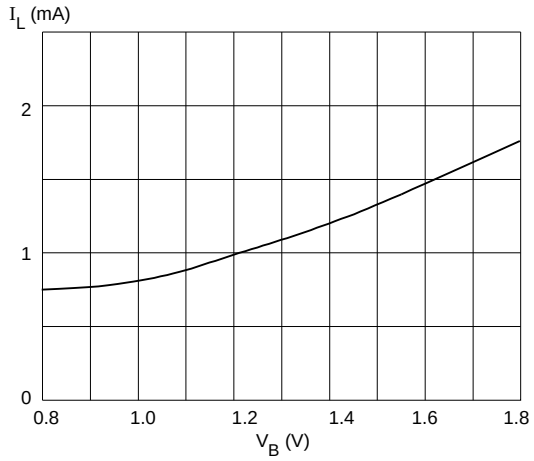


Fig. 6 Load Current vs Supply Voltage

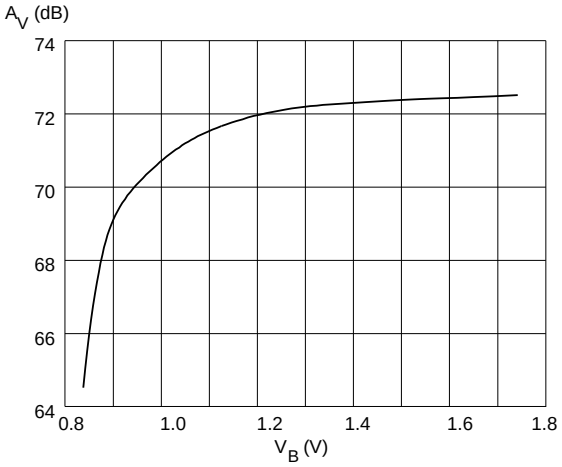


Fig. 7 Absolute Voltage Gain vs Supply Voltage

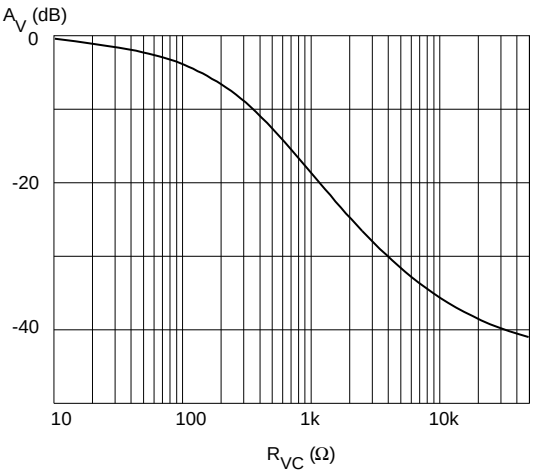


Fig. 8 Relative Voltage Gain vs Volume Control Resistance

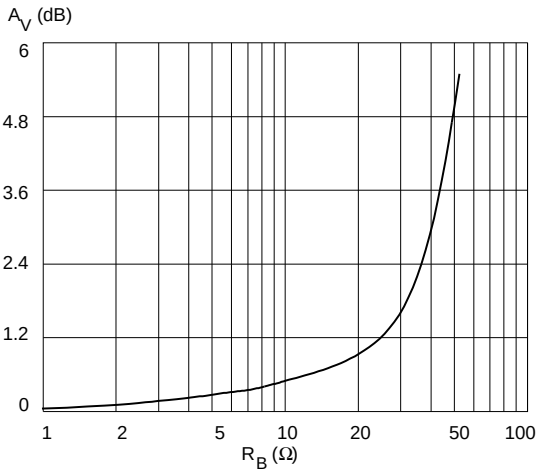


Fig. 9 Relative Voltage Gain vs Battery Resistance

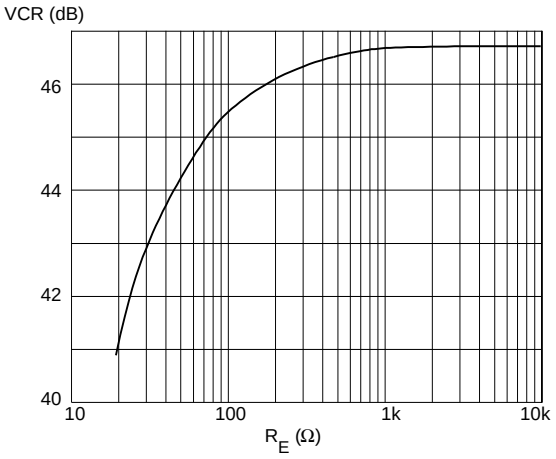


Fig. 10 Volume Control Range vs Emitter Resistor

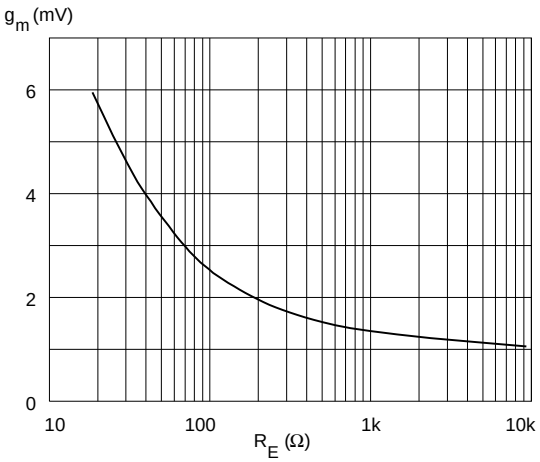
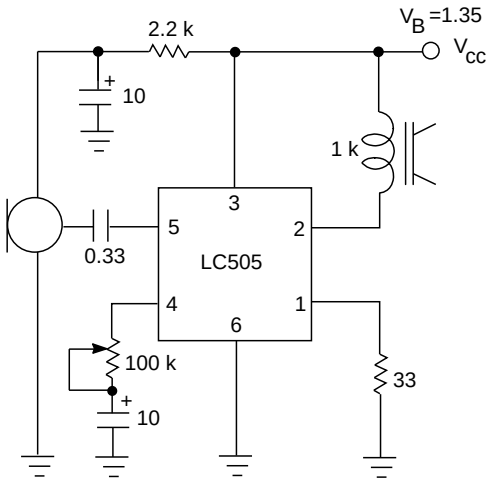
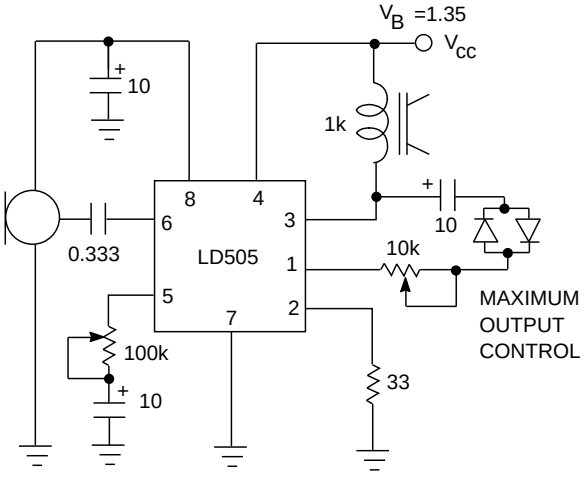


Fig. 11 Transductance vs Emitter Resistor



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

Fig. 12 LC505 Typical Hearing Aid Application



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

Fig. 13 LD505 Typical Hearing Aid Application

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
The product is in production. Gennum reserves the right to make changes at any time to improve reliability, function or design, in order to provide the best product possible.

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Chip information removed.

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