

**FEATURES**

- **44 dB typical preamplifier gain**
- **14 dB typical output stage gain**
- **compression function ratio 1:1 to 2:1 to ∞:1**
- **automatic setting of transducer current**
- **operation down to 1.1 VDC**
- **greater than 40 dB volume control range**

**STANDARD PACKAGING**

- 8 pin PLID
- 8 pin SLT (LD512)
- Chip (61 x 61 mils)  
Au Bump

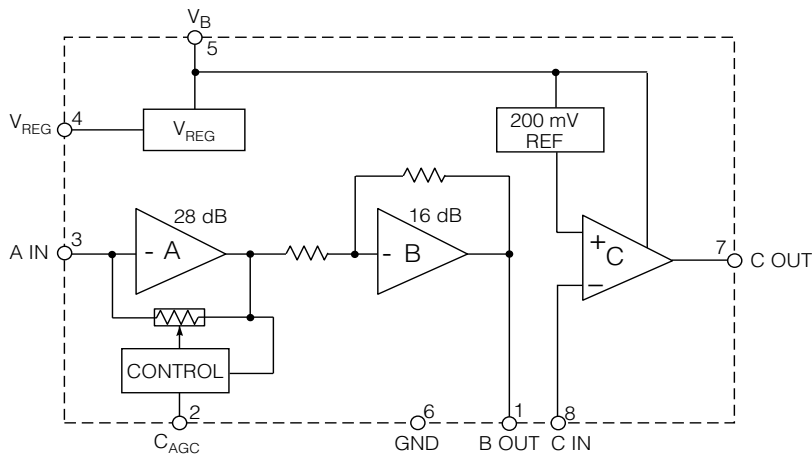
**DESCRIPTION**

The GB512 and LD512 are 8 pin stand-alone input compression amplifiers requiring minimal external parts. Each consists of a voltage regulator for the electret microphone providing a high power supply rejection ratio (PSRR), a compression stage which has a 2:1 compression ratio, and an auto-biasing, class A, voltage drive output stage.

The auto-bias output stage can drive a variety of impedances ranging from 500 Ω to 5 kΩ without adding any external resistors to set the bias.

The GB512 and LD512 are recommended for low to medium gain/output ITE and ITC type hearing aids.

The GB512 is tested to tighter test limits.



**BLOCK DIAGRAM**

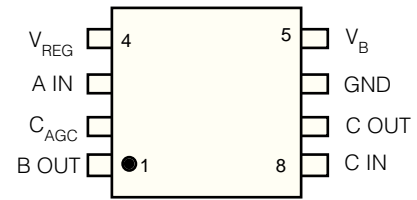
## ABSOLUTE MAXIMUM RATINGS

PARAMETER	VALUE/UNITS
Supply Voltage	5 V DC
Power Dissipation	25mW
Operating Temperature Range	-10°C to 40°C
Storage Temperature Range	-20°C to 70°C

**CAUTION**  
CLASS 1 ESD SENSITIVITY



## PIN CONNECTION



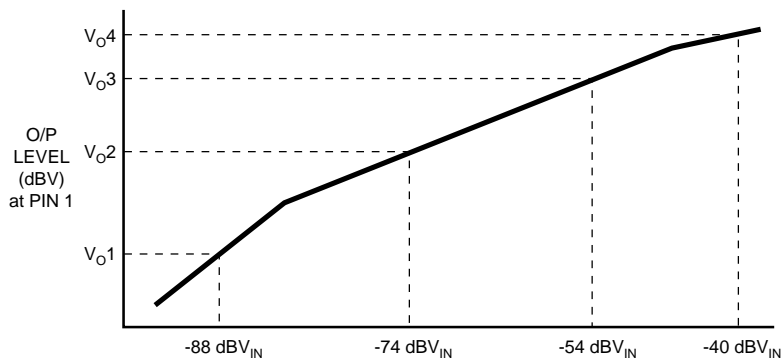
## ELECTRICAL CHARACTERISTICS

Conditions : Temperature 25°C, Frequency 1 kHz, Supply Voltage 1.3 VDC.

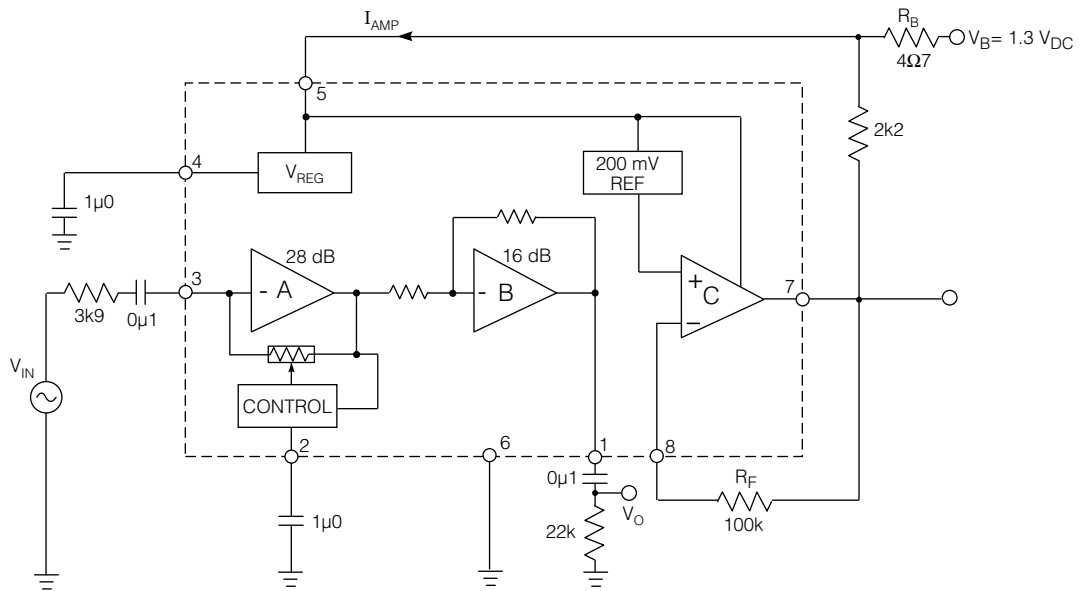
PARAMETER	SYMBOL	CONDITIONS	GB512			LD512			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	
Amplifier Current	$I_{AMP}$		110	200	290	110	200	290	$\mu A$
Regulator Voltage	$V_{REG}$		0.88	0.93	0.98	0.88	0.93	0.98	$V_{DC}$
Output Level	$V_{O1}$	$V_{IN} = -88 \text{ dBV}$	-47	-44	-41	-48	-44	-40	dBV
Output Level	$V_{O2}$	$V_{IN} = -74 \text{ dBV}$	$V_{O1} + 7$	$V_{O1} + 9$	$V_{O1} + 11$	-	-	-	dB
Output Level	$V_{O3}$	$V_{IN} = -54 \text{ dBV}$	$V_{O2} + 8$	$V_{O2} + 10$	$V_{O2} + 12$	$V_{O2} + 7$	$V_{O2} + 10$	$V_{O2} + 13$	dB
Output Level	$V_{O4}$	$V_{IN} = -40 \text{ dBV}$	-23	-20	-18	-23.5	-20	-17.5	dBV
Input Referred Noise	IRN	NFB 0.2-10kHz at 12dB/oct	-	1	3	-	1	3	$\mu V_{RMS}$
Total Harmonic Distortion	THD	$V_{IN} = -54 \text{ dBV}$	-	2	4	-	2	4	%
Receiver Bias Voltage	$V_{BIAS}$	Note 3	100	200	300	160	200	240	mVDC
Current Sinking Capability	$I_{SINK}$	Note 4	3	8	-	3	8	-	mA
Release Time Factor	$T_{REL}$		-	100	-	-	100	-	ms/ $\mu F$
Attack Time Factor	$T_{ATT}$		-	5	-	-	5	-	ms/ $\mu F$

All parameters and switches remain as shown in the Test Circuit unless stated in CONDITIONS column.

$V_{PX}$  - actual voltage measured on the pin at given condition (X is pin number).



- Notes:**
- $V_{O}$  and Distortion measurements are taken at pin 1.
  - Output stage gain =  $20 \log (R_F / R_S)$ .  
A gain of 14 dB is recommended for optimal stability. Stability is dependent upon the ratio of the receiver impedance ( $Z_L$ ) and the battery impedance to  $R_F$  &  $R_S$ .  
 $(R_F / R_S) < (Z_L / R_S)$
  - $V_{BIAS} = V_{P5} - V_{P7}$
  - Measured at pin 7



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

Fig. 1 Test Circuit

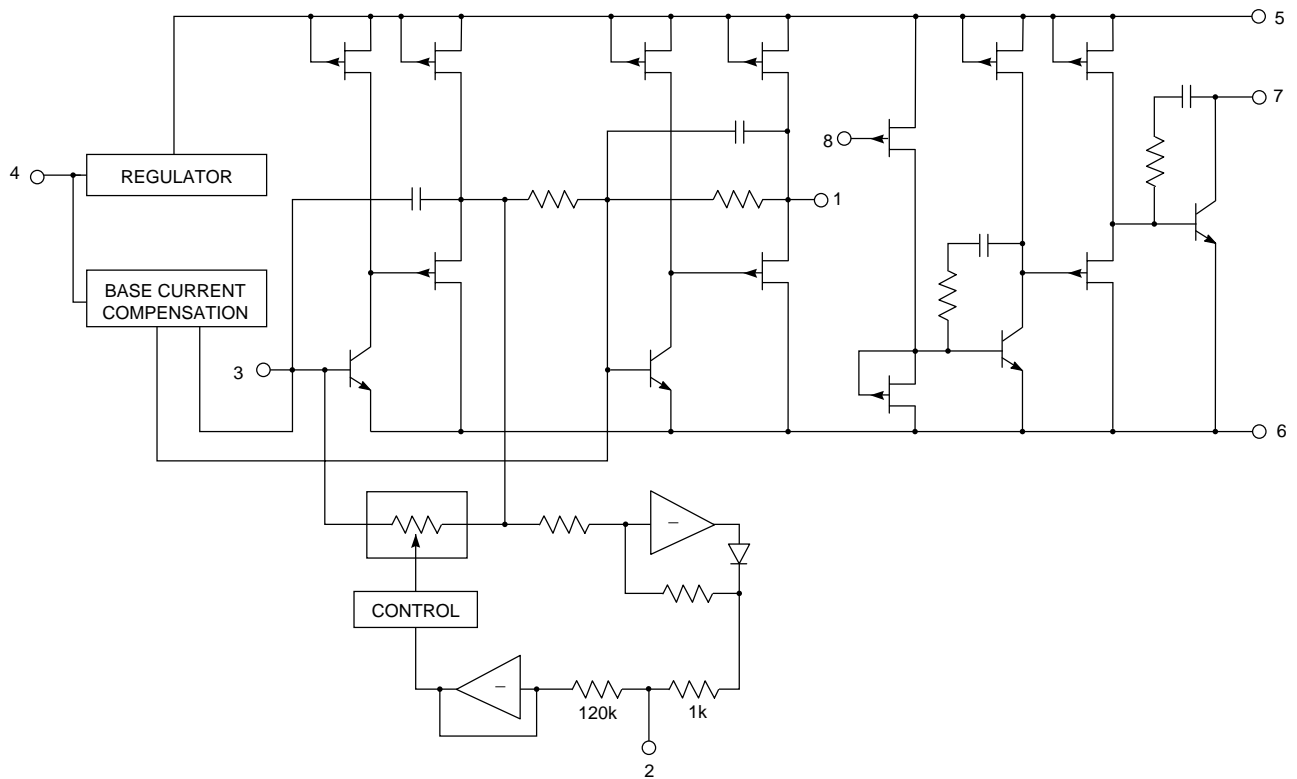


Fig. 2 Functional Schematic

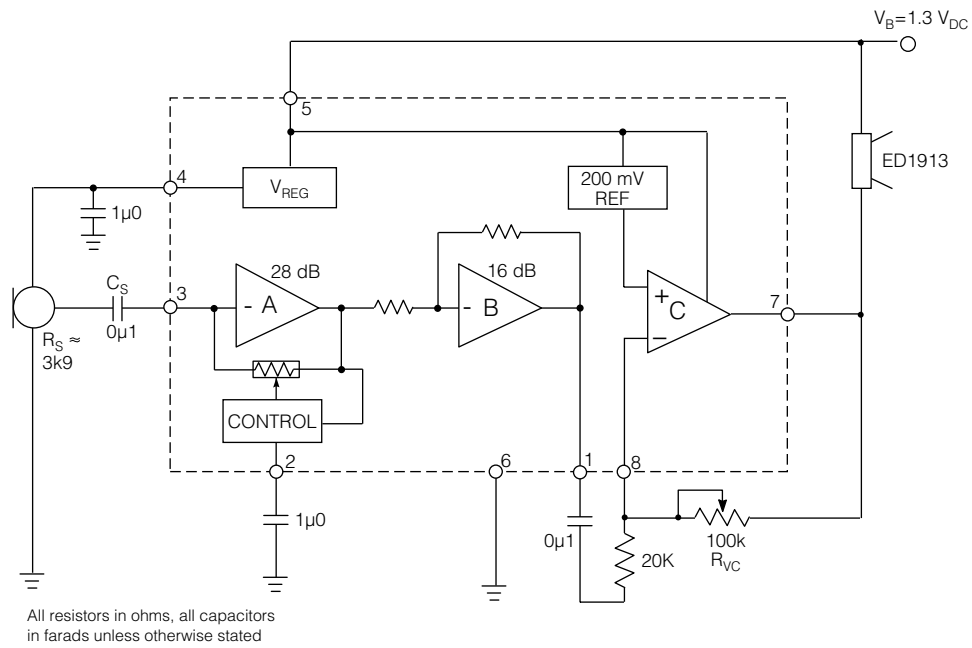


Fig. 3 Typical Hearing Aid Application

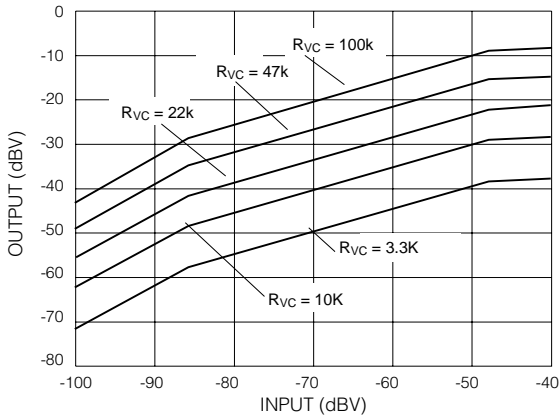


Fig. 4 I/O Characteristics at Various  $R_{VC}$  Values (Pin 7)

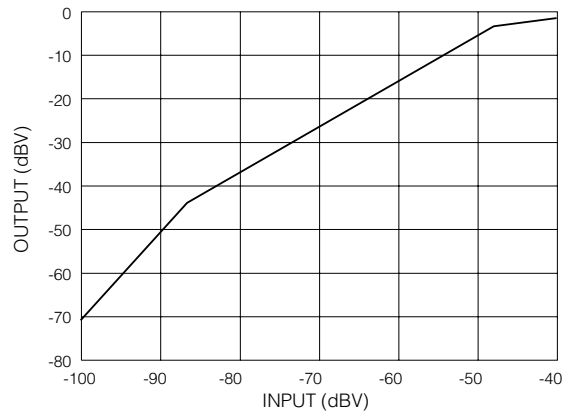


Fig. 5 I/O Characteristics at Pin 1

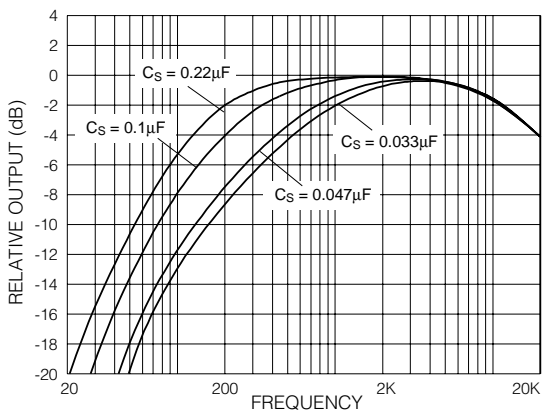


Fig. 6 Closed Loop Frequency Response at Various  $C_S$  Values

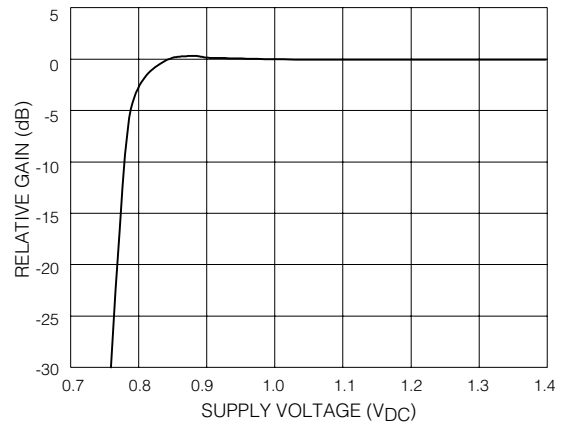


Fig. 7 Gain vs Supply Voltage

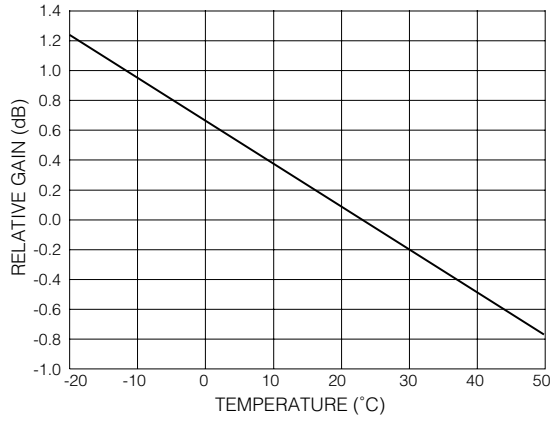


Fig. 8 Gain vs Temperature

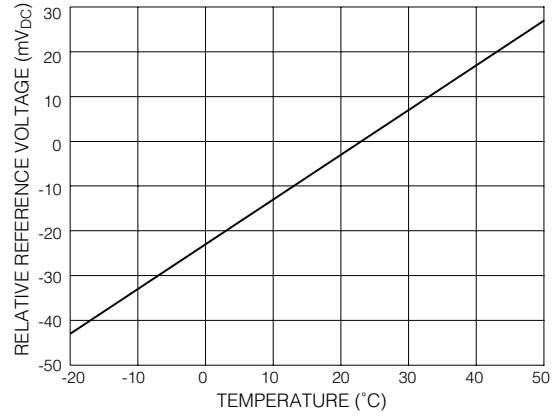


Fig. 9 Receiver Bias Voltage vs Temperature

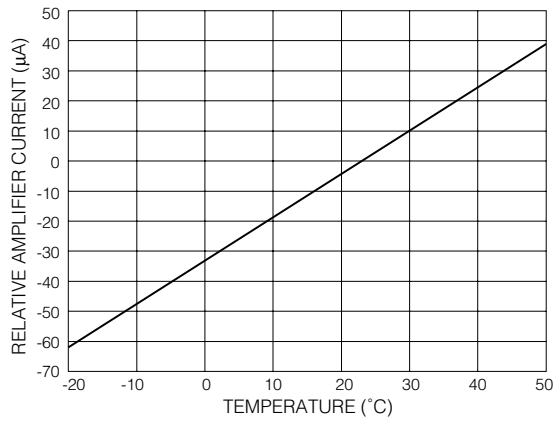


Fig. 10 Amplifier Current vs Temperature

**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**

This product is in development phase and specifications are subject to change without notice. Gennum reserves the right to remove the product at any time. Listing the product does not constitute an offer for sale.

**PRELIMINARY DATA SHEET**

The product is in a preproduction phase and specifications are subject to change without notice.

**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.