Telecoil Preamplifier

GC562 - DATA SHEET

FEATURES

- **direct coupled telecoil preamplifier**
- **natural low frequency rolloff to reduce 50/60 Hz hum pickup**
- **low current consumption (typ 65 μA)**
- **34 dB maximum gain**

STANDARD PACKAGING

- Chip (28 x 56 mils)
  Au Bump

DESCRIPTION

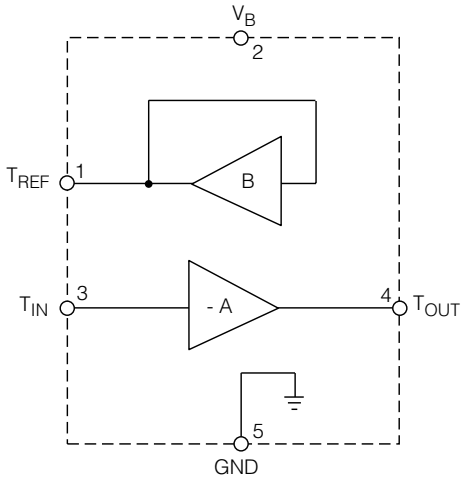
The GC562 was designed to allow direct coupling of the telecoil onto the preamplifier without the need of a capacitor.

The DC bias voltage at the output of the unity gain, inverting preamplifier B, precisely matches that of the input of preamp A. When the telecoil is placed between these two pins, no DC current will flow through the coil as the potential at both ends is equal. With stage B configured as unity gain, its output appears as a virtual ground to AC signals. The lower -3 dB corner frequency of the amplifier is set by the ratio of the telecoil resistance to the inductance, given by the equation:

$$f_L = \frac{R_{COIL}}{(2\pi L_{COIL})}$$

With a gain set resistor from the input to output of preamplifier A, a signal inductively coupled into the telecoil via the telephone will produce a signal current to flow through the resistor, thereby producing a voltage at the output of the amplifier.

For stability reasons it is recommended that the telecoil amplifier not be configured for more than 34 dB gain, or with a feedback resistor larger than 100 kΩ.



FUNCTIONAL BLOCK DIAGRAM

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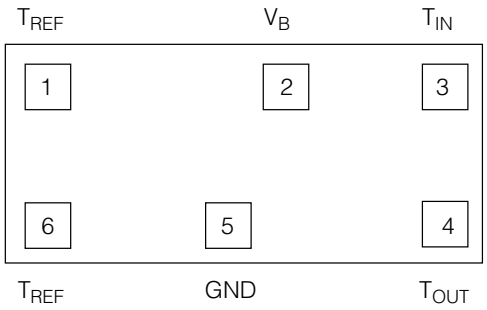
ABSOLUTE MAXIMUM RATINGS

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

CAUTION
CLASS 1 ESD SENSITIVITY

CHIP PIN CONNECTION



ELECTRICAL CHARACTERISTICS

Conditions: Frequency = 1 kHz, Temperature = 25°C, Supply Voltage V_B = 1.3 V

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
DC SPECIFICATIONS						
Amplifier Current	I_{AMP}		40	65	100	µA
Telecoil Offset Voltage	T_{VOFF}	$V_{P1} - V_{P3}$	-4	0	4	mV
Input Bias Current	I_{BIAS}		10	100	200	nA
Stage A Source Current	I_{SRC_A}		15	30	-	µA
Stage B Source Current	I_{SRC_B}		7	15	-	µA
Output Voltage Swing-Low (Stage A)	V_{OL}		50	300	-	mV
AC SPECIFICATIONS						
T_{REF} Output Impedance	Z_{OUT}	at < 5kHz	-	200	-	Ω
Input Referred Noise	IRN	NFB 0.2 to 10kHz at 12dB/oct	-	1.5	-	µVRMS

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

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

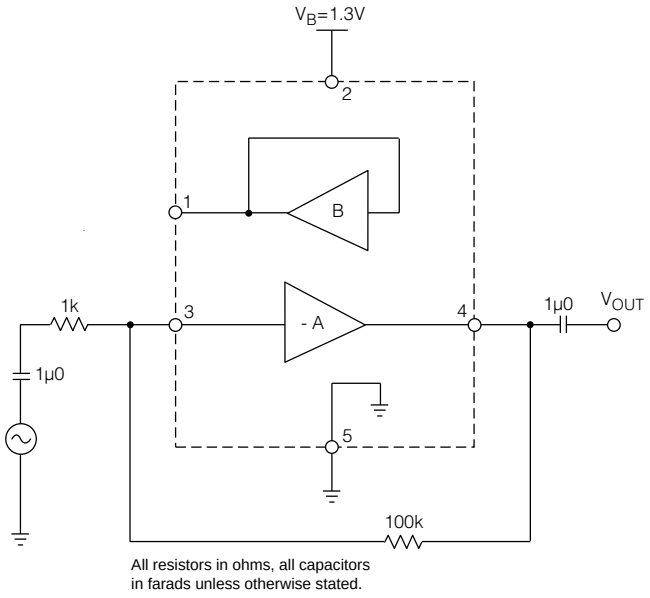


Fig. 1 Test Circuit

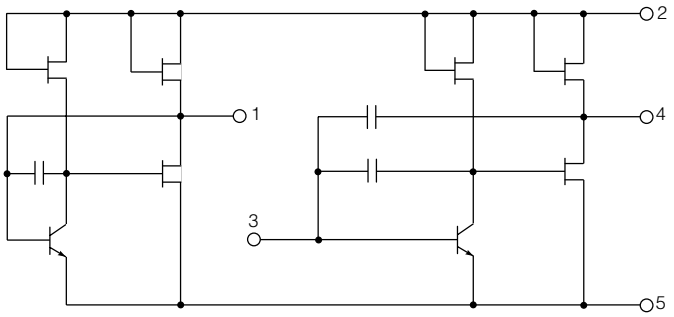


Fig. 2 Functional Schematic Diagram

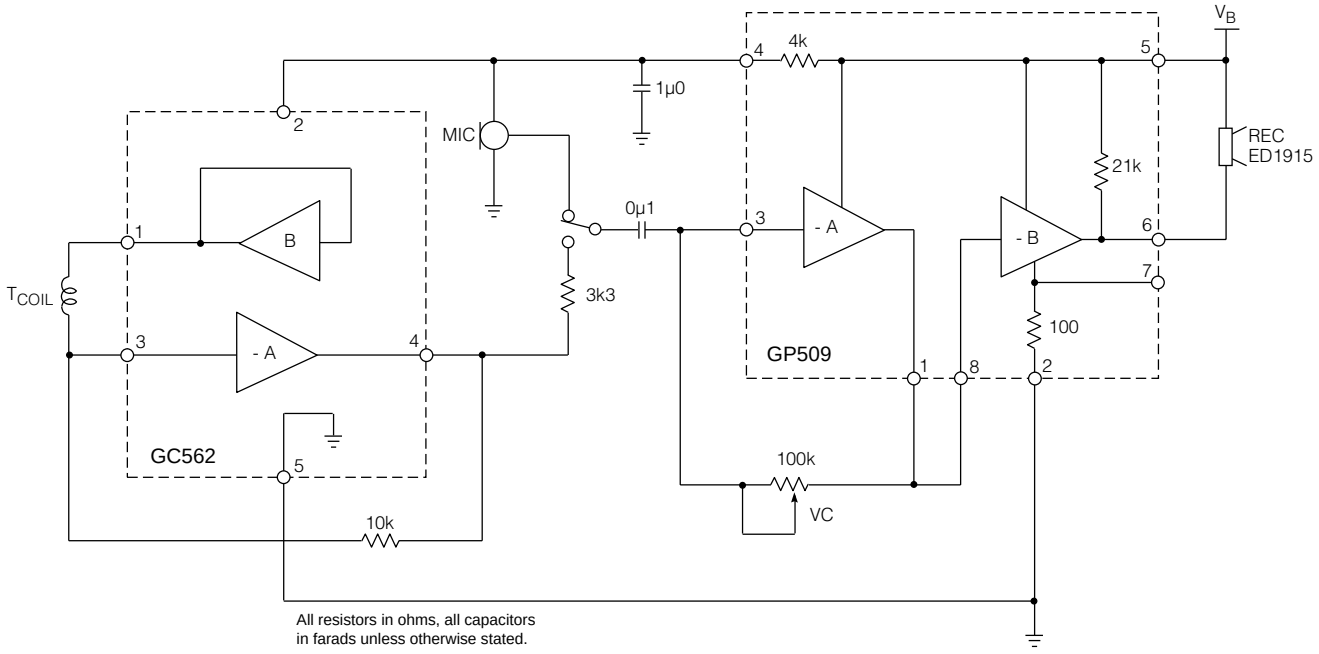


Fig. 3 Typical Hearing Instrument Application

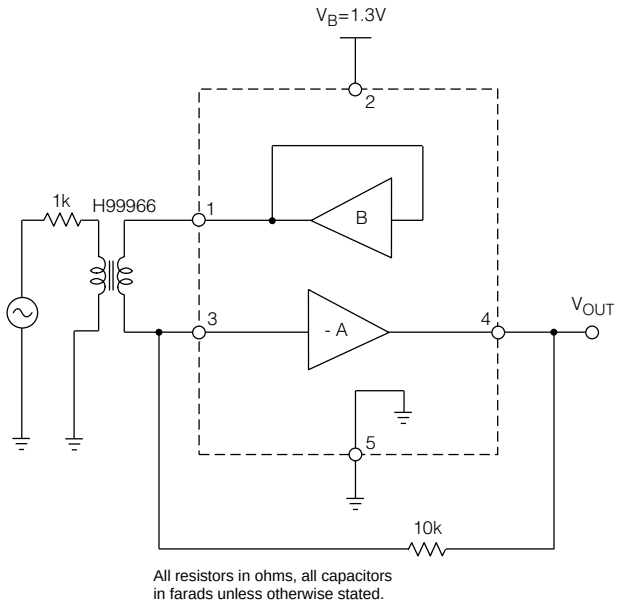


Fig. 4 Characterization Circuit

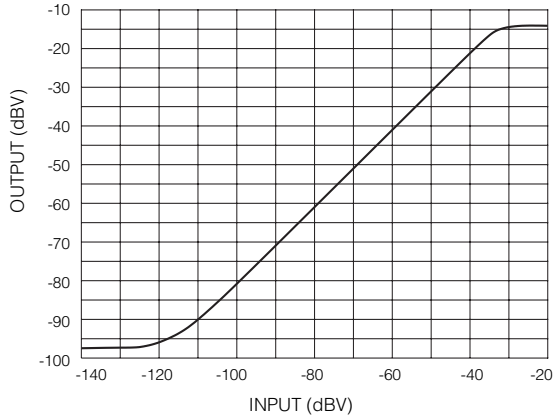


Fig. 5 I/O Curve

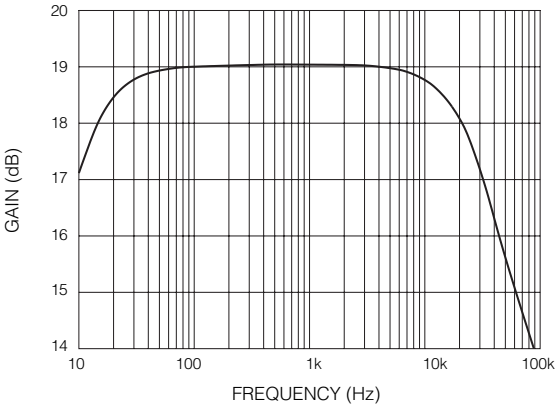


Fig. 6 Frequency Response

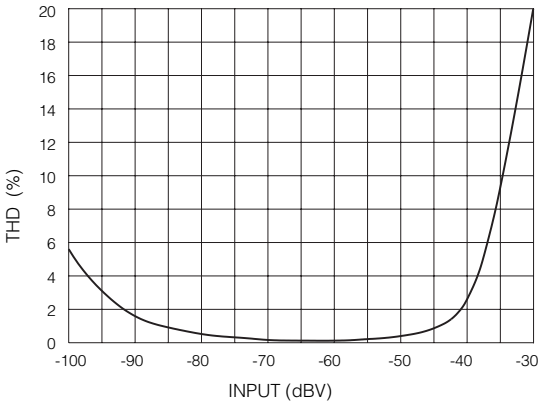


Fig. 7 THD vs Input

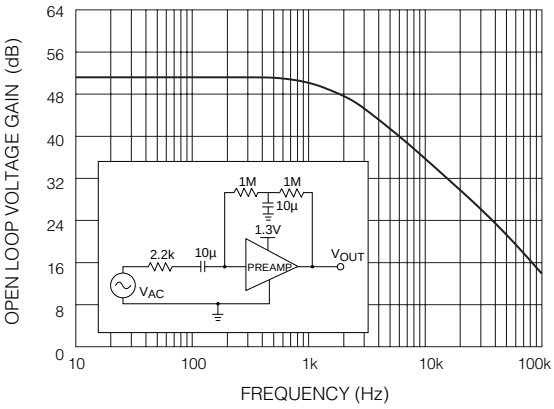
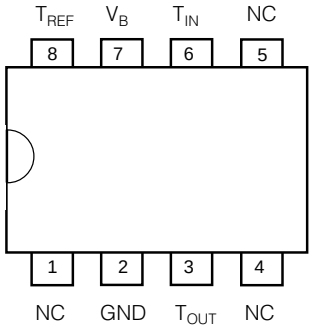


Fig. 8 Stage A Open Loop Voltage Gain

8 PIN DIP PINOUT

(For Evaluation Purposes)



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DOCUMENT IDENTIFICATION: 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.

REVISION NOTES:

Added Au Bump.