



GENNUM
CORPORATION

Preamp Hybrid for Class D

GS3001 - HYB DATA SHEET

FEATURES

- designed to drive class D integrated receivers
- adjustable peak clipper
- low current drain (150 μ A typical)
- 46 dB of adjustable gain
- low external parts required (R_{VC} , R_{MPO})
- low noise and distortion
- mid supply referenced output

STANDARD PACKAGING

- Hybrid typical dimensions
0.140 in. x 0.240 in. x 0.110 in.
(3.56 mm x 6.10 mm x 2.79 mm)

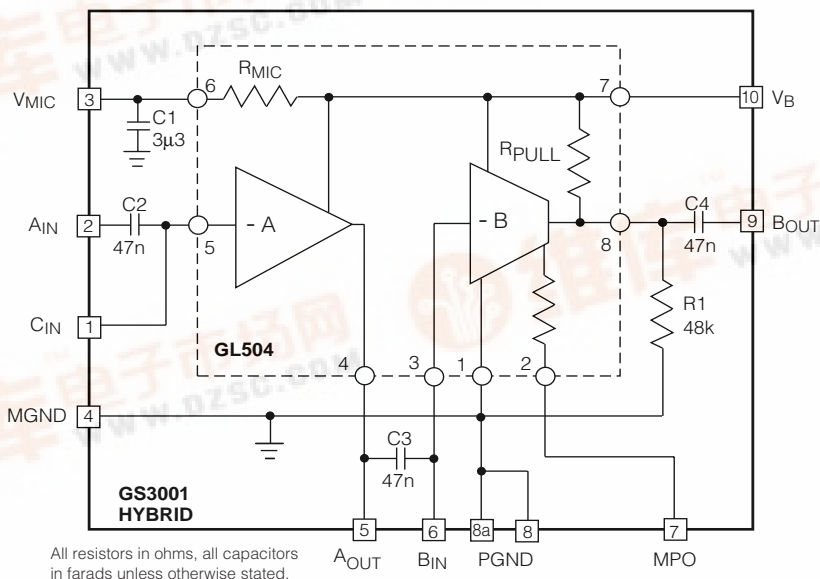
DESCRIPTION

The GS3001 incorporates Gennum's GL504 preamp, all the required coupling and decoupling capacitors, and a mid-supply referencing 48 k Ω resistor. All that is required further for a fully functioning hearing aid system is the addition of a microphone, receiver, volume control and an MPO adjusting potentiometer.

The GS3001 can be mounted on the back of the hearing aid's battery compartment. It has several access pads allowing for adjustment of the frequency characteristics. An additional ground pad (8a) is also included to aid in the manufacturability of the system.

The GL504 chip is Gennum's proprietary low current preamplifier designed to drive class D integrated receivers. This preamp has a built-in symmetrical peak clipping output limiter and up to 46 dB of adjustable gain.

The major advantage of the GL504 over other preamplifiers is the electronic MPO adjustment. Since conventional MPO is not possible for integrated receivers, it is provided in the preamp. The maximum output swing is easily set using an R_{MPO} resistor. The receiver output level is thus limited, preventing it from exceeding the discomfort level.



BLOCK DIAGRAM



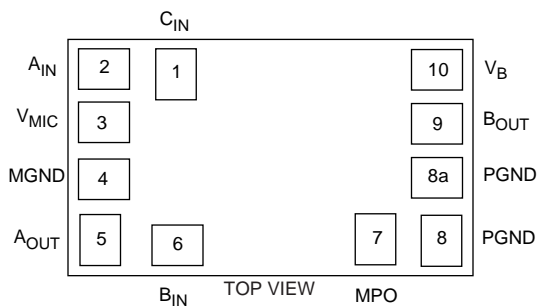
ABSOLUTE MAXIMUM RATINGS

PARAMETER	VALUE & UNITS
Supply Voltage	3 V DC
Power Dissipation	25 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, Frequency = 1 kHz.

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNITS
System Gain	A_V	$V_{IN} = -80$ dBV, Frequency = 5 kHz	44.5	46.5	48.5	dB
Amplifier Current	I_{AMP}	$V_{IN} = 0$, $R_{MPO} = 0 \Omega$	75	150	225	μA
Maximum Output	MPO	$V_{IN} = -50$ dBV, $R_{MPO} = 0 \Omega$	-16	-14	-12	dBV
MPO Range	ΔMPO	$V_{IN} = -50$ dBV, $R_{MPO} = 10 k\Omega$	10	12	14	dB
Input Referred Noise	IRN	NFB at 200 Hz to 10 kHz	-	2	-	$\mu VRMS$
Distortion	THD		-	<1.0	-	%
On Chip Pull-up Resistance	R_{PULL}		-	48	-	$k\Omega$
On Chip Microphone Resistor	R_{MIC}		-	4	-	$k\Omega$
Mic Decoupling Capacitor	C1		-20%	3.3	+20%	μF
Input Coupling Capacitor	C2		-10%	0.047	+10%	μF
Interstage Coupling Capacitor	C3		-10%	0.047	+10%	μF
Output Coupling Capacitor	C4		-10%	0.047	+10%	μF
Output Resistor	R1		-5%	48	+5%	$k\Omega$
Output Impedance (Pad 9)	R_{OUT}		-	24	-	$k\Omega$

(All conditions and parameters remain as shown in test circuit unless stated in condition column)

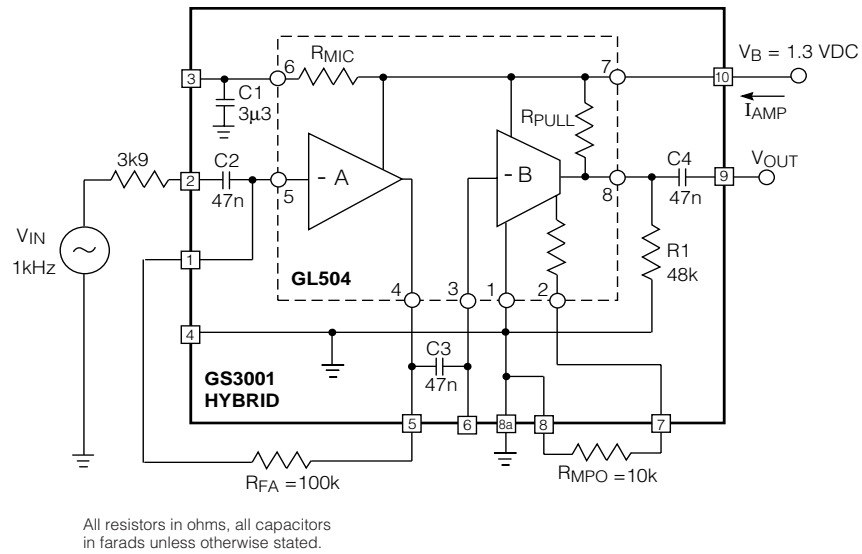


Fig. 1 Production Test Circuit

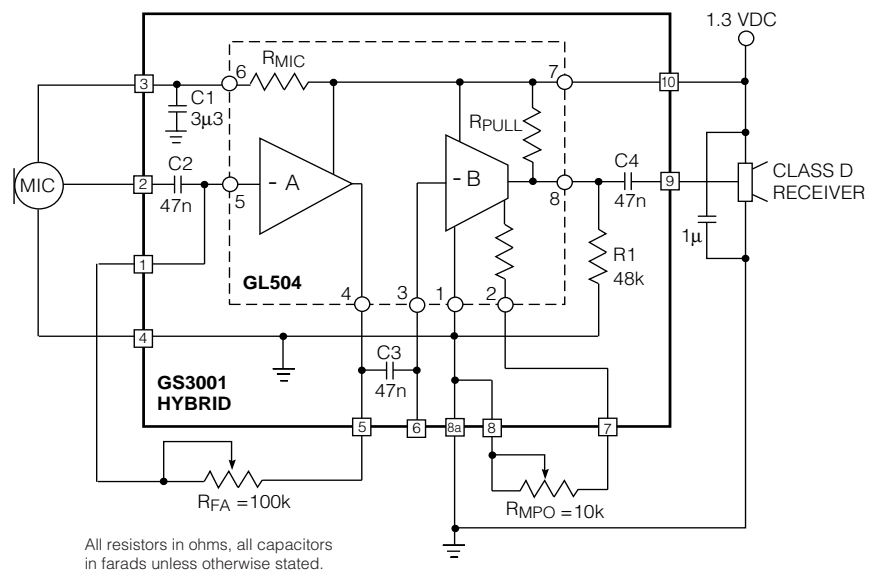


Fig. 2 Typical Hearing Instrument Application

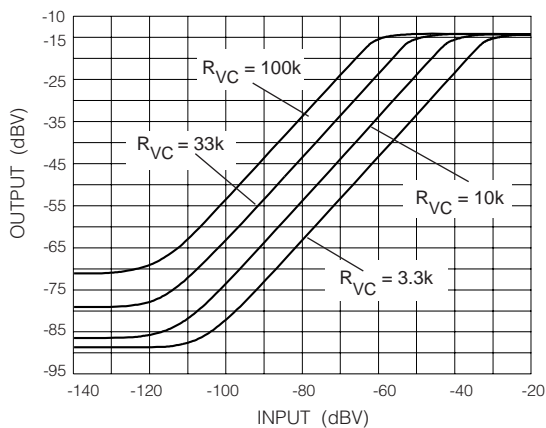


Fig. 3 I/O for Various R_{VC} Settings

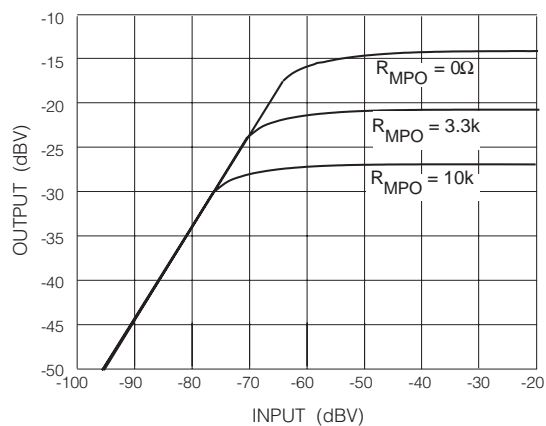


Fig. 4 I/O for Various R_{MPO} Settings

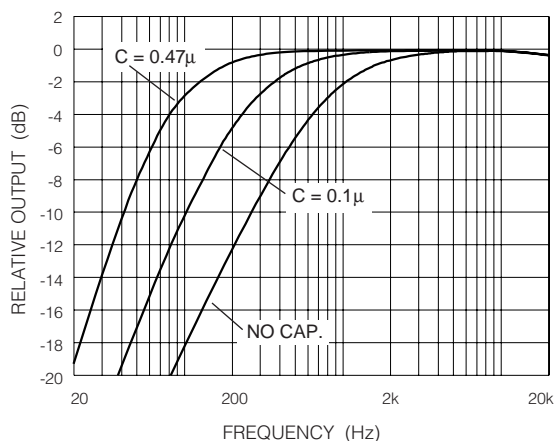


Fig. 5 Frequency Response for Various C/C_2 Values

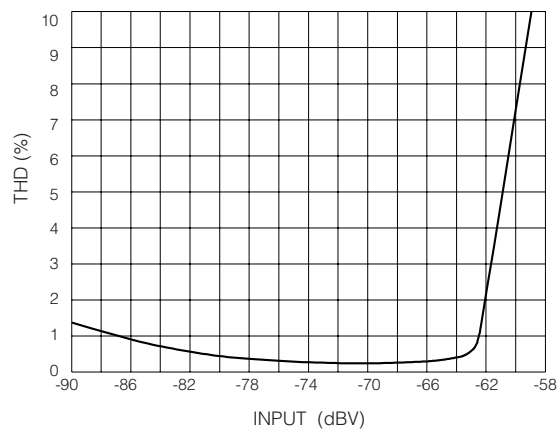


Fig. 6 Distortion vs Input Level ($R_{VC} = 100 k\Omega$)

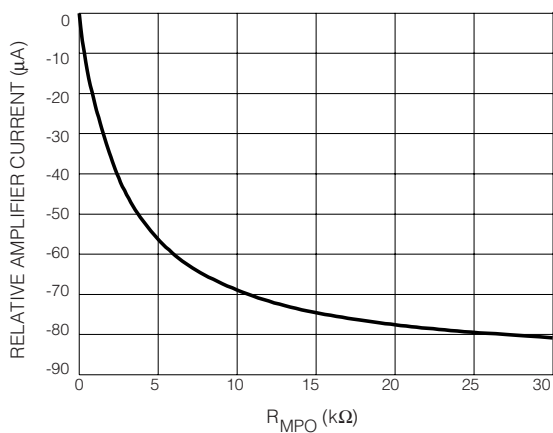


Fig. 7 Quiescent Current vs MPO Resistance

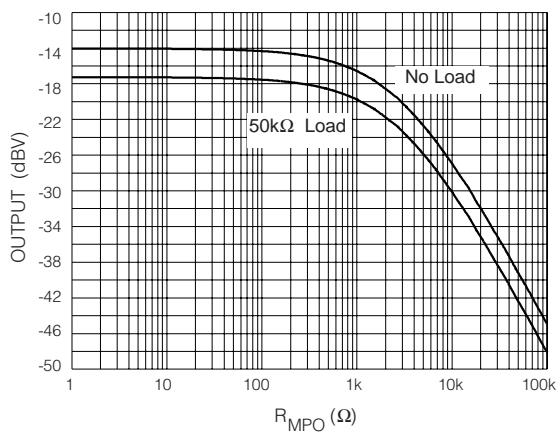


Fig. 8 Output vs MPO Resistance

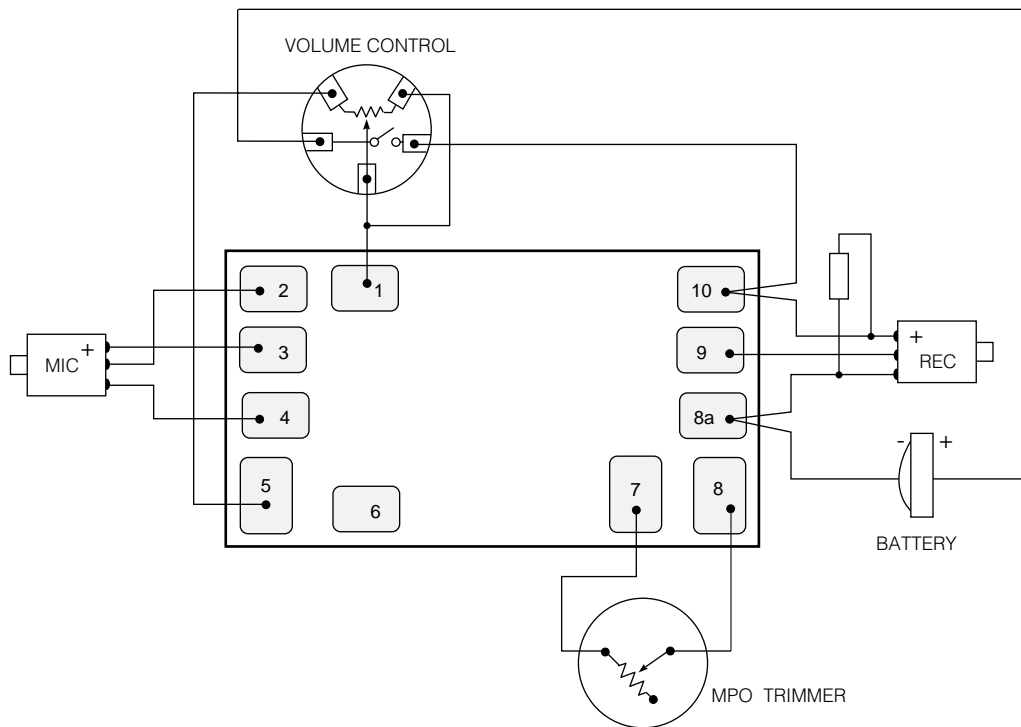


Fig. 9 Typical Assembly Diagram

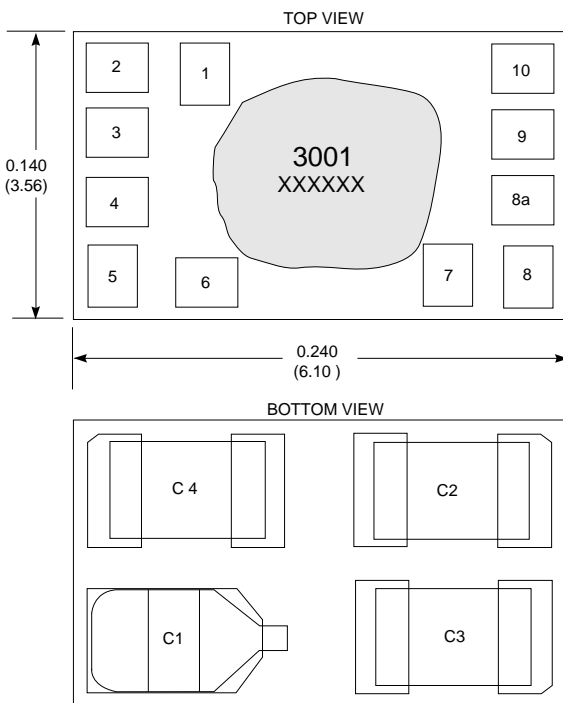


Fig. 10 Hybrid Layout and Dimensions

Dimensioning units are inches.
 Dimensions shown in parenthesis are
 in millimetres,
 converted from inches and include minor
 round off errors.
 1.0000 inches = 25.400mm
 Pad size 0.045 x 0.025 (1.14 x 0.64)
 Dimension tolerances ± 0.005 (+0.13)
 unless otherwise stated.
 XXXXXX - work order number.
 Pad numbers and capacitor numbers for
 illustration only.

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:

Updated to Data sheet