

## FEATURES

- designed to drive class D integrated receivers
- MPO range externally adjustable
- 150  $\mu$ A typical current drain
- 46 dB of adjustable gain
- low external parts count

## STANDARD PACKAGING

- 8 Pin MICROpac
- 8 Pin PLID®
- 8 Pin SLT
- Chip (56 x 56 mils)  
Au Bump

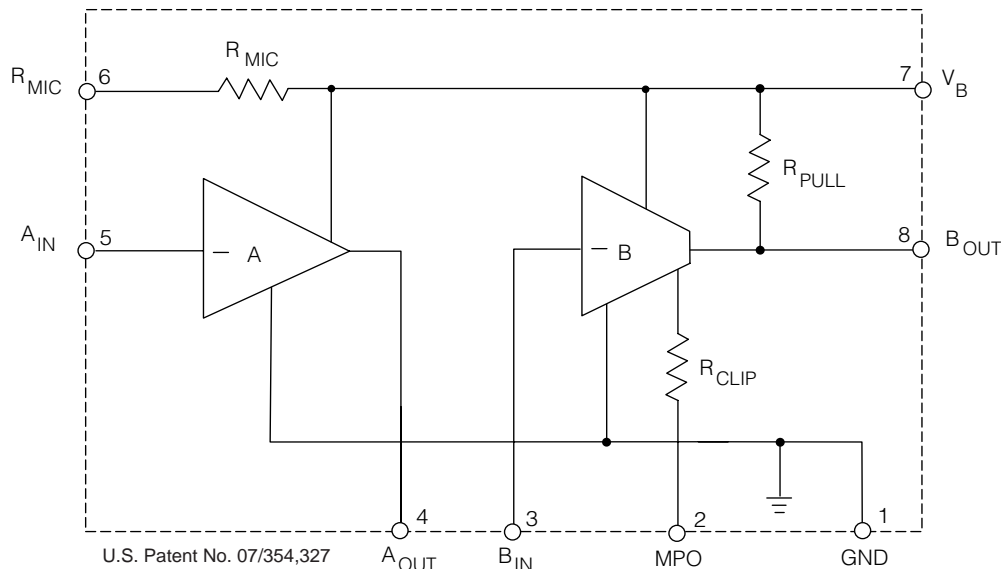
## DESCRIPTION

The GL504 is a low current preamplifier designed to drive the class D series of integrated receivers. This preamp has a built-in symmetrical peak clipping output limiter, 46 dB of adjustable gain, and requires few external components.

Composed of two stages, an inverting preamp with gain of 28 dB, and a transconductance block with gain of 18 dB, the GL504 is easily configured for mid-supply reference as required by the class D receivers.

The two stages of the GL504 must be AC coupled in order to maintain the DC bias conditions of each stage. Also, a 48 k $\Omega$  resistor, between the output and ground, is used to keep the receivers at mid-supply reference. The minimal total parts count, excluding an MPO variable resistor, requires 3 capacitors, a 100 k $\Omega$  volume control and the 48 k $\Omega$  bias resistor at the output.

The GL504 is capable of providing a flat frequency response with very little distortion.



**BLOCK DIAGRAM**

## ABSOLUTE MAXIMUM RATINGS

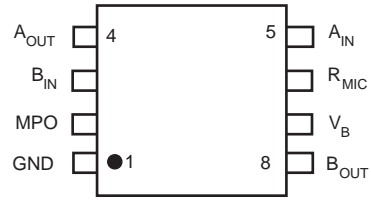
PARAMETER	VALUE / UNITS
Supply Voltage	5 V
Operating Temperature	-10°C to +40°C
Storage Temperature	-20°C to +70°C

### CAUTION

Class 1 ESD Sensitivity

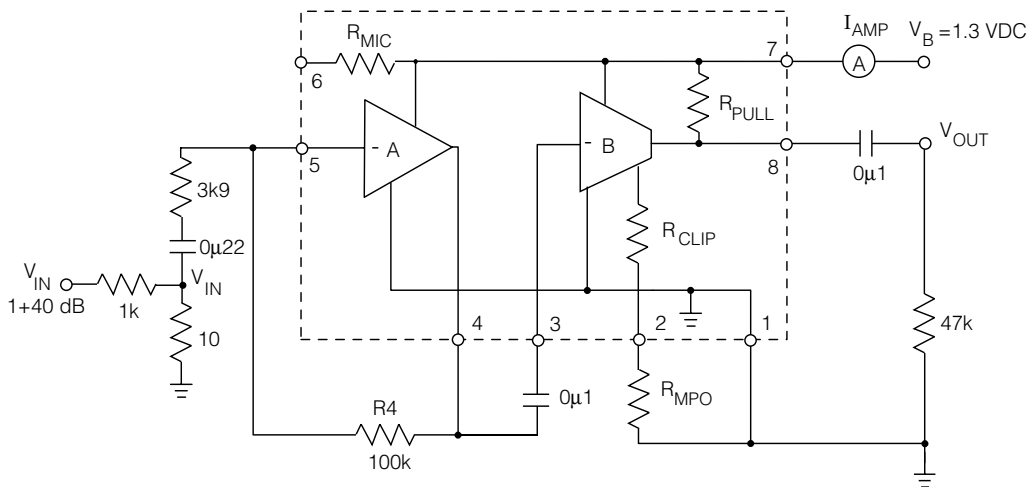


## PIN CONNECTION



## ELECTRICAL CHARACTERISTICS (refer to test circuit) Supply Voltage = 1.3 V, Test Frequency 1kHz

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Amplifier Current	$I_{AMP}$	$R_{MPO} = 0$	75	150	225	$\mu A$
Microphone Resistance	$R_{MIC}$		3.0	4.0	5.3	$k\Omega$
Input Referred Noise	IRN	NFB 0.2 to 10kHz at 12 dB/oct	-	2	-	$\mu V_{RMS}$
Gain	$A_V$	$V_{IN} = -80$ dBV	44.5	46.5	48.5	dB
MPO Level	MPO	$V_{IN} = -50$ dBV $R_{MPO} = 0$	-16	-14	-12	dBV
Change in MPO	$\Delta MPO$	$V_{IN} = -50$ dBV $R_{MPO} = 10$ $k\Omega$	10	12	14	dB
Preamplifier A input Bias Current	$I_{BIAS A}$		-25	0	+25	nA
Pull-up Resistance	$R_{PULL}$		40	48	58	$k\Omega$
Gain Loss	$\Delta GAIN$	$R_4 = 10$ k, $V_{IN} = -70$ dBV, $R_{MPO} = 50$ k	-	0	2.5	dB



All resistors in ohms, all capacitors in  $\mu F$ , unless otherwise stated.

Fig. 1 Test Circuit

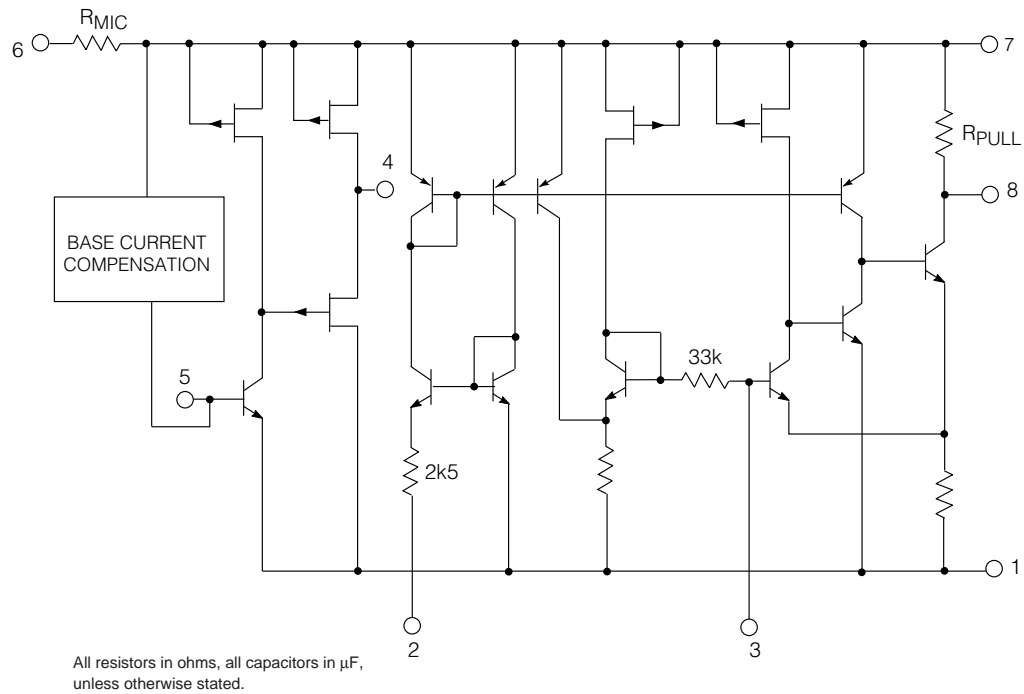


Fig. 2 Functional Schematic

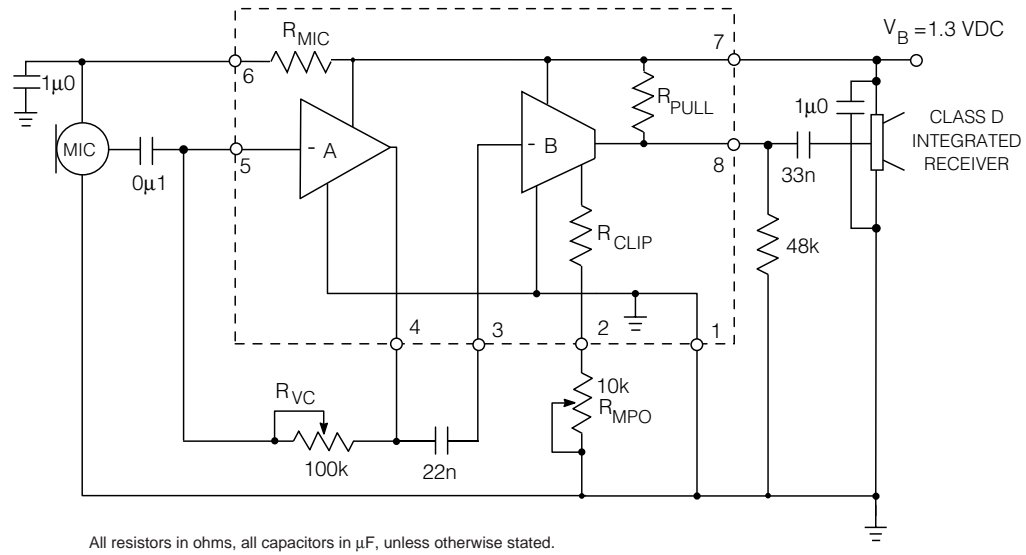


Fig. 3 Typical Application Circuit

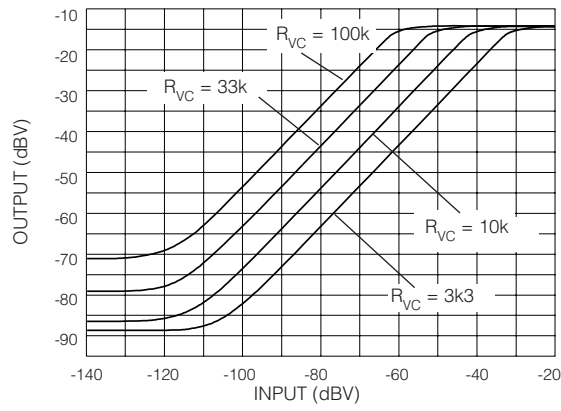


Fig. 4 I/O Curves at Various  $R_{VC}$  Settings

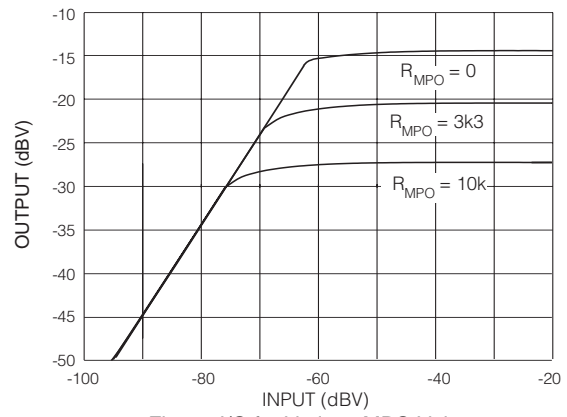


Fig. 5 I/O for Various MPO Values

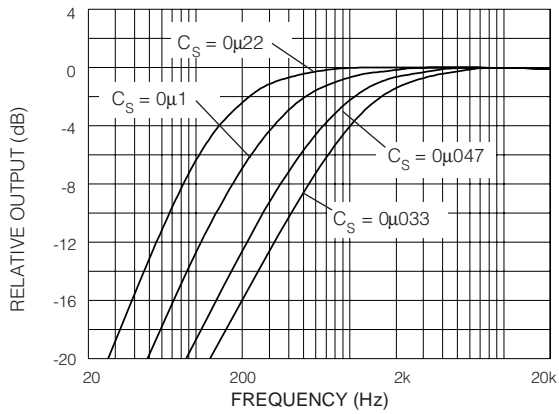


Fig. 6 Frequency Response for Various  $C_S$  Values

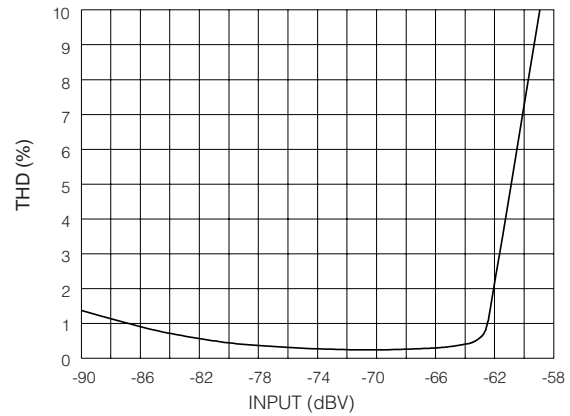


Fig. 7 Distortion vs Input Level ( $R_{VC}=100k\Omega$ )

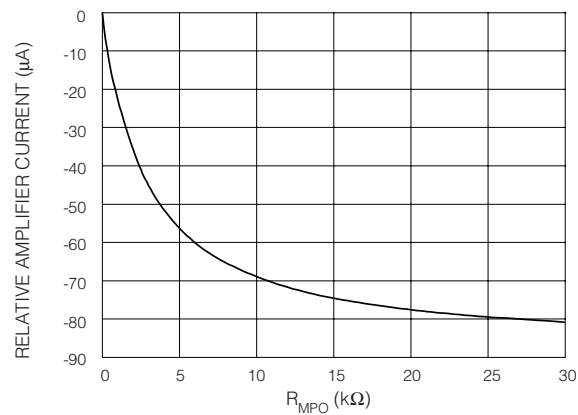


Fig. 8 Quiescent Current vs MPO Resistance

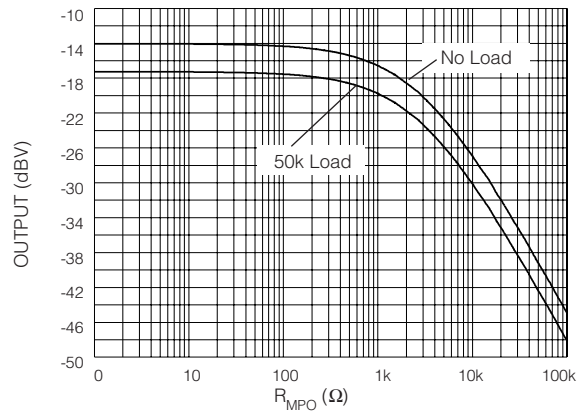


Fig. 9 Output vs MPO Resistance

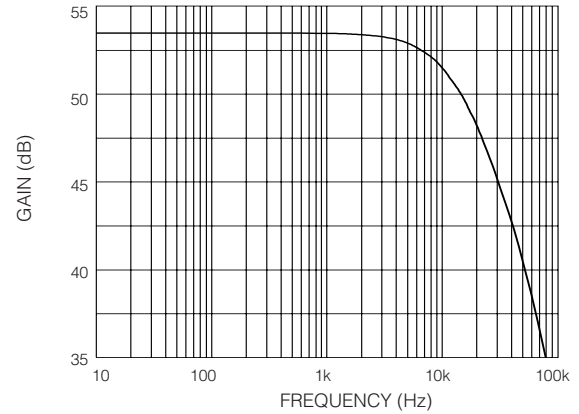


Fig. 10 Preamplifier A Open Loop Voltage Gain

**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