

FEATURES

- only 2 small capacitors required
- 200 to 10 kHz adjustable corner frequency
- dual 12 dB/Oct Butterworth filter (24 dB/Oct cascaded)
- 1.1 to 3.0 VDC operating range
- adjustable by a single potentiometer

STANDARD PACKAGING

- 8 pin MICROpac
- 8 pin PLID[®]
- Chip (66 x 61mils)

DESCRIPTION

The LF580 continuous analog filter consists of two second order (12 dB/oct), tunable (0.2 to 10 kHz) highpass Butterworth filter blocks.

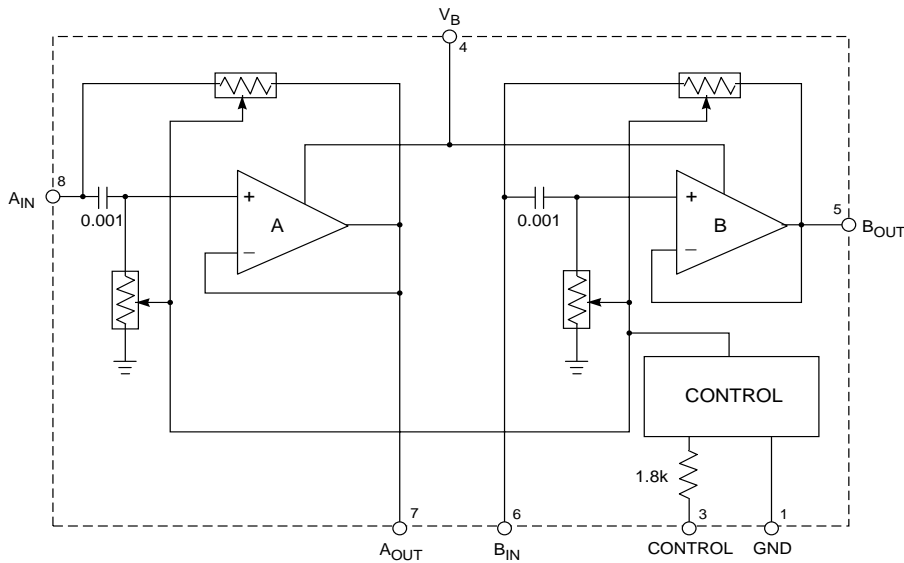
Tracking and corner frequency of each block are controlled by a single potentiometer. Cascading the two blocks together results in a single 24dB/oct high pass filter requiring only two external 0.001 μF capacitors for the filter response.

The output noise of each filter stage is typically 5.6μV. Cascading the two filter blocks together will produce a noise level which is

$$V_N = \sqrt{(V_{N1})^2 + (V_{N2})^2}$$

Where V_N is the total output noise of both filters, V_{N1} and V_{N2} is the noise of each filter.

To improve the signal-to-noise ratio of the filter the LF580 should be placed after a preamplifier, provided that the signal level does not exceed the maximum signal capability of 50mVRMS



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

BLOCK DIAGRAM

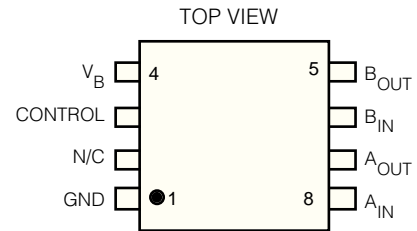
ABSOLUTE MAXIMUM RATINGS

PARAMETER	VALUE/UNITS
Supply Voltage	5 V DC
Operating Temperature Range	-10°C to 50° C
Storage Temperature Range	-40°C to 100° C

CAUTION
CLASS 1 ESD SENSITIVITY



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
Insertion Loss		$V_{IN} = 1 V_{RMS}$ Note 1	-	2	3	dB
Current Drain	I_T	$R_{CNT} = 100 k\Omega$	200	280	370	μA
Corner Frequency	f_C	$V_{IN} = 1 V_{RMS}$ Note 2	1300	1650	1900	Hz
Distortion	THD	$V_{IN} = 1.25 V_{RMS}$	-	2	5	%
Output Noise		Note 3	-	8	10	μV
Supply Rejection	SR	$V_B = 3.0V_{DC}$ Note 4	-	45	56	dB

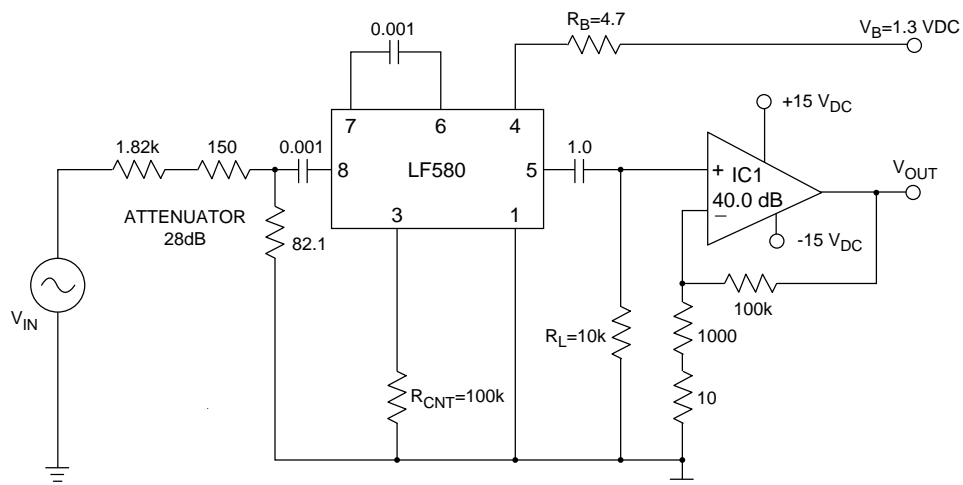
All parameters and switches remain as shown in Test Circuit unless otherwise stated in "Conditions" column

Notes 1: Insertion Loss = $20 \text{ Log}(V_{OUT}/V_{IN}) - 12$

- 2:** a) measure output voltage V_{OUT1} ($R_{CNT} = 100k\Omega$)
 b) measure output voltage V_{OUT2} ($R_{CNT} = 10.274k\Omega$)
 $f_C = 1000 \times 2 \times (V_{OUT1} / V_{OUT2})$

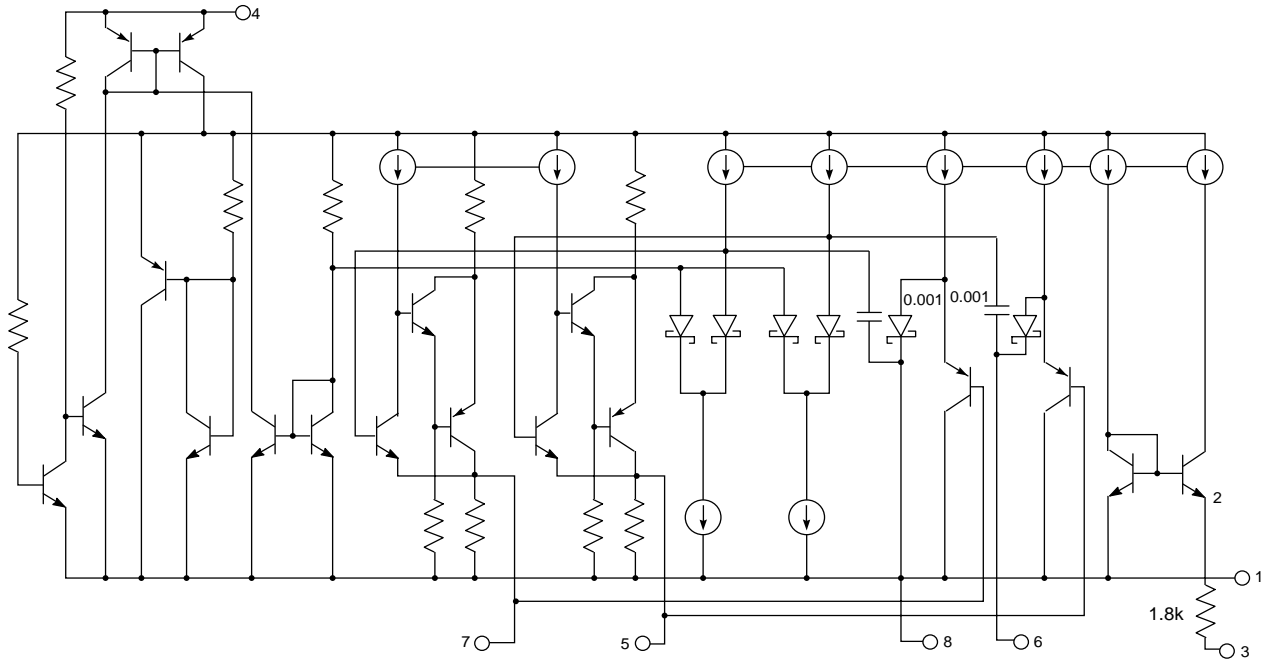
3: Output Noise = $V_{OUT} / 100$, filter bandwidth 200Hz to 10kHz at 12dB/Oct

- 4:** V_B modulated with $1V_{RMS}$ at 1 kHz
 Supply Rejection = $20 \text{ Log}(V_{OUT}) - 40$



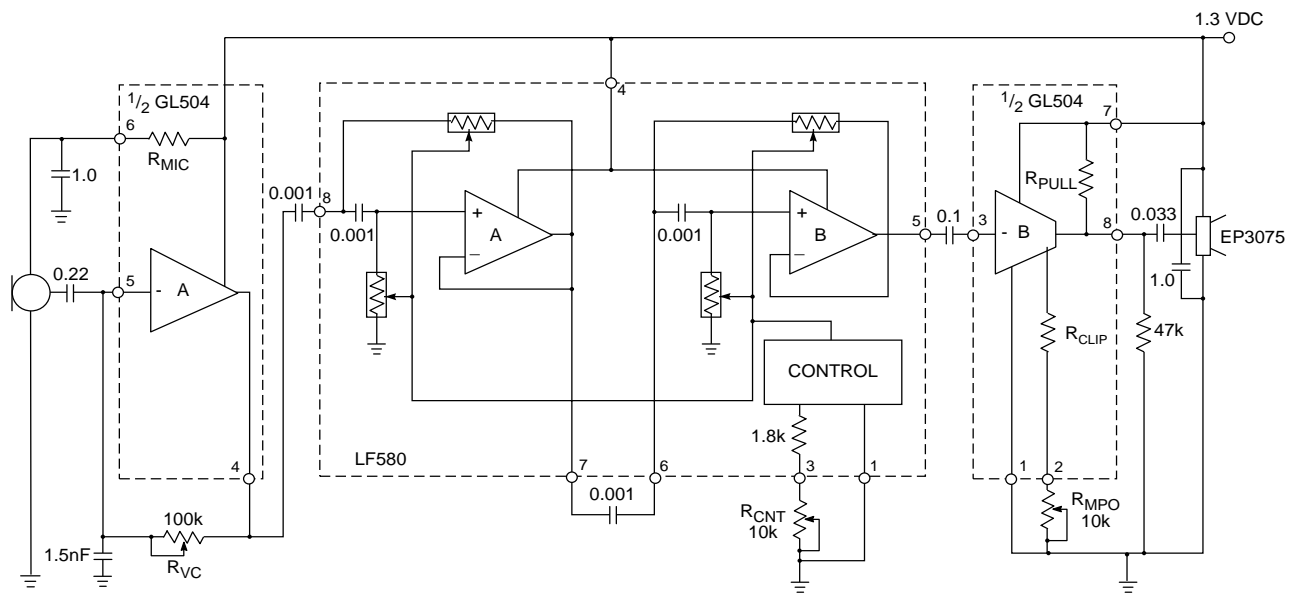
All resistors in ohms, all capacitors in microfarads unless otherwise stated in conditions column

Fig. 1 Test Circuit



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

Fig. 2 Functional Schematic



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

Fig. 3 GL504-LF580 Application Circuit

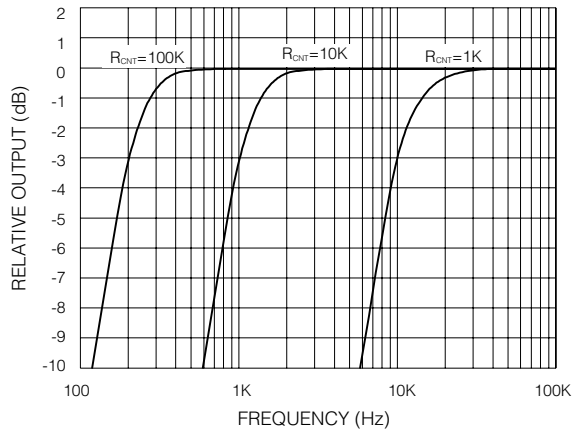


Fig. 4 Frequency Response at Various R_{CNT} Values

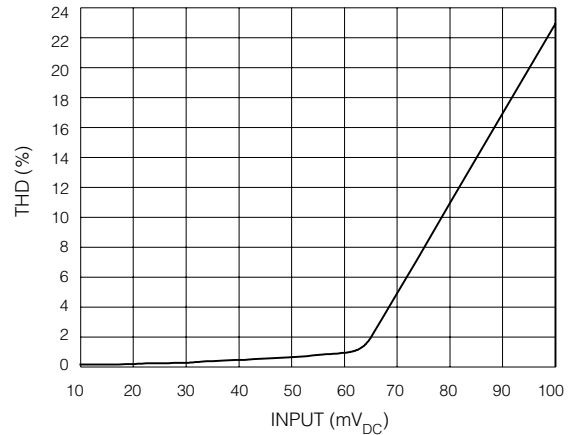


Fig. 5 Total Harmonic Distortion vs Input Level (measured at Pin 7)

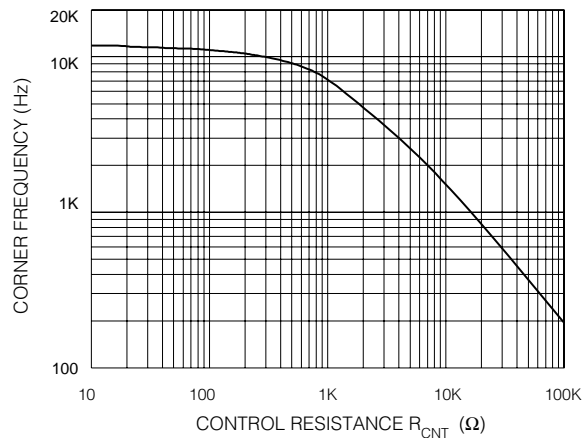


Fig. 6 Corner Frequency vs Control Resistance

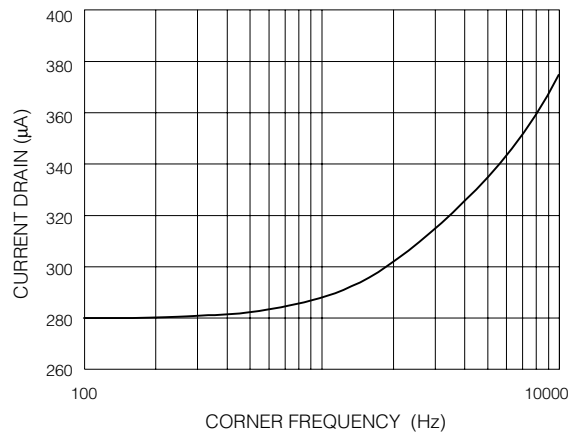


Fig. 7 Current Drain vs Corner Frequency

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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:

Changes to standard packaging information