Class A
Compression Amplifier

LD511 DATA SHEET

FEATURES

- **64 dB typical electrical gain**
- **0.94 VDC voltage regulator**
- **7 ms attack time, 40 ms release time**
- **15 dB threshold adjustment**
- **low noise and distortion**
- **compression ratio ∞ : 1**
- **0.3 kHz - 6 kHz frequency response**

STANDARD PACKAGING

- 10 pin MICROpac
- 10 pin MINIpac
- 10 pin PLID ®
- 10 pin SLT
- Chip (59 x 59 mils)
  Au Bump

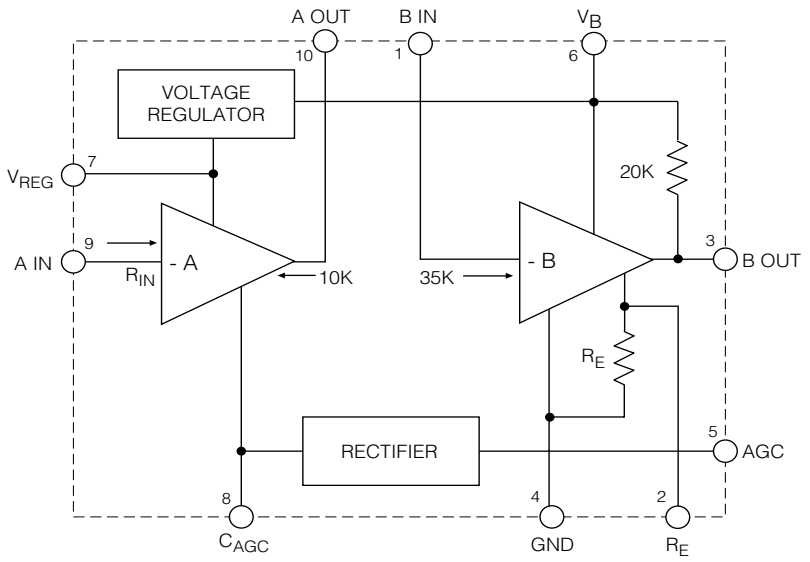
DESCRIPTION

The LD511 is a Class A compression amplifier which can operate over a range of DC battery voltages from 1.1 V to 2.4 V. A voltage regulator, which is independent of supply voltage variations, is on-chip to supply a stable 0.94 VDC bias to the amplifier circuitry and to the microphone.

The LD511, in compression, has approximately 15 dB of threshold adjustment by varying R_{TH} (see application circuit) and a compression function ratio of ∞ : 1.

Minimum attack and release times are fixed at 7 ms and 40 ms respectively and they can be adjusted simultaneously by changing the filter capacitor on pin 8, although the ratio of attack to release time is kept constant.

The output stage bias can be set to accommodate different receiver impedances by changing the value of R_E. The voltage across R_E (pin 2 to ground) is a constant 27 mV so the bias current is 27 mV divided by the total value of R_E in parallel with 500 Ω.



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

BLOCK DIAGRAM

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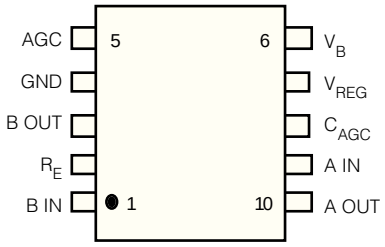
ABSOLUTE MAXIMUM RATINGS

PARAMETER	VALUE/UNITS
Supply Voltage	2.4 V DC
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

PIN CONNECTION



ELECTRICAL CHARACTERISTICS

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

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
COMPRESSION INACTIVE (S1 OPEN)						
Gain	A_V		60	64	68	dB
Input Referred Noise	IRN	NFB 0.2 - 10kHz at 12 dB/oct	-	2.0	4.0	µV
Total Harmonic Distortion	THD		-	1	3	%
Amplifier Current	I_{AMP}		-	0.4	0.6	mA
Transducer Current	I_{TRANS}		1.35	1.6	2.0	mA
Input Impedance	R_{IN}		-	15	-	kΩ
Regulated Voltage	V_{REG}		0.90	0.96	1.0	VDC
On Chip Emitter Resistance	R_E		-	500	-	Ω
Emitter Bias Voltage (pin 2)	V_{RE}		-	27	-	mV
COMPRESSION ACTIVE (S1 CLOSED)						
Compression Range			-	∞	-	dB
Total Harmonic Distortion	THD_{COMP}	V_2 = 1 mV	-	4.0	7.0	%
Attack Time	T_{ATT}	V_2 switched from 112µV to 2 mV	-	7	-	ms
Release Time	T_{REL}		-	40	-	ms
Compression Output	$V_{COMPOUT}$	V_2 = 1 mV	-	0.10	0.18	VRMS
Compression Output Change	$\Delta V_{COMPOUT}$	V_2 = 120 mV; Note 1	-	13	20	mVRMS

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

Notes: **1.** $\Delta V_{COMPOUT} = V_{OUT}[V_2 = 120mV] - V_{COMPOUT}$

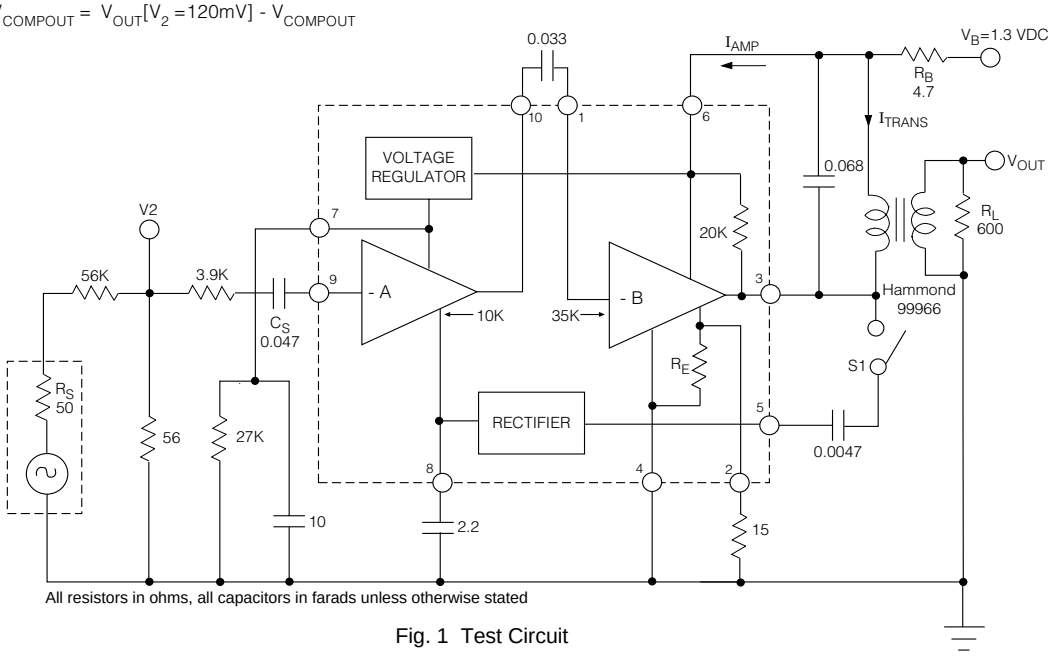


Fig. 1 Test Circuit

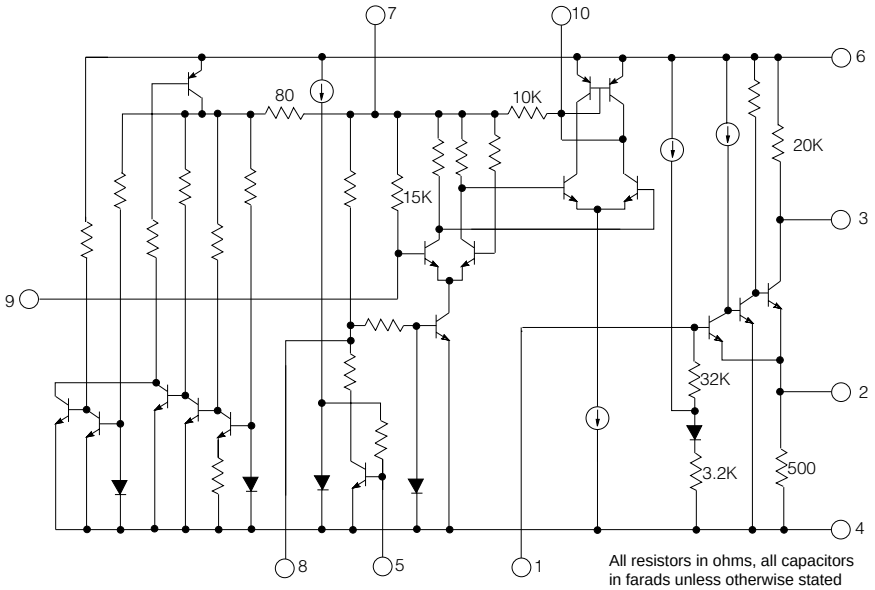


Fig. 2 Functional Schematic

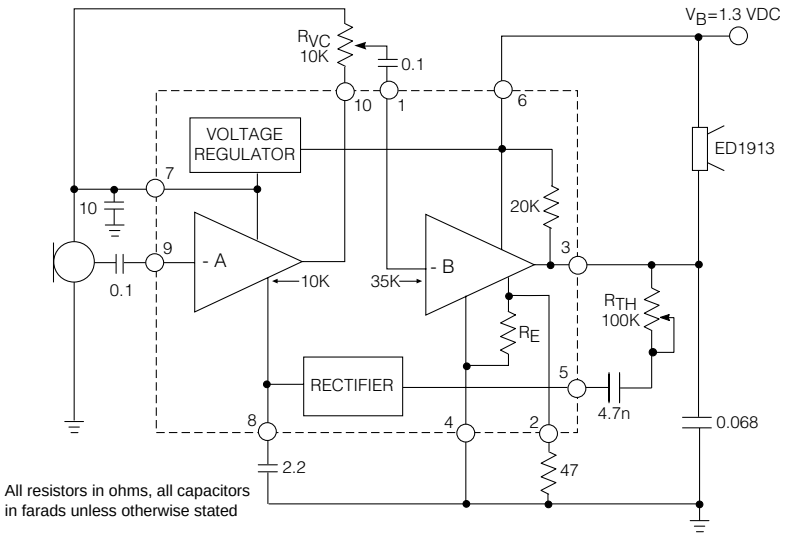


Fig. 3 LD511 Stand Alone Application Circuit

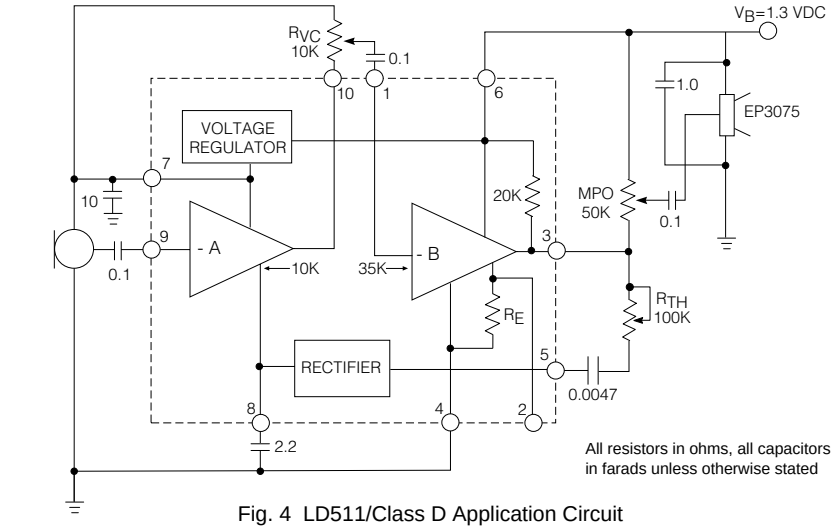


Fig. 4 LD511/Class D Application Circuit

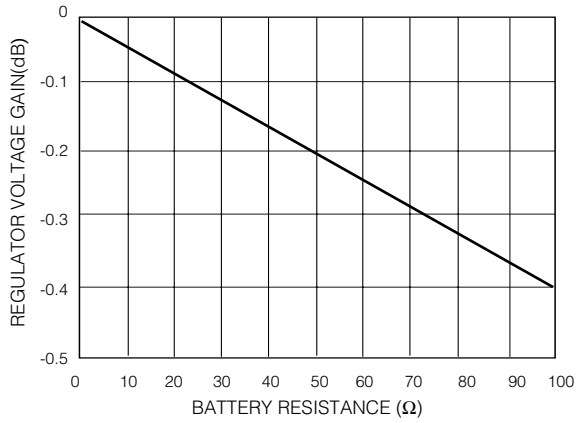


Fig. 5 Voltage Gain vs Battery Resistance

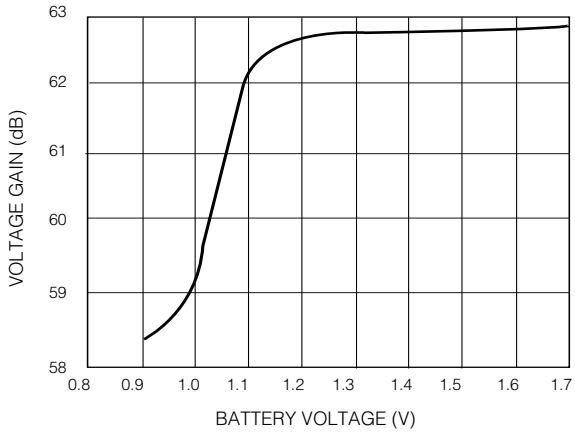


Fig. 6 Voltage Gain vs Battery Voltage

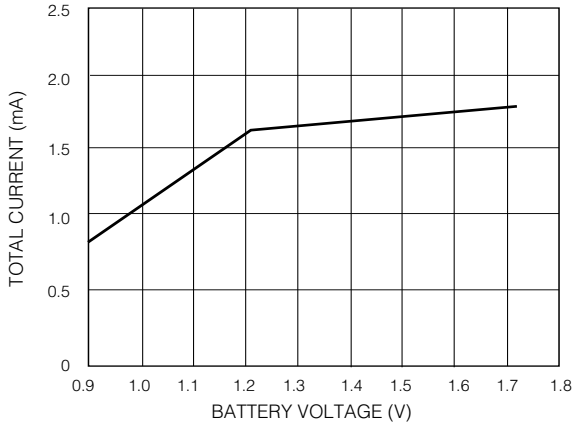


Fig. 7 Total Current vs Battery Voltage

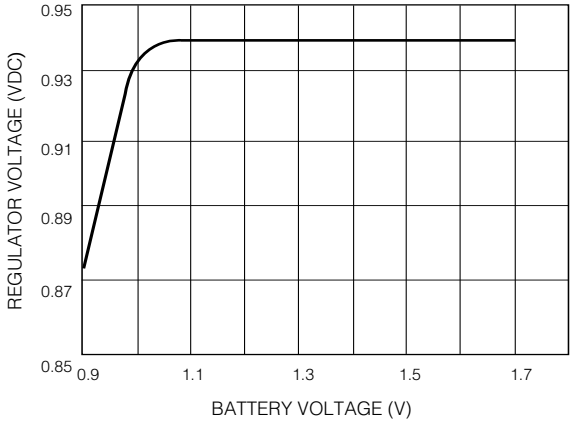


Fig. 8 Regulator Voltage vs Battery Voltage

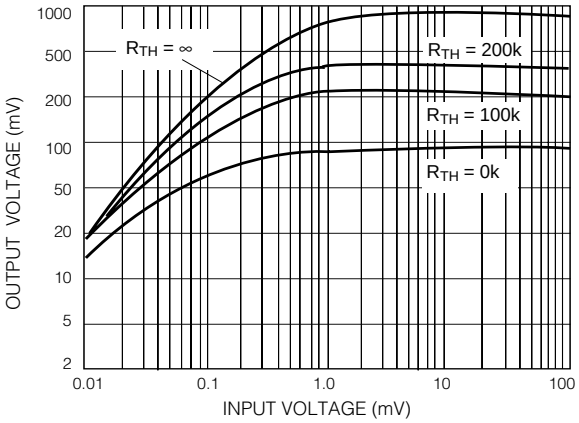


Fig. 9 Threshold Adjustment

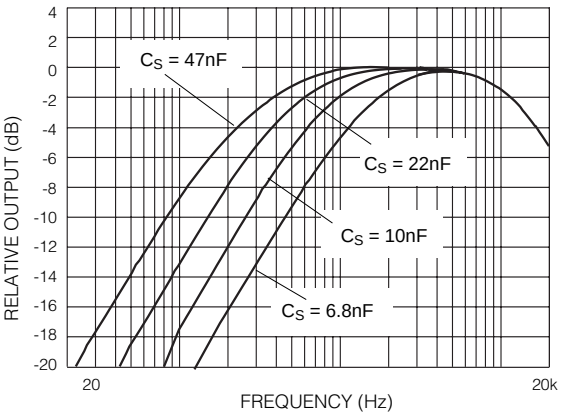


Fig. 10 Frequency Response at Various C_S Values

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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