

FEATURES

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

STANDARD PACKAGING

Hybrid Typical Dimensions:

$$0.0945 \times 0.1115 \times 0.042 \text{ in}$$
$$(2.40 \times 2.83 \times 1.07 \text{ mm})$$

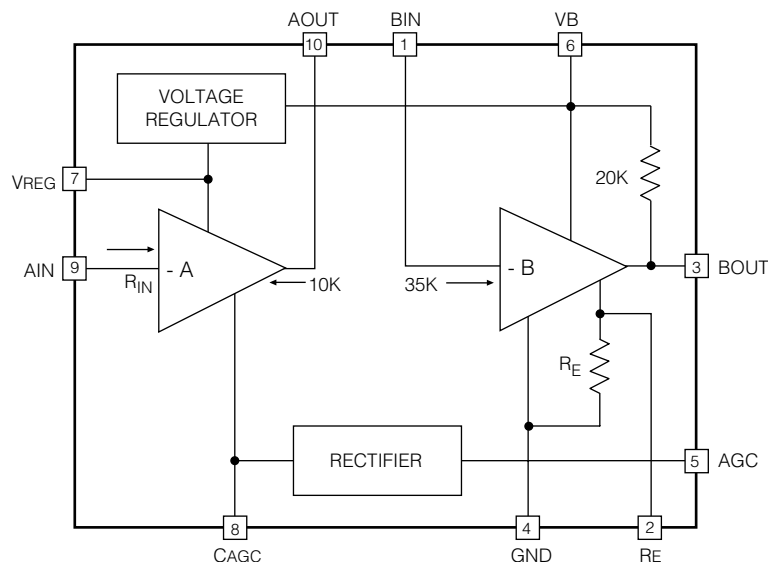
DESCRIPTION

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

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

Minimum attack and release times are fixed at 7ms and 40ms 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 27mV so the bias current is 27mV 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

ABSOLUTE MAXIMUM RATINGS

PARAMETER	VALUE/UNITS
Supply Voltage	2.4VDC
Power Dissipation	25mW
Operating Temperature Range	-10°C to 40°C
Storage Temperature Range	-20°C to 70°C

PAD CONNECTIONS

VB	6	5	AGC
VREG	7	4	GND
CAGC	8	3	BOUT
AIN	9	2	RE
AOUT	10	1	BIN

CAUTION

ELECTROSTATIC
SENSITIVE DEVICES
DO NOT OPEN PACKAGES OR HANDLE
EXCEPT AT A STATIC-FREE WORKSTATION



CAUTION

MOISTURE
SENSITIVE DEVICES
DO NOT OPEN PACKAGES EXCEPT UNDER
CONTROLLED CONDITIONS



ELECTRICAL CHARACTERISTICS

Conditions: Frequency = 1kHz, Temperature = 25°C, Supply Voltage $V_B = 1.3\text{VDC}$

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 12dB/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	-	$k\Omega$
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}	$V_2 = 1\text{mV}$	-	4.0	7.0	%
Attack Time	T_{ATT}	V_2 switched from 112 μV to 2mV	-	7	-	ms
Release Time	T_{REL}		-	40	-	ms
Compression Output	$V_{COMPOUT}$	$V_2 = 1\text{mV}$	-	0.10	0.18	V_{RMS}
Compression Output Change	$\Delta V_{COMPOUT}$	$V_2 = 120\text{mV}$; Note 1	-	13	20	mV $_{RMS}$

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

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

Fig. 1 Test Circuit

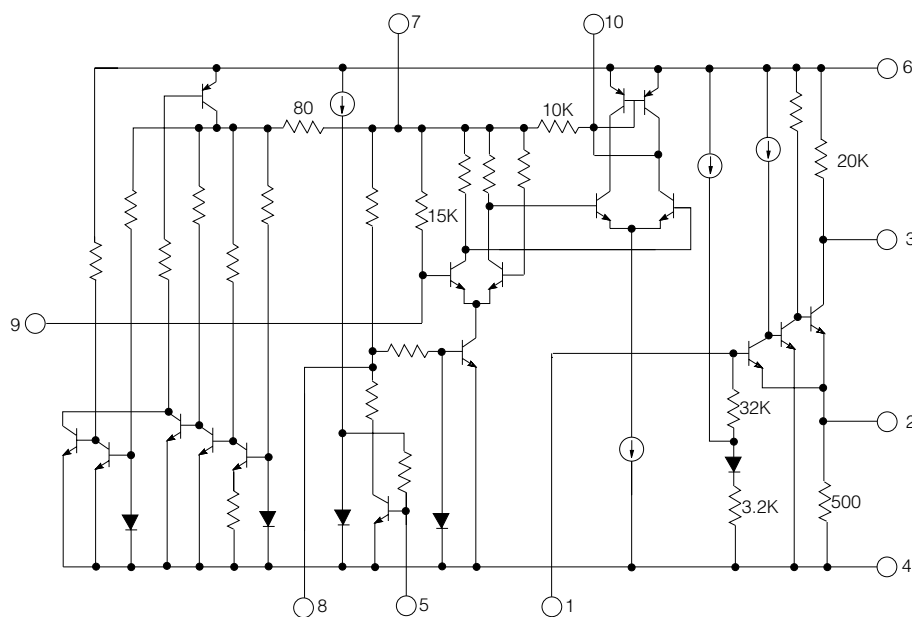


Fig. 2 Functional Schematic

Fig. 3 LD511 Stand Alone Application Circuit

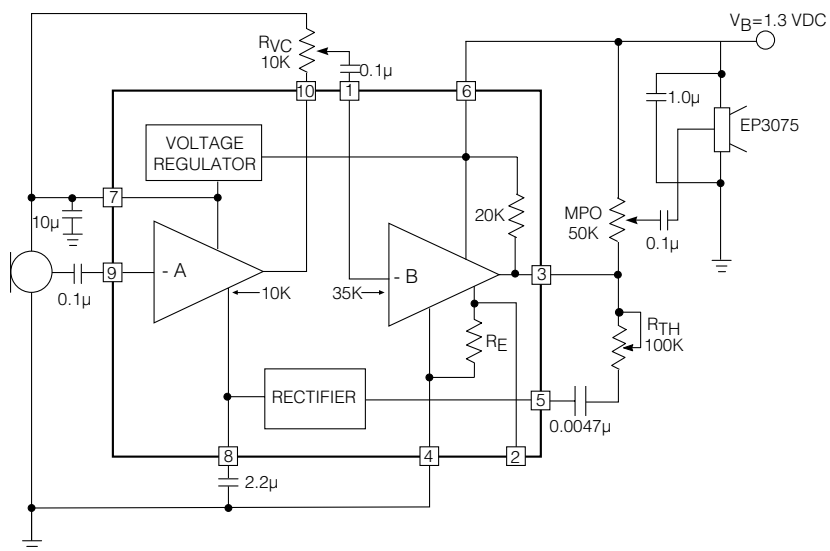


Fig. 4 LD511/Class D Application Circuit

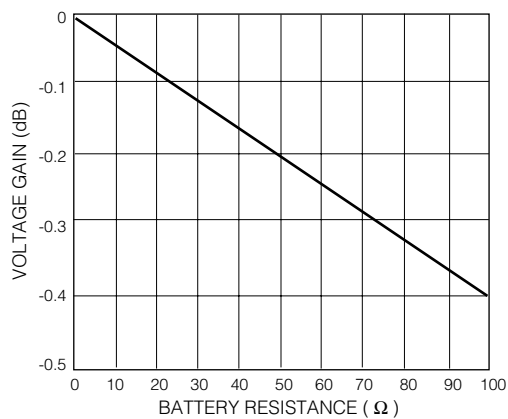


Fig. 5 Voltage Gain vs Battery Resistance

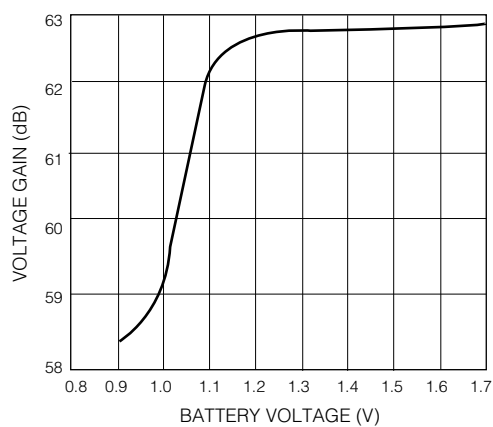


Fig. 6 Voltage Gain vs Battery Voltage

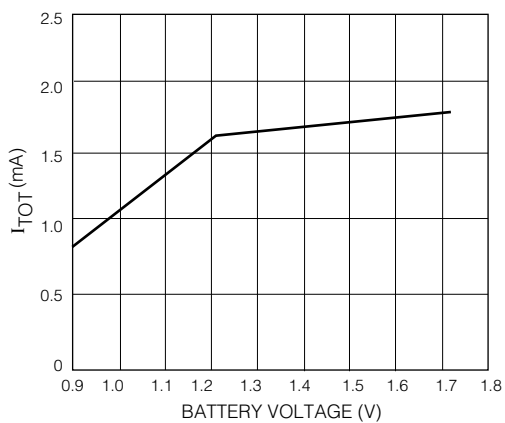


Fig. 7 Total Current vs Battery Voltage

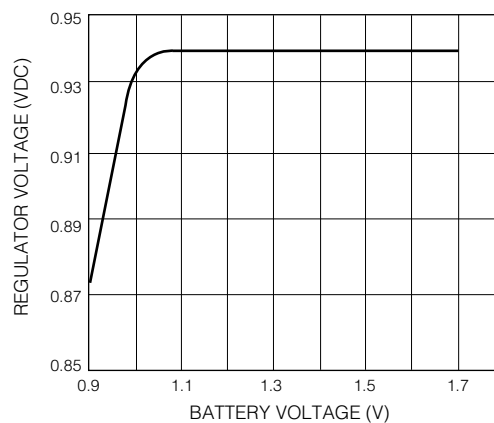


Fig. 8 Regulator Voltage vs Battery Voltage

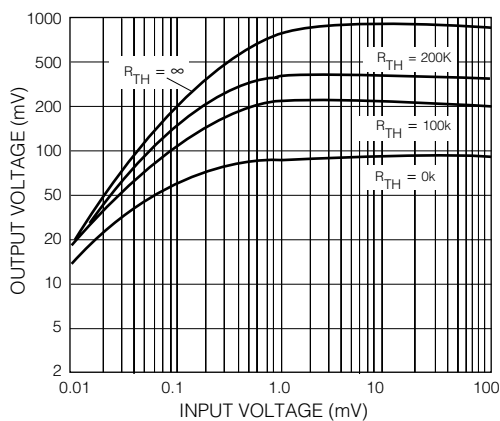


Fig. 9 Threshold Adjustment

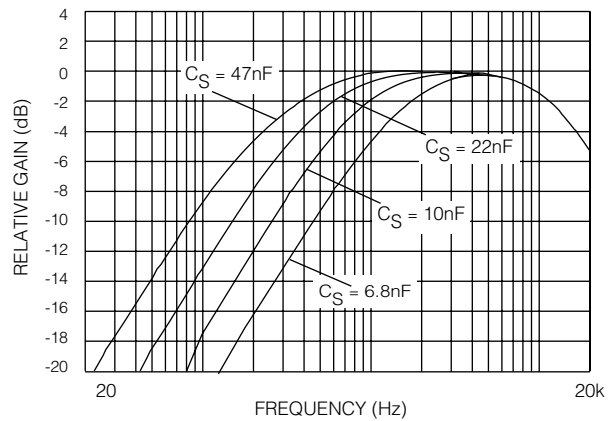
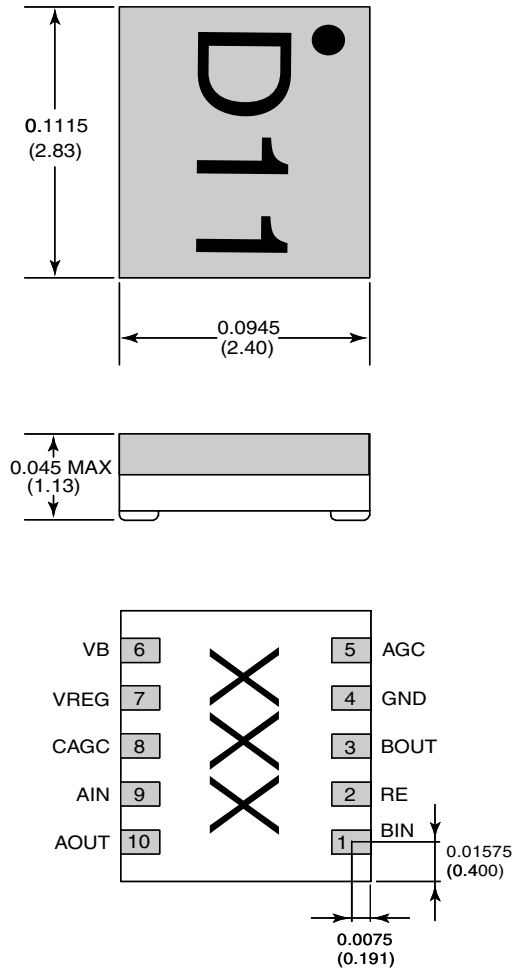


Fig. 10 Frequency Response at Various C_S Values

PACKAGE DIMENSIONS



PAD DIMENSIONS

PAD NO.	PAD POSITION		PAD DIMENSION		
	X	Y	Xdim	Ydim	
1	0	0	15	10	MIL
2	0	20	15	10	
3	0	40	15	10	
4	0	60	15	10	
5	0	80	15	10	
6	-79.5	80	15	10	
7	-79.5	60	15	10	
8	-79.5	40	15	10	
9	-79.5	20	15	10	
10	-79.5	0	15	10	
1	0	0	0.381	0.254	mm
2	0	0.508	0.381	0.254	
3	0	1.016	0.381	0.254	
4	0	1.524	0.381	0.254	
5	0	2.032	0.381	0.254	
6	-2.019	2.032	0.381	0.254	
7	-2.019	1.524	0.381	0.254	
8	-2.019	1.016	0.381	0.254	
9	-2.019	0.508	0.381	0.254	
10	-2.019	0	0.381	0.254	

Dimensions are in inches.

Dimensions in paranthesis are in millimeters converted from inches and include minor rounding errors.

1.0000 inches = 25.400 mm

Dimensions tolerances ± 0.003 (± 0.08) unless otherwise stated.

Minimum Pad size 0.010 x 0.015 (0.254 x 0.381)

XXX = Last 3 digits of work order number

This hybrid is designed for either point-to-point manual soldering or for reflow according to Gennum's reflow process (Information Note 521-45).

LD511 - HYB

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:

Moisture sensitivity symbol added. Information added that this hybrid is designed for reflow.

GENNUM CORPORATION

MAILING ADDRESS:
P.O. Box 489, Stn A, Burlington Ontario, Canada L7R 3Y3
Tel. +1 (905) 632-2996 fax: +1 (905) 632-2814

SHIPPING ADDRESS:
970 Fraser Drive, Burlington, Ontario, Canada L7L 5P5

GENNUM JAPAN CORPORATION

Shinjuku Green Tower Building 27F, 6-14-1, Nishi Shinjuku,
Shinjuku-ku, Tokyo, 160-0023 Japan
Tel. +81 (03) 3349-5501, Fax. +81 (03) 3349-5505

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