LOW VOLTAGE AUDIO POWER AMPLIFIER AZ386

General Description

The AZ386 is a power amplifier designed for use in low voltage consumer applications. The gain is internally set to 20dB to keep external part count low, but the addition of an external resistor and capacitor between pins 1 and 8 will increase the gain to any value from 20 to 200dB.

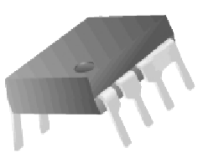
The inputs are ground referenced while the output automatically biases to one-half the supply voltage. The quiescent power drain is only 24mW when operating from a 6V supply, making the AZ386 ideal for battery operation.

Features

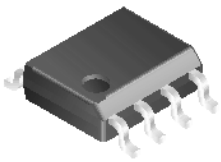
- Wide supply voltage range: 5V to 18V
- Low quiescent current drain: 4.5mA
- Voltage gains from 20 to 200dB
- Battery operation
- Minimum external parts
- Low power dissipation
- Low distortion

Applications

- AM - FM radio amplifier
- Cordless phone
- TV sound systems
- Portable tape player amplifier
- Intercoms
- Line drivers
- Ultrasonic drivers
- Small servo drivers
- Power converters



DIP-8

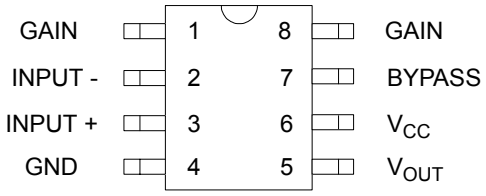


SOIC-8

Figure 1. Package Types of AZ386

Pin Configuration

M Package/P Package
(SOIC-8/DIP-8)



Top View

Figure 2. Pin Configuration of AZ386

Functional Block Diagram

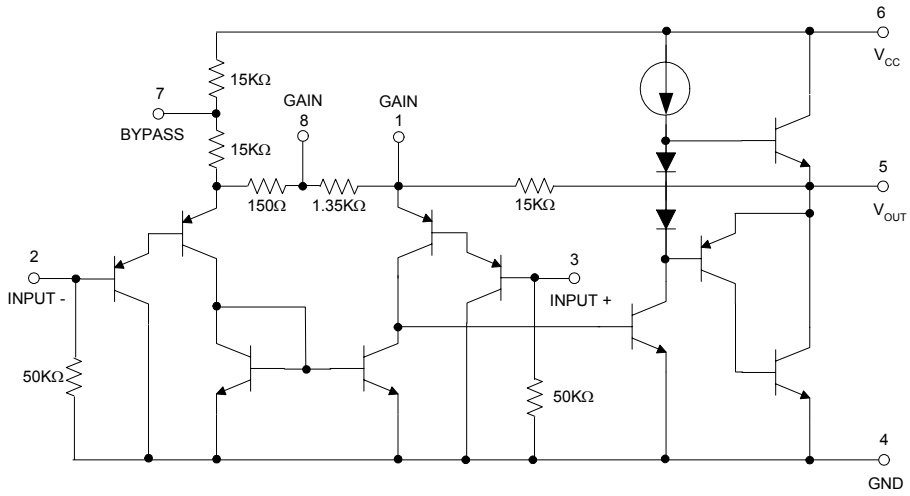


Figure 3. Functional Block Diagram of AZ386

Ordering Information

Package	Temperature Range	Part Number	Marking ID	Packing Type
SOIC-8	-40°C~85°C	AZ386M	386M	Tube/Tape/Reel
DIP-8		AZ386P	AZ386P	Tube

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value		Unit
Power Supply Voltage	V_{CC}	20		V
Package Dissipation (Note 2)	P_D	AZ386P	1.25	W
		AZ386M	0.73	W
Input Voltage	V_{IN}	-0.4		V
Operating Temperature Range	T_{OP}	-40 to 85		°C
Junction Temperature	T_J	150		°C
Storage Temperature Range	T_{STG}	-65 to 150		°C
Soldering Information		DIP-8 Soldering (10 sec.)	260	°C
		SOIC-8 (15 sec.)	215	
Thermal Resistance	θ_{JA}	DIP	107	°C/W
		SOIC	172	

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operatiing Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Note 2: For operation in ambient temperatures (T_A) above 25°C, the device must be derated based on a 150°C maximum junction temperature and 1) a thermal resistance of 107°C/W junction to ambient for the dual-in-line package and 2) a thermal resistance of 170°C/W for the small outline package.

Electrical Characteristics (Note 3)

Operating Conditions: T_A=25°C unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC}		5		18	V
Quiescent Current	I_Q	V_{CC} = 6V, V_{IN} = 0		4.5	8	mA
Output Power	P_{OUT}	V_{CC} = 6V, R_L = 8Ω, THD = 10%	250	325		mW
		V_{CC} = 9V, R_L = 8Ω, THD = 10%	500	700		mW
		V_{CC} = 16V, R_L = 32Ω, THD = 10%	700	1000		mW
Voltage Gain	G_V	V_{CC} = 6V, f = 1KHz 10μF from Pin 1 to 8		26		dB
				46		dB
Bandwidth	BW	V_{CC} = 6V, Pins 1 and 8 open		300		KHz
Total Harmonic Distortion	THD	V_{CC} = 6V, R_L = 8Ω, P_{OUT} = 125mW f=1KHz, Pins 1 and 8 open		0.2		%
Power Supply Rejection Ratio	PSRR	V_{CC} = 6V, f=1KHz, C_{BYPASS} = 10μF, Pins 1 and 8 open, Referred to Output		50		dB
Input Resistance	R_{IN}			50		KΩ
Input Bias Current	I_{BIAS}	V_{CC} = 6V, Pin 2 and 3 open		250		nA

Note 3: All voltages are measured with respect to the ground pin, unless otherwise specified.

Typical Performance Characteristics

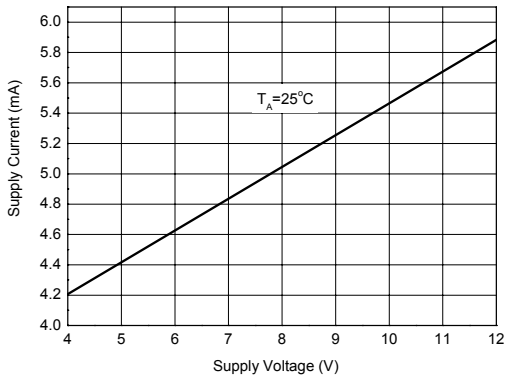


Figure 4. Quiescent Supply Current vs. Supply voltage

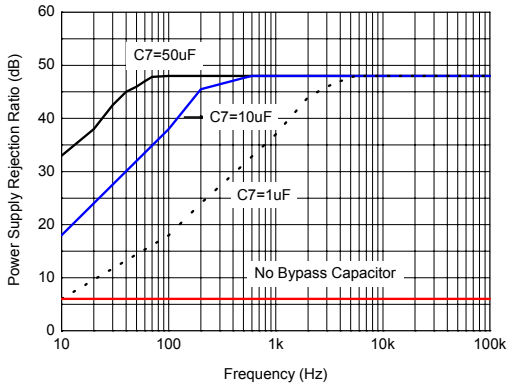


Figure 5. Power Supply Rejection Ratio (Referred to the Output) vs. Frequency

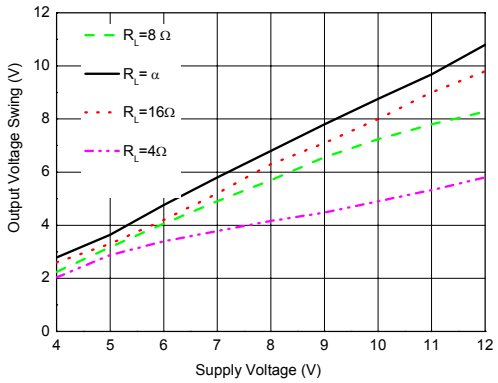


Figure 6. Peak-to-Peak Output Voltage Swing vs. Supply Voltage

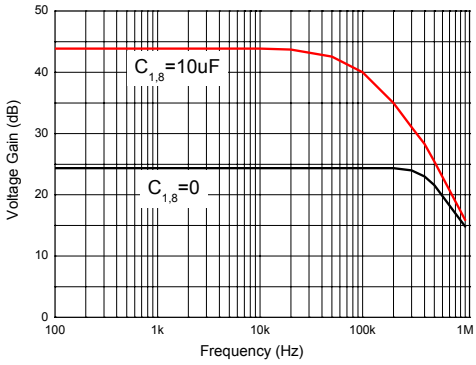


Figure 7. Voltage Gain vs. Frequency

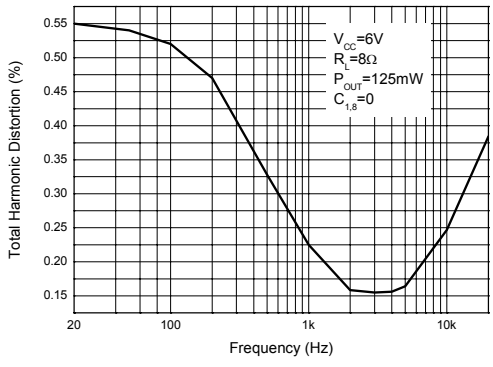


Figure 8. Distortion vs. Frequency

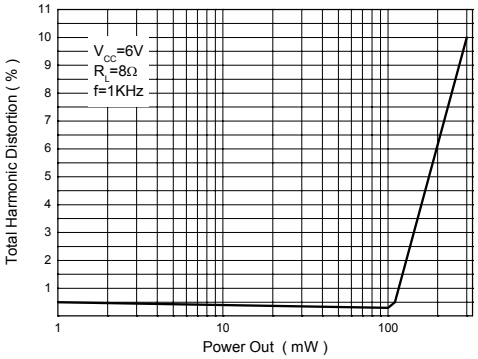


Figure 9. Distortion vs. Output Power

Typical Performance Characteristics (Continued)

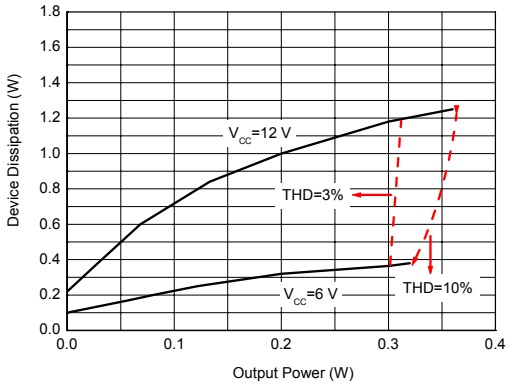


Figure 10. Device Dissipation vs. Output Power (4Ω Load)

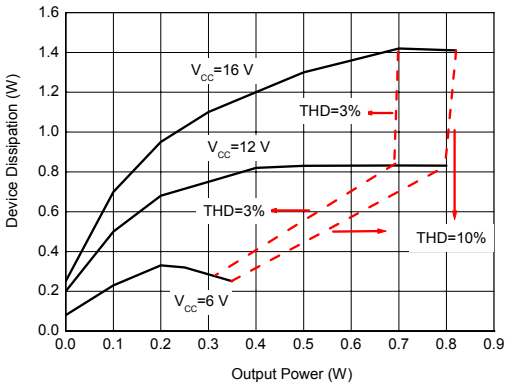


Figure 11. Device Dissipation vs. Output Power (8Ω Load)

Typical Applications

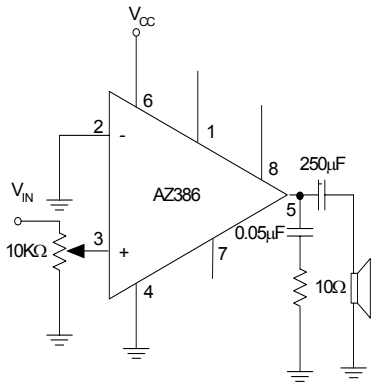


Figure 13. Amplifier With Gain = 20dB

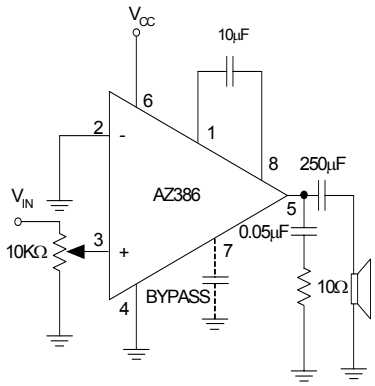


Figure 14. Amplifier With Gain = 200dB

Typical Applications (Continued)

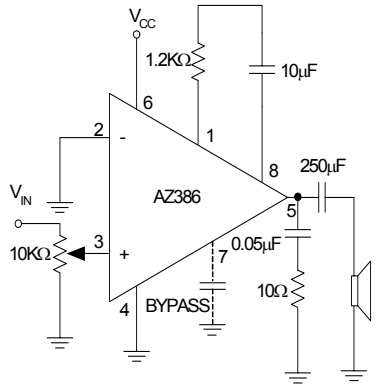


Figure 15. Amplifier With Gain = 50dB

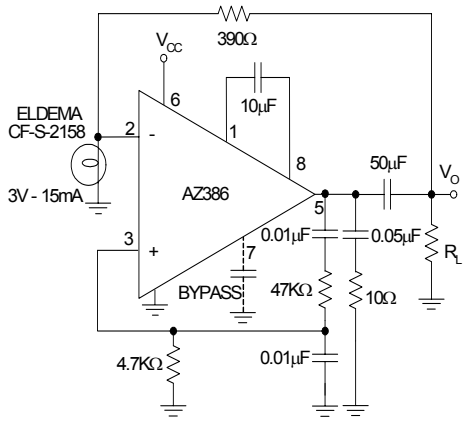


Figure 16. Low Distortion Power Wienbridge Oscillator

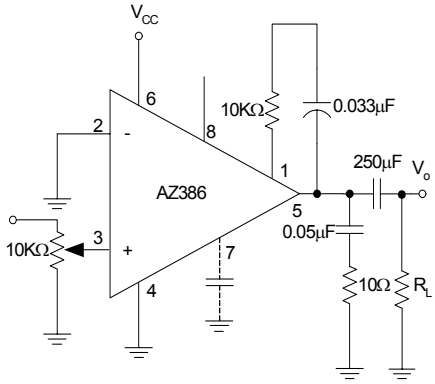


Figure 17. Amplifier With Bass Boost

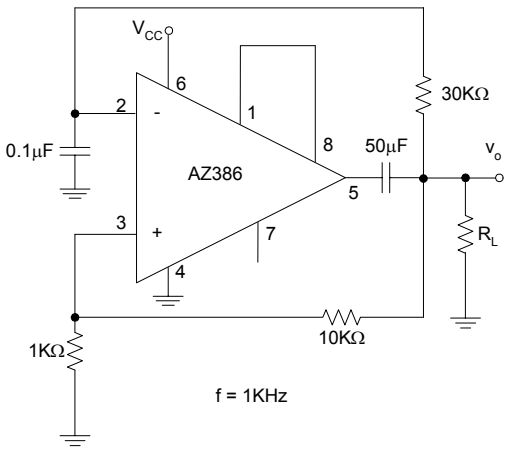
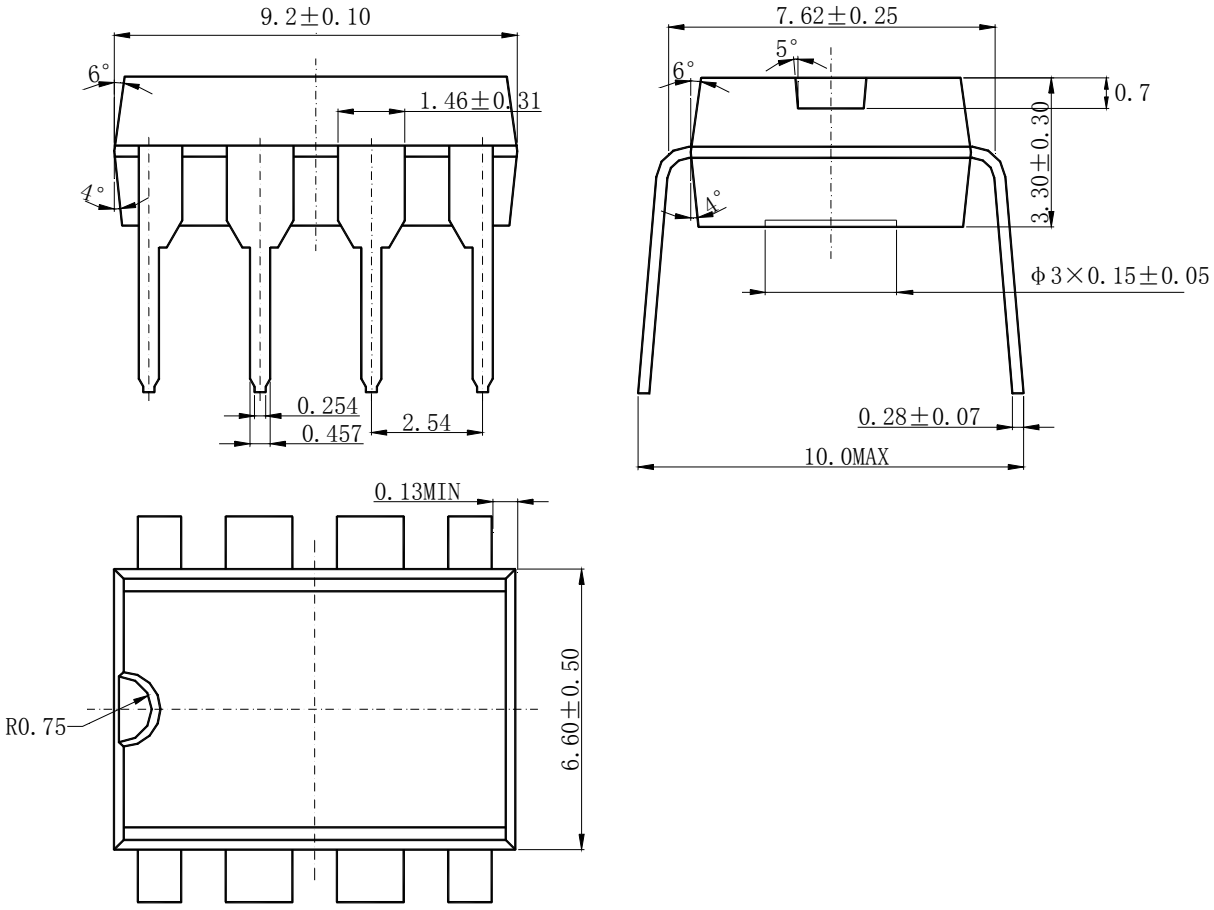


Figure 18. Square Wave Oscillator

Mechanical Dimensions

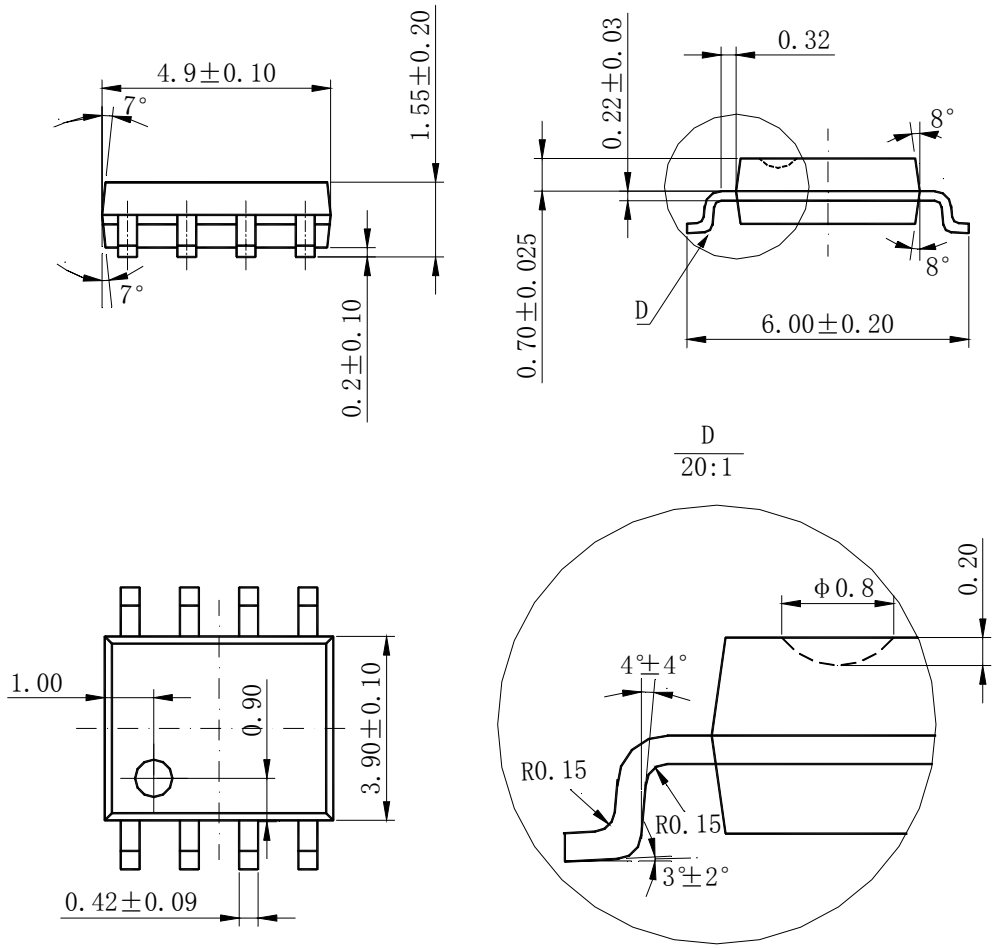
DIP-8 Unit: mm



Mechanical Dimensions (Continued)

SOIC-8

Unit: mm



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http://www.aacmicro.com

USA: 860 Hillview Court, Suite 160, Milpitas, CA 95035, USA Tel: 408-586 8809, Fax: 408-586 8801

China: 8th Floor, Zone B, 900 Yi Shan Road， Shanghai 200233, China Tel: 86-21-6495-9539, Fax: 86-21-6485-9673

Taiwan: Room 2210, 22nd Fl, 333, Keelung Road, Sec.1, Taipei 110, Taiwan Tel: 886-2-2758 6828, Fax: 886-2-2758 6892

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