



THE DATASHEET OF AZ386P-E1



**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 20 to keep external part count low, but the addition of an external resistor and capacitor between pin 1 and pin 8 will increase the gain to any value from 20 to 200.

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 5V supply, making the AZ386 ideal for battery operation.

This IC is available in SOIC-8 and DIP-8 packages.

Features

- Wide Supply Voltage Range: 4V to 16V
- Low Quiescent Current Drain: 6mA
- Voltage Gains from 20 to 200
- 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

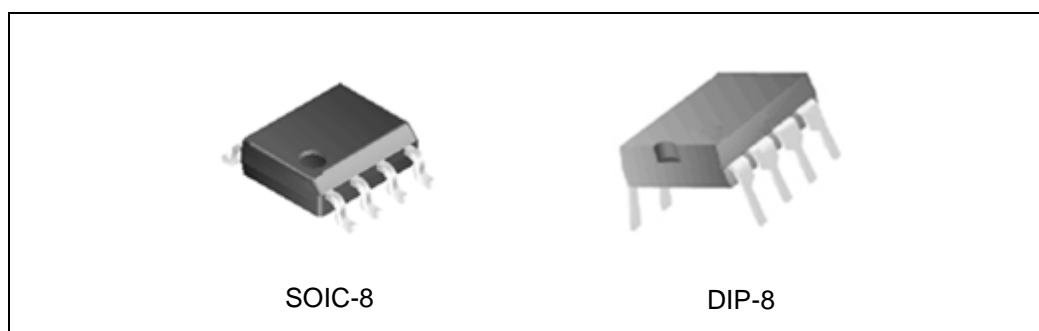


Figure 1. Package Types of AZ386



LOW VOLTAGE AUDIO POWER AMPLIFIER

AZ386

Pin Configuration

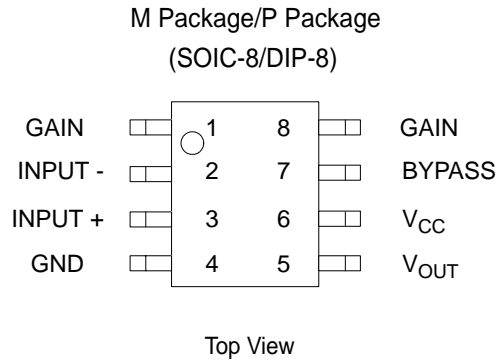


Figure 2. Pin Configuration of AZ386

Functional Block Diagram

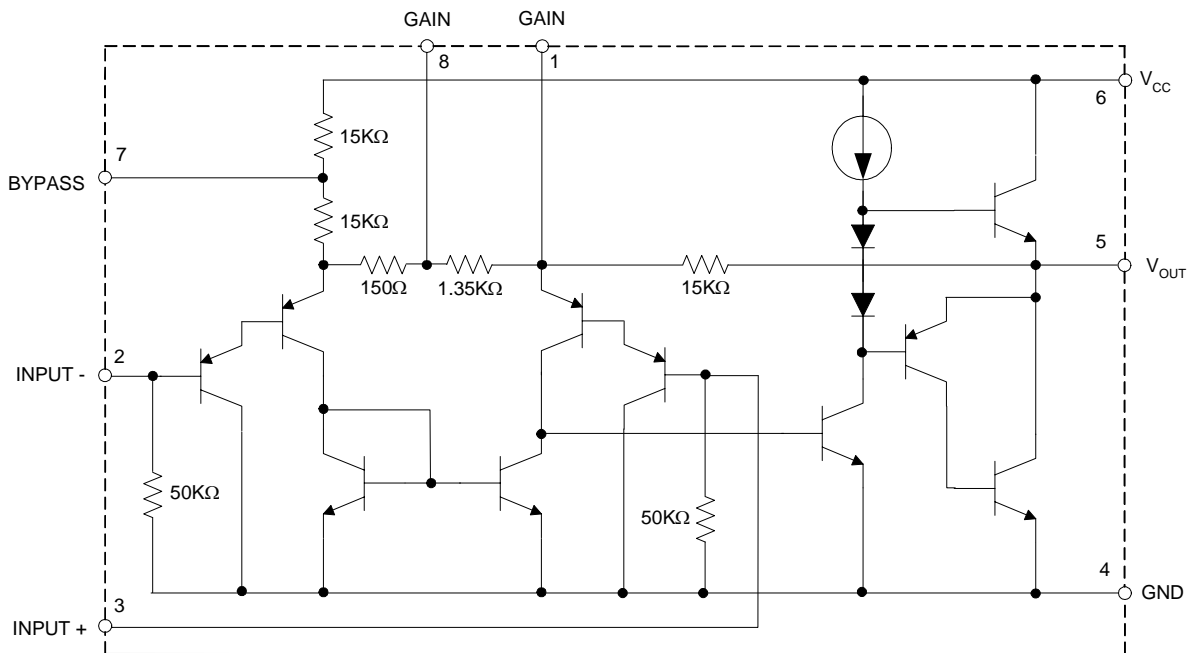
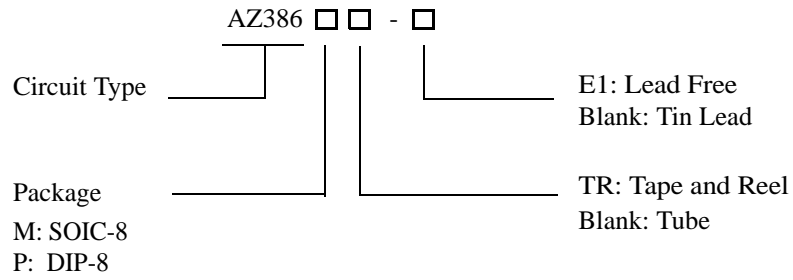


Figure 3. Functional Block Diagram of AZ386



LOW VOLTAGE AUDIO POWER AMPLIFIER **AZ386**

Ordering Information



| Package | Temperature Range | Part Number | | Marking ID | | Packing Type |
|---------|-------------------|-------------|-------------|------------|-----------|--------------|
| | | Tin Lead | Lead Free | Tin Lead | Lead Free | |
| SOIC-8 | 0 to 70°C | AZ386M | AZ386M-E1 | 386M | 386M-E1 | Tube |
| | | AZ386MTR | AZ386MTR-E1 | 386M | 386M-E1 | Tape & Reel |
| DIP-8 | 0 to 70°C | AZ386P | AZ386P-E1 | AZ386P | AZ386P-E1 | Tube |

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant.

**LOW VOLTAGE AUDIO POWER AMPLIFIER****AZ386****Absolute Maximum Ratings (Note 1)**

| Parameter | Symbol | Value | | Unit |
|------------------------------|---------------|------------------------------|------|------|
| Power Supply Voltage | V_{CC} | 18 | | V |
| Package Dissipation (Note 2) | P_D | AZ386P | 1.25 | W |
| | | AZ386M | 0.73 | W |
| Input Voltage | V_{IN} | -0.4 to 0.4 | | V |
| Junction Temperature | T_J | 150 | | °C |
| Storage Temperature Range | T_{STG} | -55 to 150 | | °C |
| Soldering Information | | DIP-8 Soldering (10 sec.) | 260 | °C |
| | | SOIC-8 (15 sec.) | 215 | |
| Thermal Resistance | θ_{JA} | DIP-8 | 107 | °C/W |
| | | SOIC-8 | 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 Operating 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 172°C/W for the small outline package.

Recommended Operating Conditions

| Parameter | Min | Max | Unit |
|-----------------------------|-----|-----|------|
| Operating Temperature Range | 0 | 70 | °C |

**LOW VOLTAGE AUDIO POWER AMPLIFIER****AZ386****Electrical Characteristics (Note 3)**Operating Conditions: $T_A=25^{\circ}\text{C}$ unless otherwise specified.

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|------------------------------|------------|--|-----|------|-----|------------------|
| Supply Voltage | V_{CC} | | 4 | | 16 | V |
| Quiescent Current | I_Q | $V_{CC}=6\text{V}$, $V_{IN}=0$ | | 6 | 8 | mA |
| Output Power | P_{OUT} | $V_{CC}=6\text{V}$, $R_L=8\Omega$, THD=10% | 250 | 300 | | mW |
| | | $V_{CC}=9\text{V}$, $R_L=8\Omega$, THD=10% | 500 | 800 | | mW |
| | | $V_{CC}=16\text{V}$, $R_L=32\Omega$, THD=10% | 700 | 1000 | | mW |
| Voltage Gain | G_V | $V_{CC}=6\text{V}$, $f=1\text{KHz}$ $10\mu\text{F}$ from Pin 1 to 8 | | 26 | | dB |
| | | | | | 45 | |
| Bandwidth | BW | $V_{CC}=6\text{V}$, Pins 1 and 8 open | | 500 | | KHz |
| Total Harmonic Distortion | THD | $V_{CC}=6\text{V}$, $R_L=8\Omega$, $P_{OUT}=125\text{mW}$ $f=1\text{KHz}$, Pins 1 and 8 open | | 0.27 | | % |
| Power Supply Rejection Ratio | PSRR | $V_{CC}=6\text{V}$, $f=1\text{KHz}$, $C_{BYPASS}=10\mu\text{F}$, Pins 1 and 8 open, Referred to Output | | 45 | | dB |
| Input Resistance | R_{IN} | | | 70 | | $\text{K}\Omega$ |
| Input Bias Current | I_{BIAS} | $V_{CC}=6\text{V}$, Pins 2 and 3 open | | 10 | | nA |

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



LOW VOLTAGE AUDIO POWER AMPLIFIER

AZ386

Typical Performance Characteristics

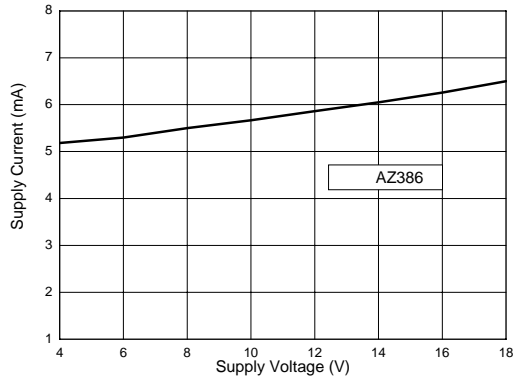


Figure 4. Quiescent Supply Current vs. Supply Voltage

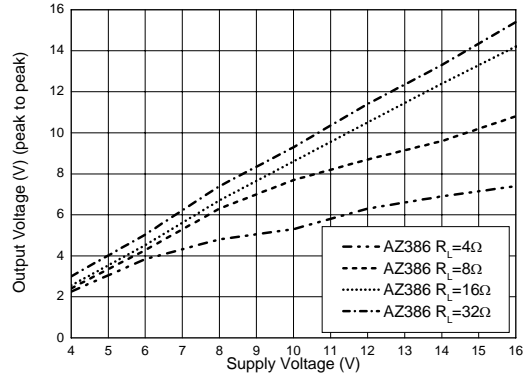


Figure 5. Peak-to-Peak Output Voltage Swing vs. Supply Voltage

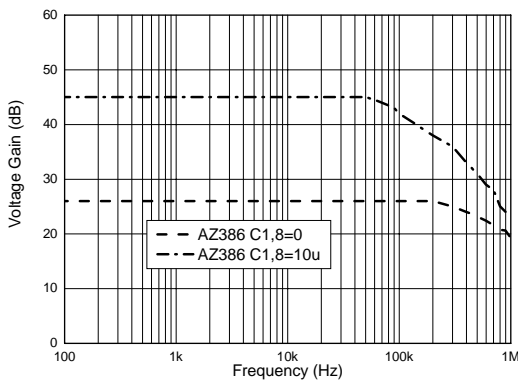


Figure 6. Voltage Gain vs. Frequency

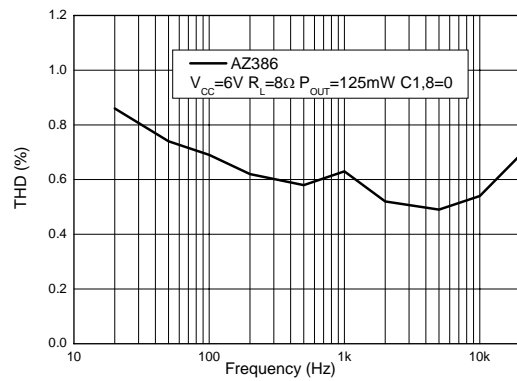


Figure 7. Distortion vs. Frequency

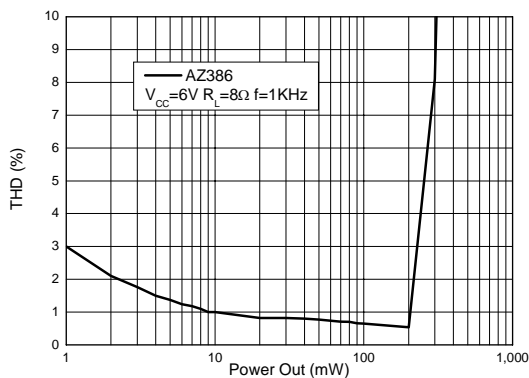


Figure 8. Distortion vs. Output Power

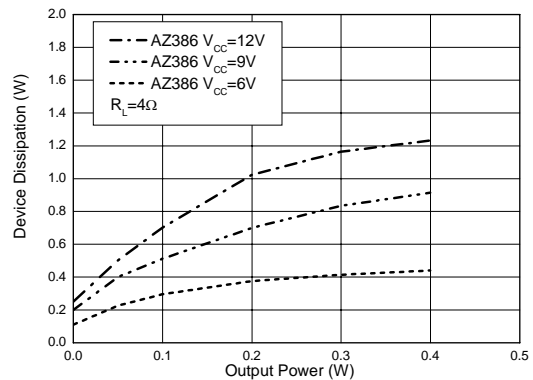


Figure 9. Device Dissipation vs. Output Power (4Ω Load)



LOW VOLTAGE AUDIO POWER AMPLIFIER

AZ386

Typical Performance Characteristics (Continued)

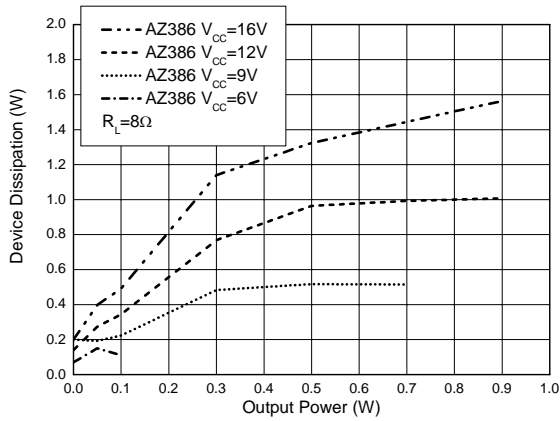


Figure 10. Device Dissipation vs. Output Power (8Ω Load)

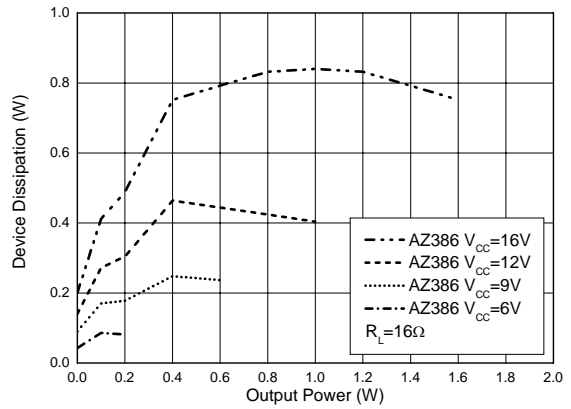


Figure 11. Device Dissipation vs. Output Power (16Ω Load)

Typical Applications (Note 4)

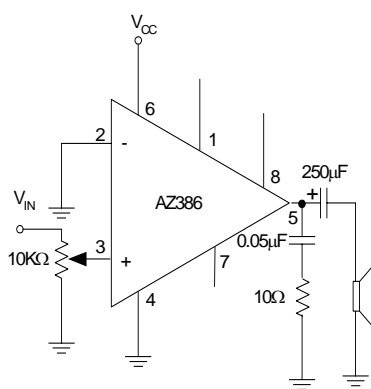


Figure 12. Amplifier With Gain=20

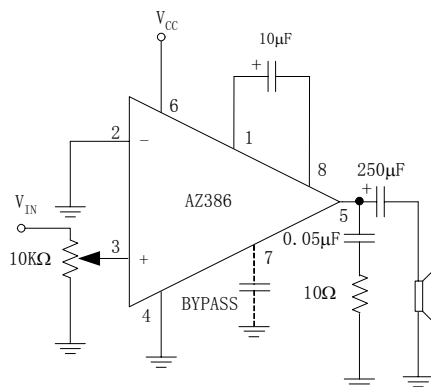


Figure 13. Amplifier With Gain=200



LOW VOLTAGE AUDIO POWER AMPLIFIER

AZ386

Typical Applications (Note 4) (Continued)

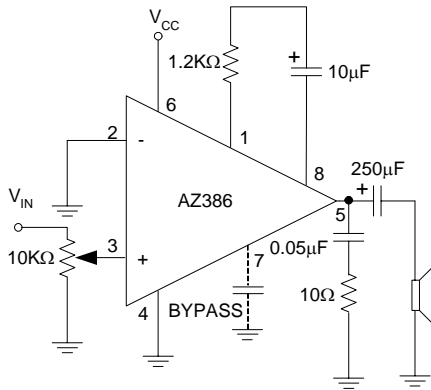


Figure 14. Amplifier With Gain=50

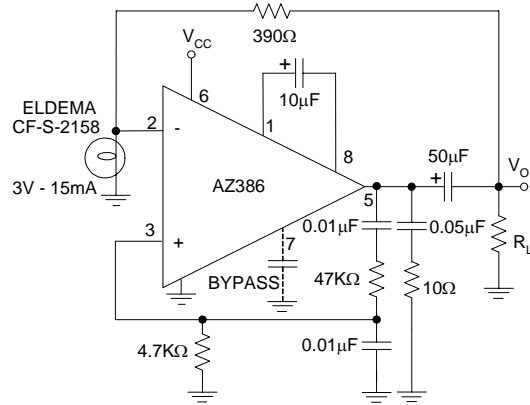


Figure 15. Low Distortion Power Wienbridge Oscillator

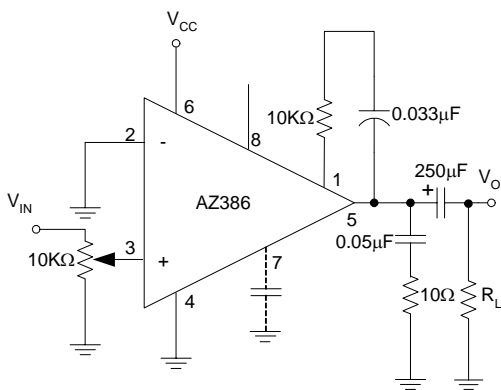


Figure 16. Amplifier With Bass Boost

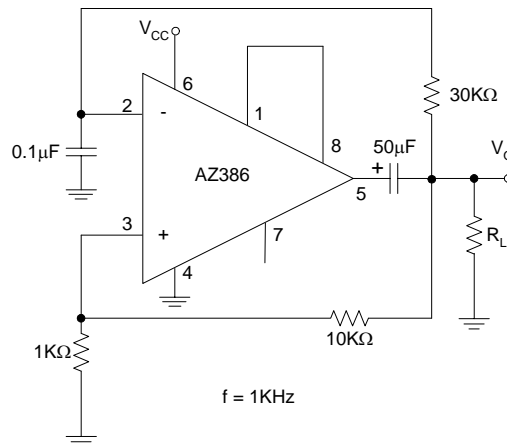


Figure 17. Square Wave Oscillator

Note 4: The R-C series circuit from output to ground, which will make the output stable, is depended on the different capacitive load in the circuit, the correct values for the R and C can be determined through experimental methods.



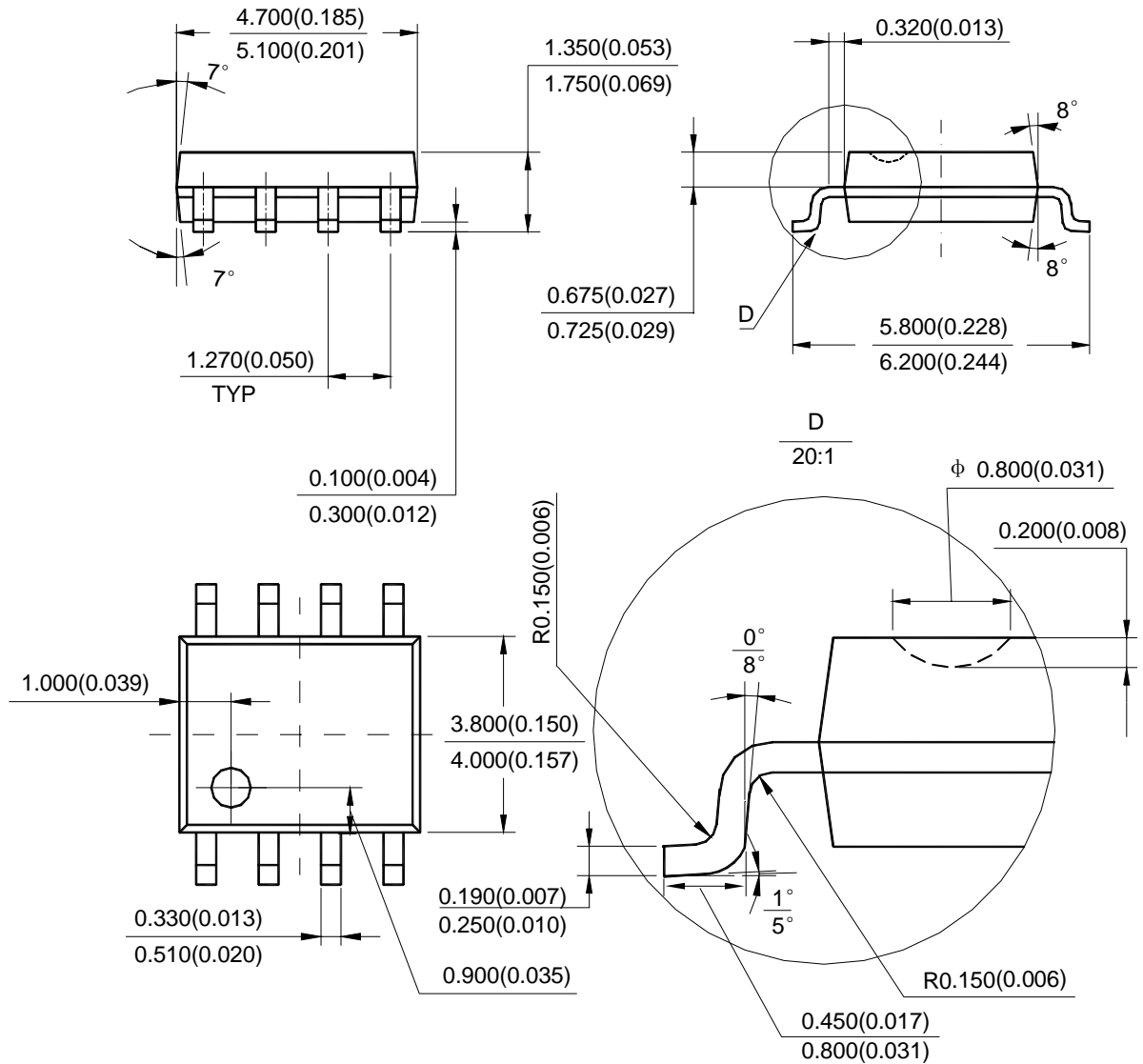
LOW VOLTAGE AUDIO POWER AMPLIFIER

AZ386

Mechanical Dimensions

SOIC-8

Unit: mm(inch)



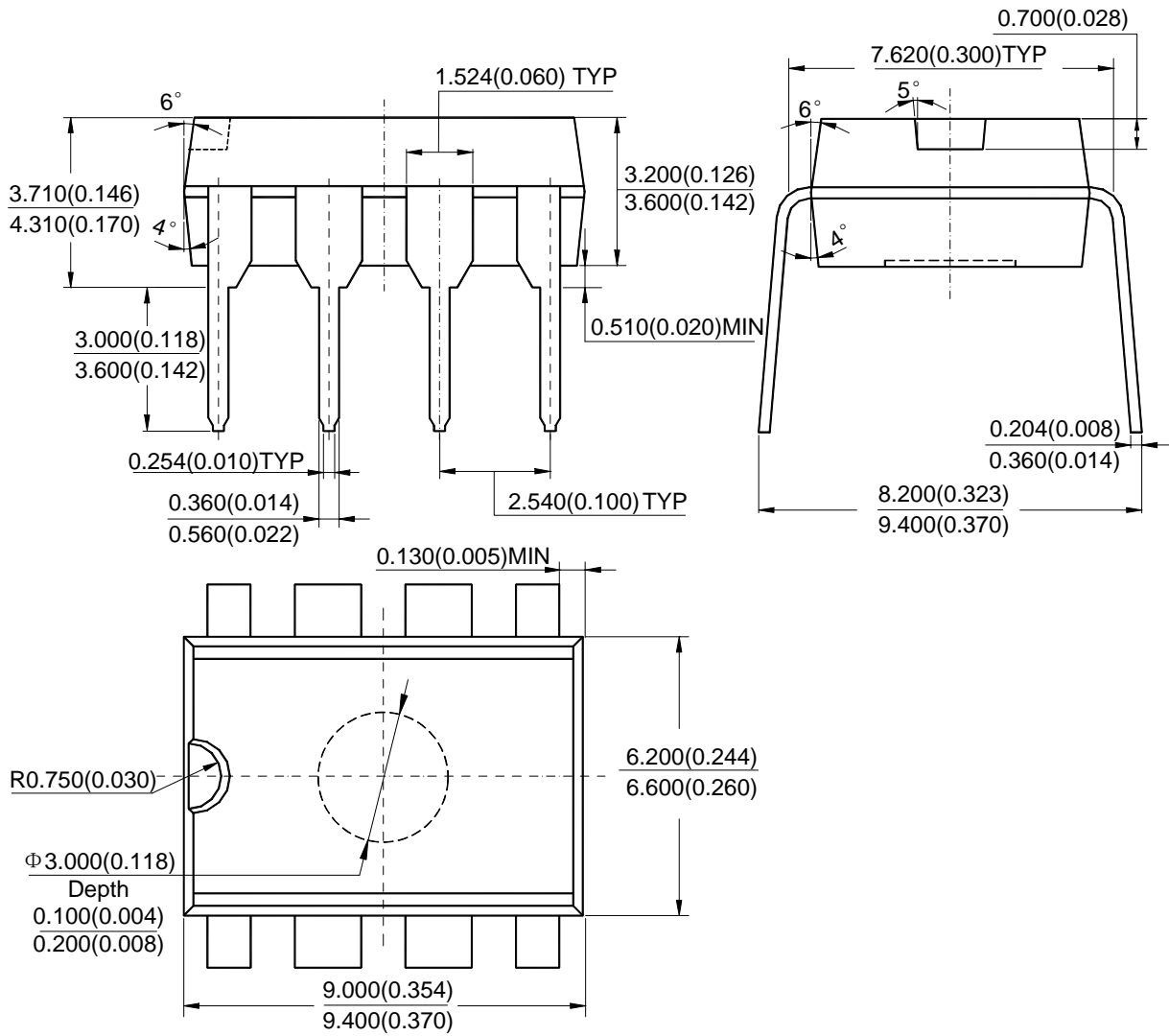


LOW VOLTAGE AUDIO POWER AMPLIFIER **AZ386**

Mechanical Dimensions (Continued)

DIP-8

Unit: mm(inch)





BCD Semiconductor Manufacturing Limited

<http://www.bcdsemi.com>

IMPORTANT NOTICE

BCD Semiconductor Manufacturing Limited reserves the right to make changes without further notice to any products or specifications herein. BCD Semiconductor Manufacturing Limited does not assume any responsibility for use of any its products for any particular purpose, nor does BCD Semiconductor Manufacturing Limited assume any liability arising out of the application or use of any its products or circuits. BCD Semiconductor Manufacturing Limited does not convey any license under its patent rights or other rights nor the rights of others.

MAIN SITE

BCD Semiconductor Manufacturing Limited
- Wafer Fab
Shanghai SIM-BCD Semiconductor Manufacturing Limited
800, Yi Shan Road, Shanghai 200233, China
Tel: +86-21-6485 1491, Fax: +86-21-5450 0008

BCD Semiconductor Manufacturing Limited
- IC Design Group
Advanced Analog Circuits (Shanghai) Corporation
8F, Zone B, 900, Yi Shan Road, Shanghai 200233, China
Tel: +86-21-6495 9539, Fax: +86-21-6485 9673

REGIONAL SALES OFFICE



Shenzhen Office
Shanghai SIM-BCD Semiconductor Manufacturing Co., Ltd. Shenzhen Office
Advanced Analog Circuits (Shanghai) Corporation Shenzhen Office
Room E, 5F, Noble Center, No.1006, 3rd Fuzhong Road, Futian District, Shenzhen 518026, China
Tel: +86-755-8826 7951
Fax: +86-755-8826 7865

Taiwan Office
BCD Semiconductor (Taiwan) Company Limited
4F, 298-1, Rui Guang Road, Nei-Hu District, Taipei, Taiwan
Tel: +886-2-2656 2808
Fax: +886-2-2656 2806

USA Office
BCD Semiconductor Corporation
30920 Huntwood Ave. Hayward, CA 94544, U.S.A
Tel : +1-510-324-2988
Fax: +1-510-324-2788

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View AZ386P-E1 on WIN SOURCE](#)
-  [Diodes Incorporated Information](#)

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management