

**DUAL BIPOLAR OPERATIONAL AMPLIFIERS****AZ4558C****General Description**

The AZ4558C consists of two high performance operational amplifiers. The IC features high gain, low equivalent input noise voltage, high input resistance, excellent channel separation, wide range of operating voltage and internal frequency compensation.

It can work with  $\pm 18V$  maximum power supply voltage or single power supply up to 36V.

The AZ4558C is available in DIP-8 and SOIC-8 packages.

**Features**

- Internally Frequency Compensated
- Large Signal Voltage Gain: 100dB Typical
- Gain and Phase Match between Amplifiers
- Gain Bandwidth Product (at 10kHz): 5.5MHz
- Pin to Pin Compatible with MC1458

**Applications**

- Audio AC-3 Decoder System
- Audio Amplifier

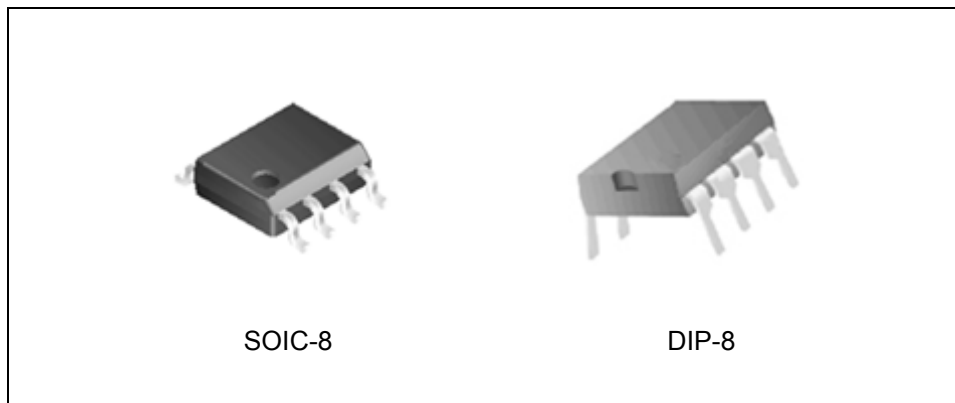


Figure 1. Package Types of AZ4558C

**DUAL BIPOLAR OPERATIONAL AMPLIFIERS**

**AZ4558C**

**Pin Configuration**

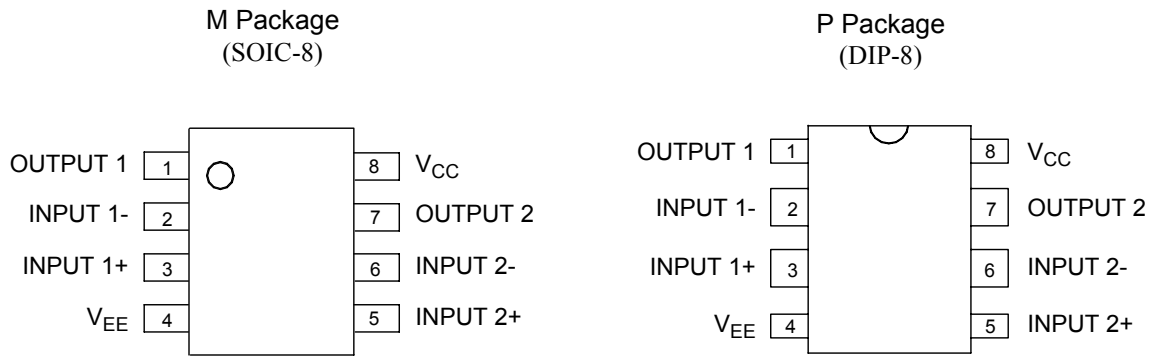


Figure 2. Pin Configuration of AZ4558C (Top View)

**Functional Block Diagram**

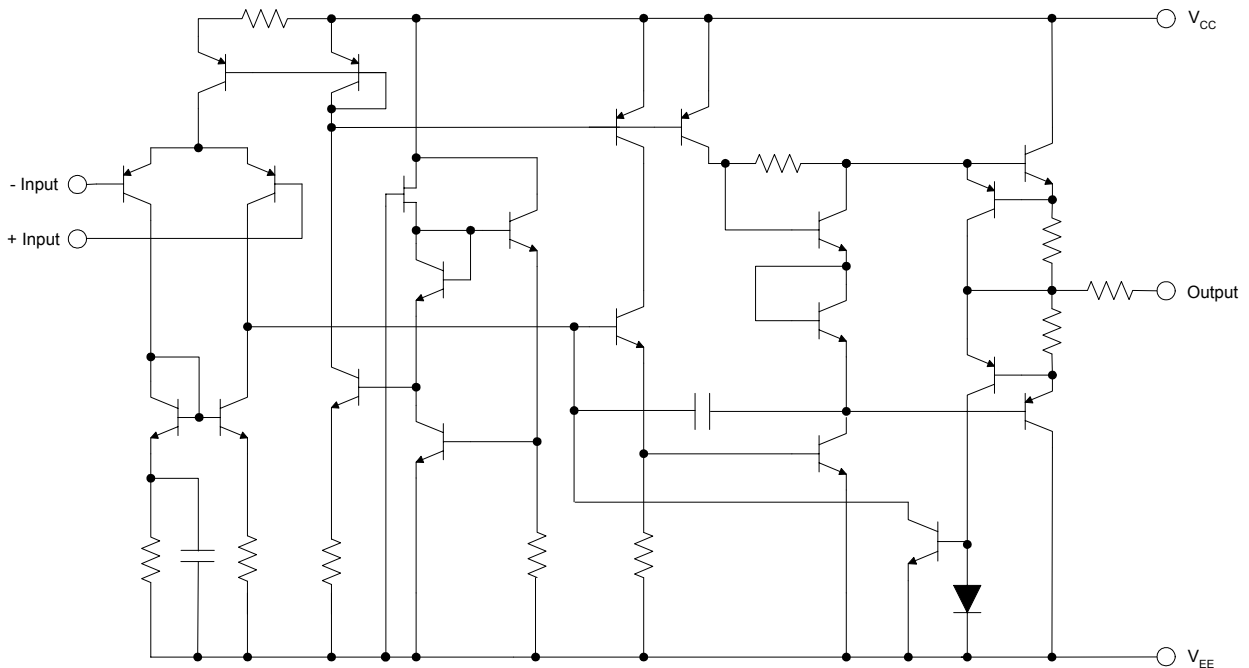


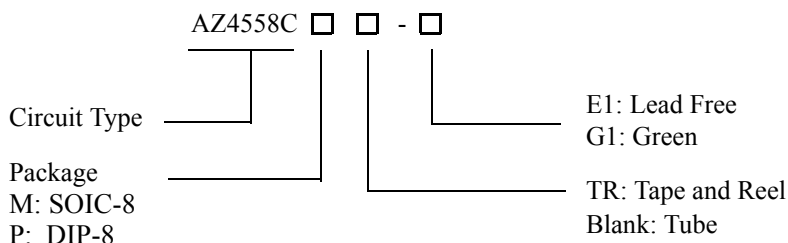
Figure 3. Functional Block Diagram of AZ4558C (Each Amplifier)



**DUAL BIPOLAR OPERATIONAL AMPLIFIERS**

**AZ4558C**

**Ordering Information**



Package	Temperature Range	Part Number		Marking ID		Packing Type
		Lead Free	Green	Lead Free	Green	
SOIC-8	-40 to 85°C	AZ4558CM-E1	AZ4558CM-G1	4558CM-E1	4558CM-G1	Tube
		AZ4558CMTR-E1	AZ4558CMTR-G1	4558CM-E1	4558CM-G1	Tape & Reel
DIP-8	-40 to 85°C	AZ4558CP-E1	AZ4558CP-G1	AZ4558CP-E1	AZ4558CP-G1	Tube

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant. Products with "G1" suffix are available in green packages.

**Absolute Maximum Ratings (Note 1)**

Parameter	Symbol	Value	Unit
Supply Voltage	$V_{CC}$	+20	V
	$V_{EE}$	-20	
Input Voltage	$V_I$	±15	V
Differential Input Voltage	$V_{ID}$	±30	V
Operating Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{STG}$	-65 to 150	°C
Lead Temperature (Soldering 10s)	$T_L$	260	°C
Power Dissipation	$P_D$	DIP	800 mW
		SOIC	500 mW

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.

**Recommended Operating Conditions**

Parameter	Min	Max	Unit
Supply Voltage	±2	±18	V
Operating Temperature Range	-40	85	°C



**DUAL BIPOLAR OPERATIONAL AMPLIFIERS**

**AZ4558C**

**Electrical Characteristics**

Operating Conditions:  $V_{CC}=+15V$ ,  $V_{EE}=-15V$ ,  $T_A=25^{\circ}C$ , unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input Offset Voltage	$V_{IO}$			1	5	mV
Input Offset Current	$I_{IO}$	$V_{CM}=0V$		10	100	nA
Input Bias Current	$I_{IB}$	$V_{CM}=0V$		70	400	nA
Large Signal Voltage Gain	$A_{VD}$	$R_L=2K\Omega$ , $V_O=\pm 10V$	85	100		dB
Supply Voltage Rejection Ratio	SVR	$R_S \leq 10K\Omega$	80	100		dB
Supply Current	$I_{CC}$	All Amplifiers, No Load		2.5	4.5	mA
Input Common Mode Voltage Range	$V_{ICM}$		$\pm 12$			V
Common Mode Rejection Ratio	CMRR	$R_S \leq 10K\Omega$	70	95		dB
Output Voltage Swing	$V_O$	$R_L \geq 10K\Omega$	$\pm 12$	$\pm 14$		V
		$R_L \geq 2K\Omega$	$\pm 10$	$\pm 13$		
Slew Rate	SR	$V_I = \pm 10V$ , $R_L = 2K\Omega$ , $C_L = 100pF$ , unity gain		1.8		V/ $\mu s$
Rise Time	$T_R$	$V_I = \pm 20mV$ , $R_L = 2K\Omega$ , $C_L = 100pF$ , unity gain		0.3		$\mu s$
Overshoot	$K_{OV}$	$V_I = \pm 20mV$ , $R_L = 2K\Omega$ , $C_L = 100pF$ , unity gain		15		%
Input Resistance	$R_I$			0.5		$M\Omega$
Output Resistance	$R_O$			45		$\Omega$
Unity Gain Bandwidth	B	Gain=0dB		2.8		MHz
Gain Bandwidth Product	GBWP	$V_I = \pm 10mV$ , $R_L = 2K\Omega$ , $C_L = 100pF$ , $f = 10KHz$		5.5		MHz
Total Harmonic Distortion Plus Noise	THD+N	$f = 1KHz$ , $A_V = 6dB$ , $R_L = 10K\Omega$ , $V_O = 1V_{RMS}$		0.002		%
Equivalent Input Noise Voltage Density	$e_N$	$R_S = 100\Omega$ , $f = 1KHz$		10		$\frac{nV}{\sqrt{Hz}}$
Output Current	$I_{SINK}$	$V_- = 1V$ , $V_+ = 0V$ , $V_O = 2V$		60		mA
	$I_{SOURCE}$	$V_+ = 1V$ , $V_- = 0V$ , $V_O = 2V$		35		
Thermal Resistance (Junction to Case)	$\theta_{JC}$	DIP-8		55		$^{\circ}C/W$
		SOIC-8		81		



Typical Performance Characteristics

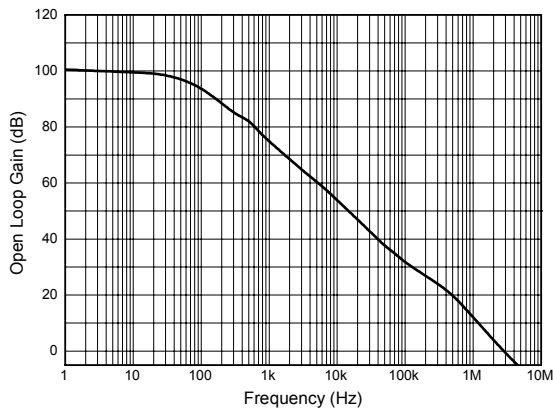


Figure 4. Open Loop Voltage Gain vs. Frequency

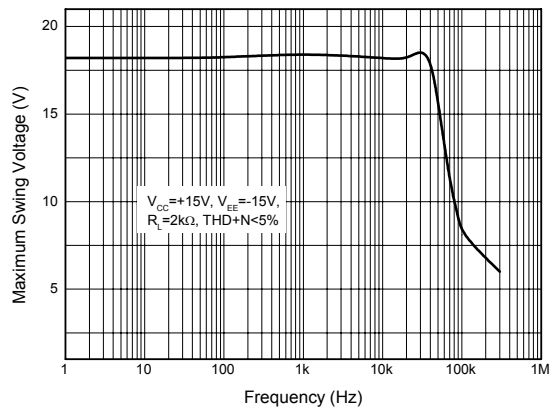


Figure 5. Maximum Output Voltage Swing vs. Frequency

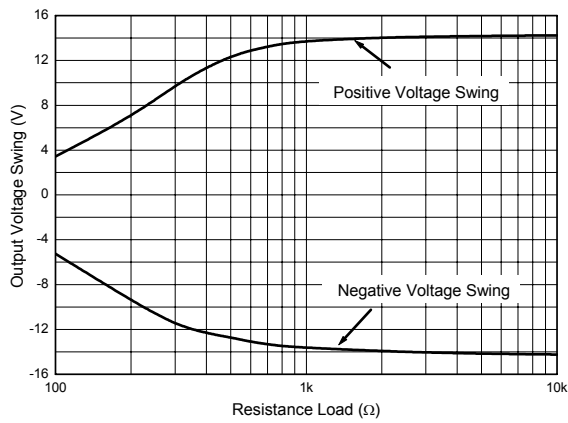


Figure 6. Maximum Output Voltage Swing vs. Load Resistance

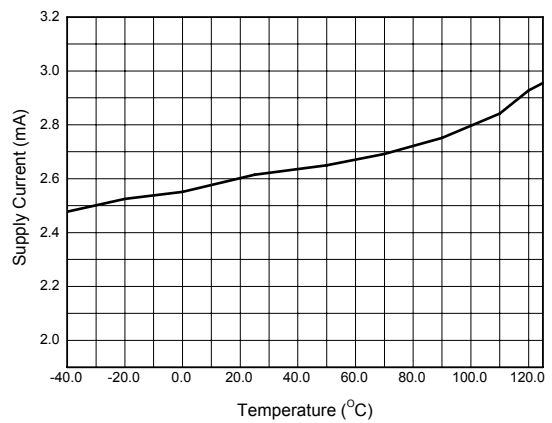


Figure 7. Supply Current vs. Temperature



Typical Performance Characteristics (Continued)

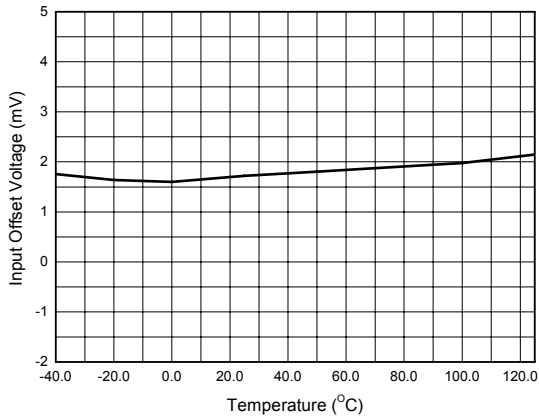


Figure 8. Input Offset Voltage vs. Temperature

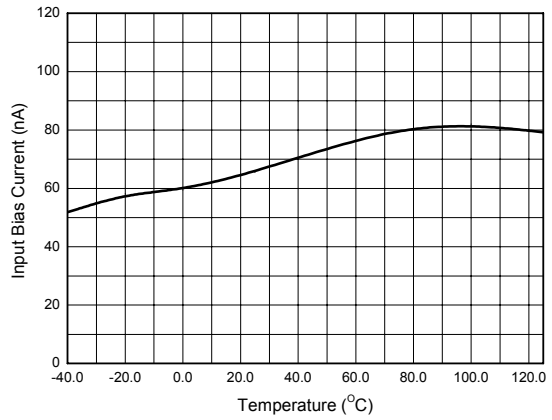


Figure 9. Input Bias Current vs. Temperature

**Typical Application**

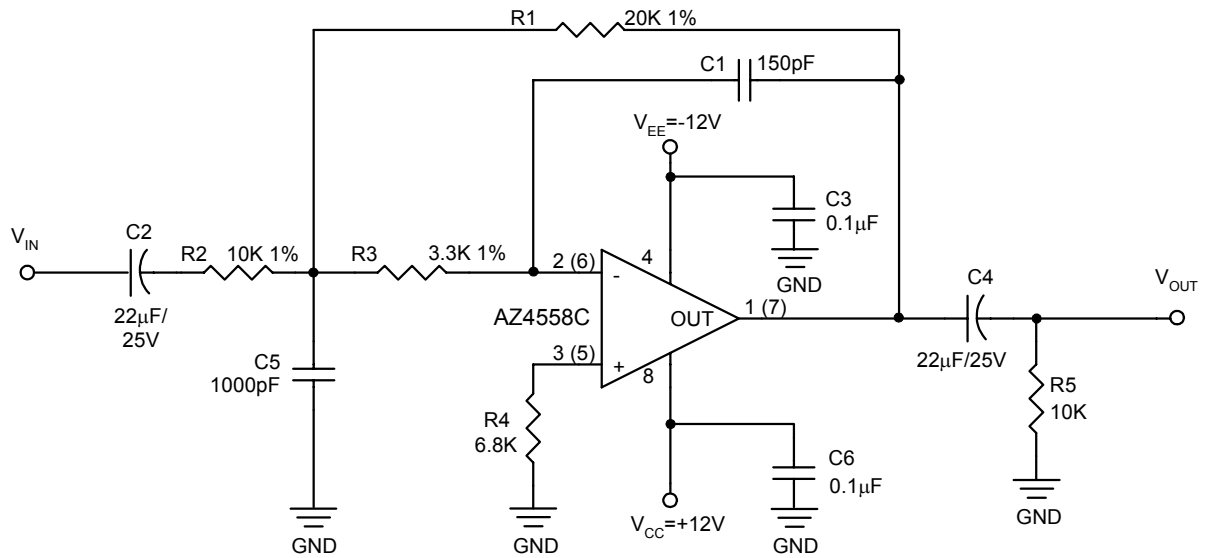


Figure 10. Typical Application of AZ4558C in Audio 2nd Order Low Pass Filter  
 ( $f_O=50.6\text{kHz}$ ,  $Q=0.7015$ , Input impedance=10K, Gain=6dB, Group delay=4.48µs)



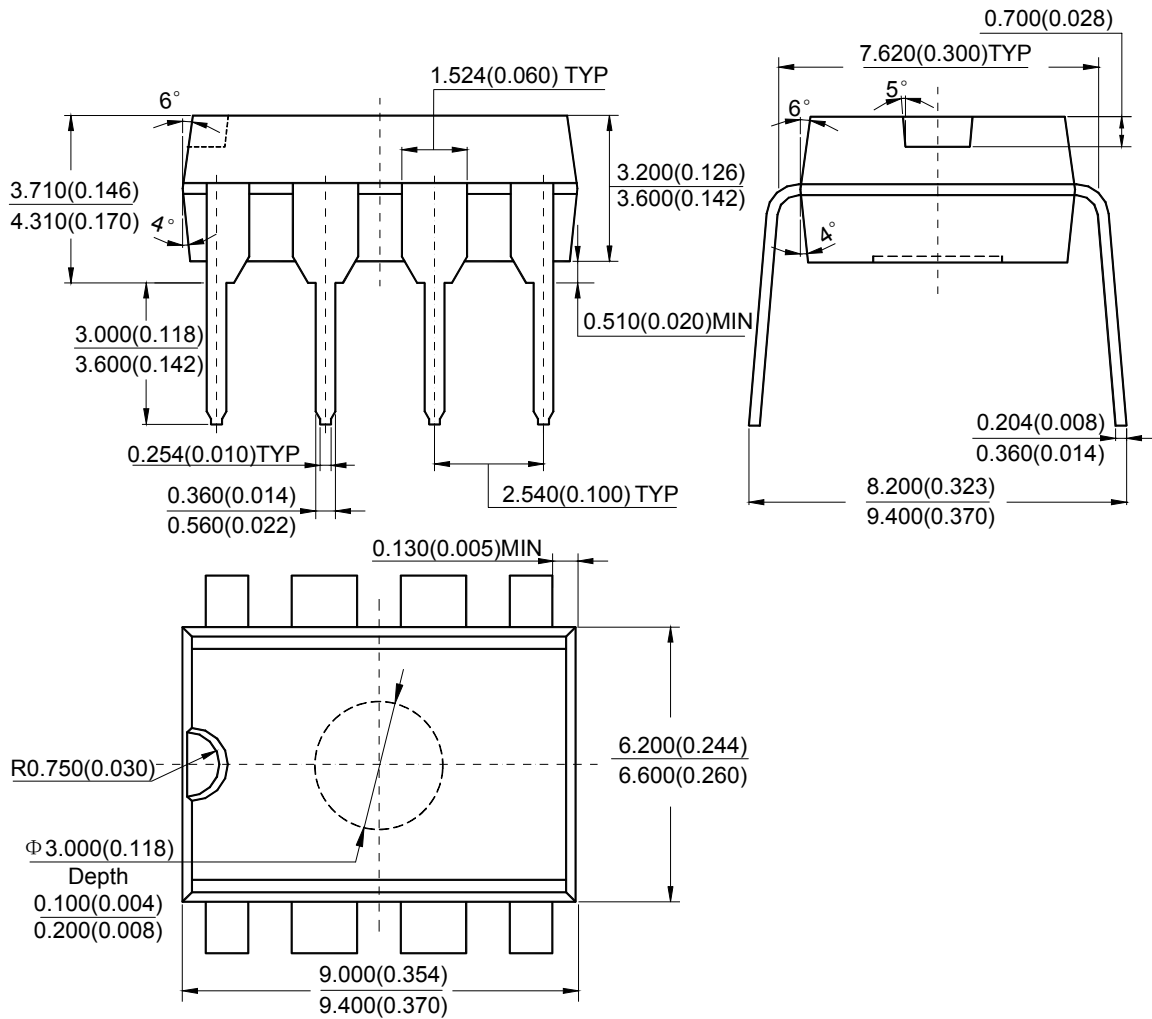
DUAL BIPOLAR OPERATIONAL AMPLIFIERS

AZ4558C

Mechanical Dimensions

DIP-8

Unit: mm(inch)



Note: Eject hole, oriented hole and mold mark is optional.





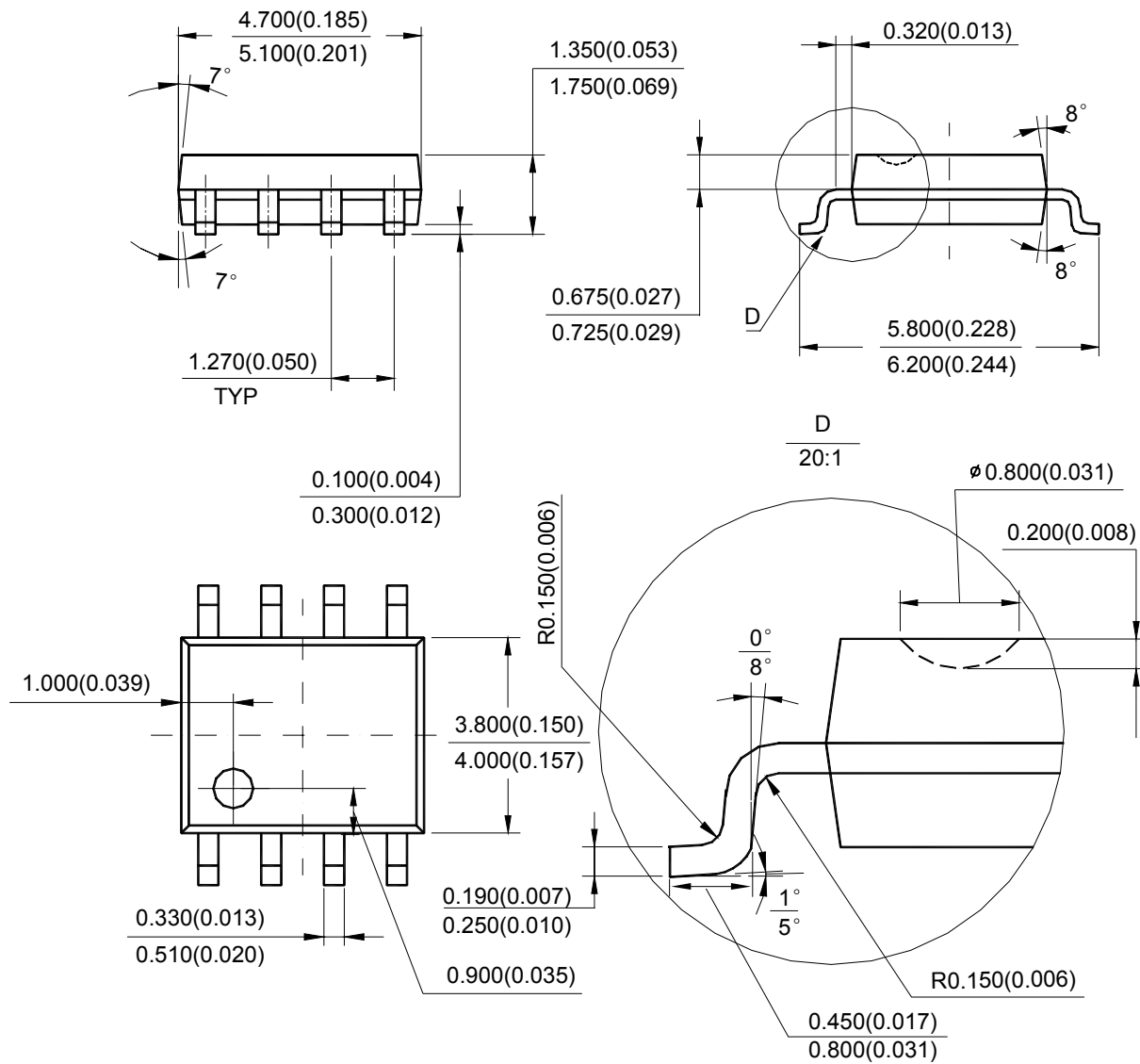
DUAL BIPOLAR OPERATIONAL AMPLIFIERS

AZ4558C

Mechanical Dimensions (Continued)

SOIC-8

Unit: mm(inch)



Note: Eject hole, oriented hole and mold mark is optional.



## 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

##### - Headquarters

##### BCD Semiconductor Manufacturing Limited

No. 1600, Zi Xing Road, Shanghai Zizhu Science-based Industrial Park, 200241, China  
Tel: +86-21-24162266, Fax: +86-21-24162277

##### - Wafer Fab

##### Shanghai SIM-BCD Semiconductor Manufacturing Co., Ltd.

800 Yi Shan Road, Shanghai 200233, China  
Tel: +86-21-6485 1491, Fax: +86-21-5450 0008

#### REGIONAL SALES OFFICE

##### Shenzhen Office

##### Shanghai SIM-BCD Semiconductor Manufacturing Co., Ltd., Shenzhen Office

Unit A Room 1203, Skyworth Bldg., Gaoxin Ave. 1.S., Nanshan District, Shenzhen, 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 Corp.

30920 Huntwood Ave. Hayward, CA 94544, USA  
Tel : +1-510-324-2988  
Fax: +1-510-324-2788