

**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

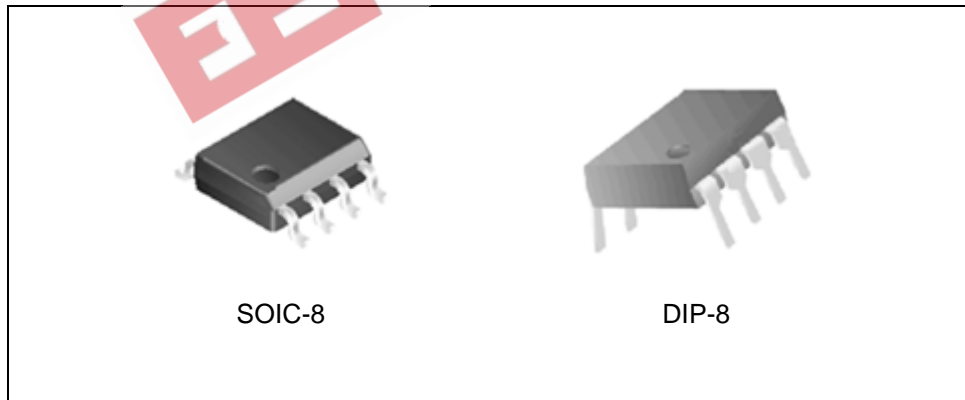


Figure 1. Package Types of AZ4558C



**DUAL BIPOLAR OPERATIONAL AMPLIFIERS**

**AZ4558C**

**Pin Configuration**

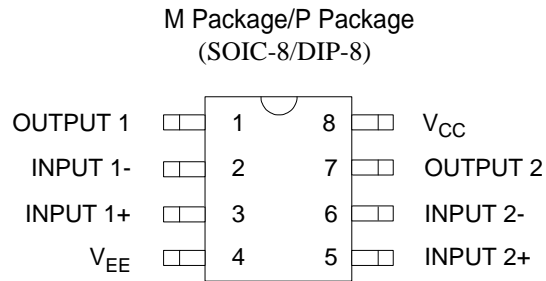


Figure 2. Pin Configuration of AZ4558C (Top View)

**Functional Block Diagram**

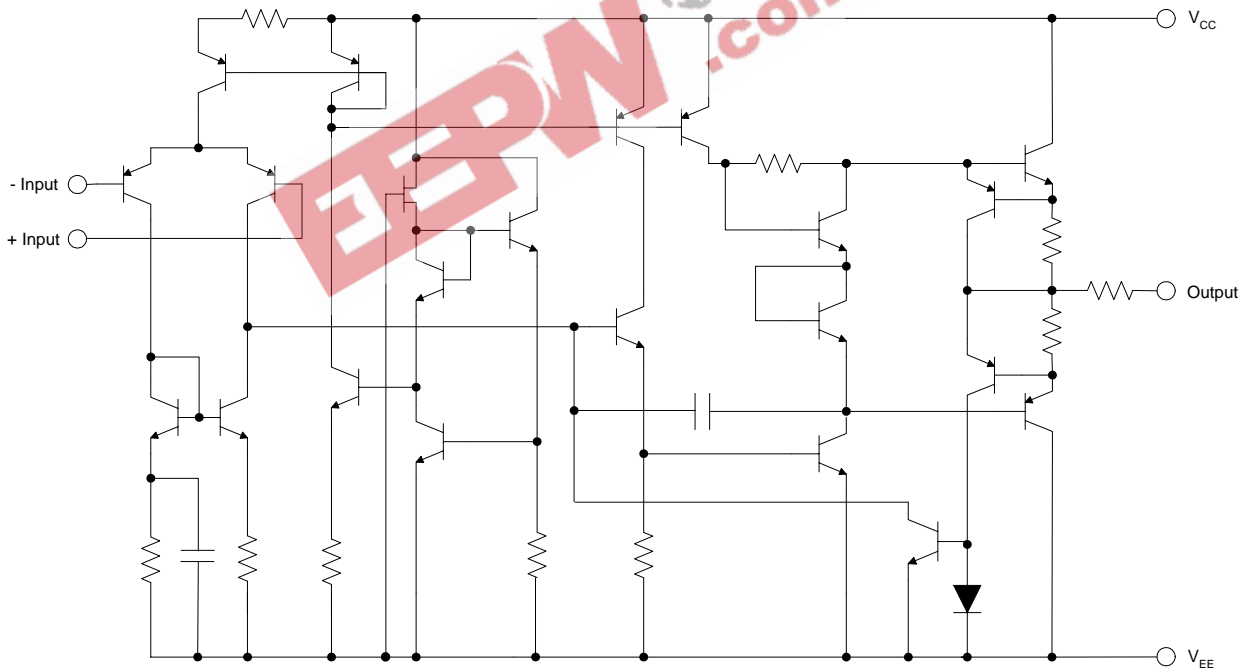


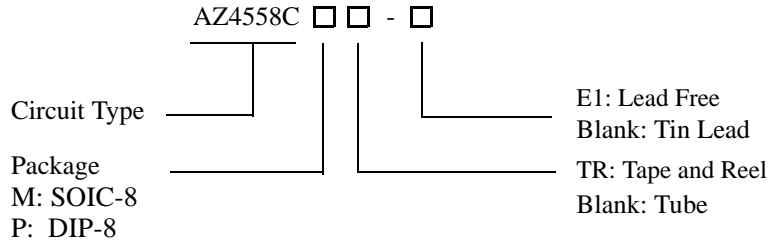
Figure 3. Functional Block Diagram of AZ4558C (Each Amplifier)



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**AZ4558C**

**Ordering Information**



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

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

**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



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**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		



**DUAL BIPOLAR OPERATIONAL AMPLIFIERS**

**AZ4558C**

**Typical Performance Characteristics**

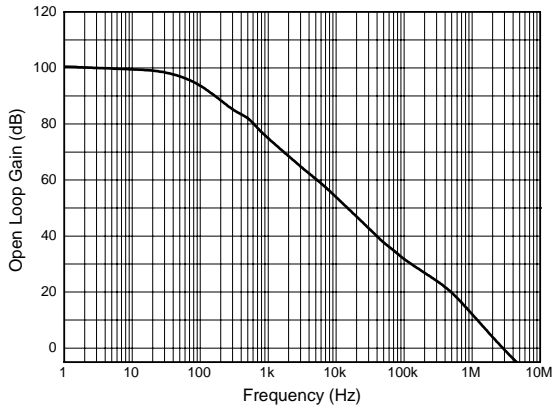


Figure 4. Open Loop Voltage Gain vs. Frequency

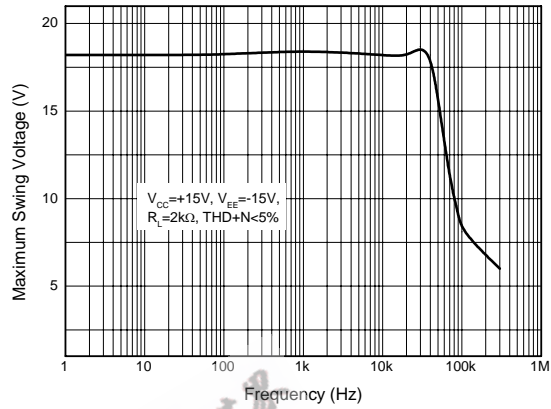


Figure 5. Maximum Output Voltage Swing vs. Frequency

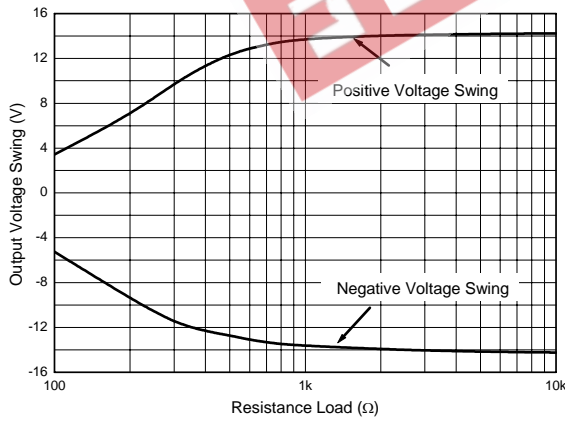


Figure 6. Maximum Output Voltage Swing vs. Load Resistance

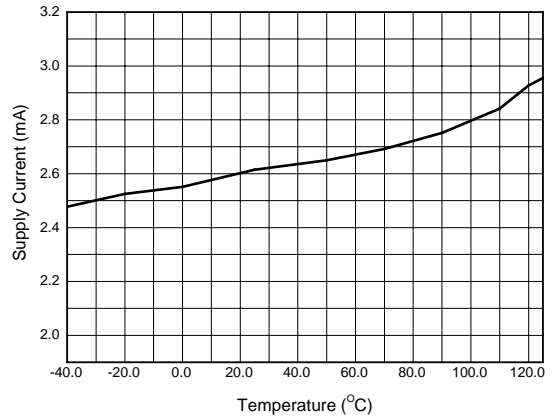


Figure 7. Supply Current vs. Temperature



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**Typical Performance Characteristics (Continued)**

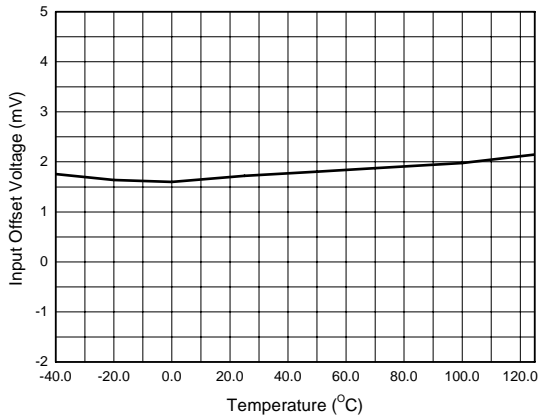


Figure 8. Input Offset Voltage vs. Temperature

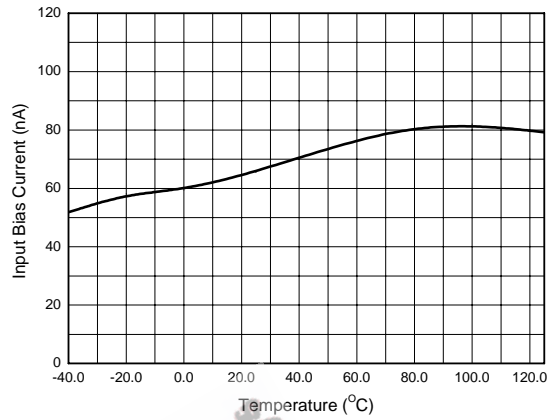


Figure 9. Input Bias Current vs. Temperature

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**Typical Application**

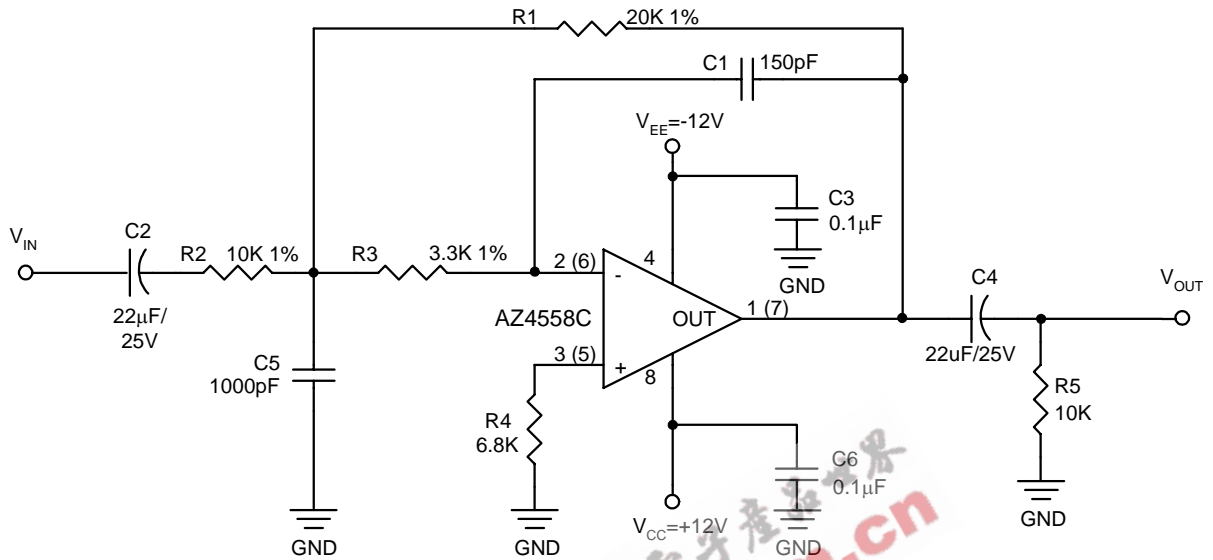


Figure 10. Typical Application of AZ4558C in Audio 2nd Order Low Pass Filter  
( $f_o=50.6\text{kHz}$ ,  $Q=0.7015$ , Input impedance=10K, Gain=6dB, Group delay=4.48µs)



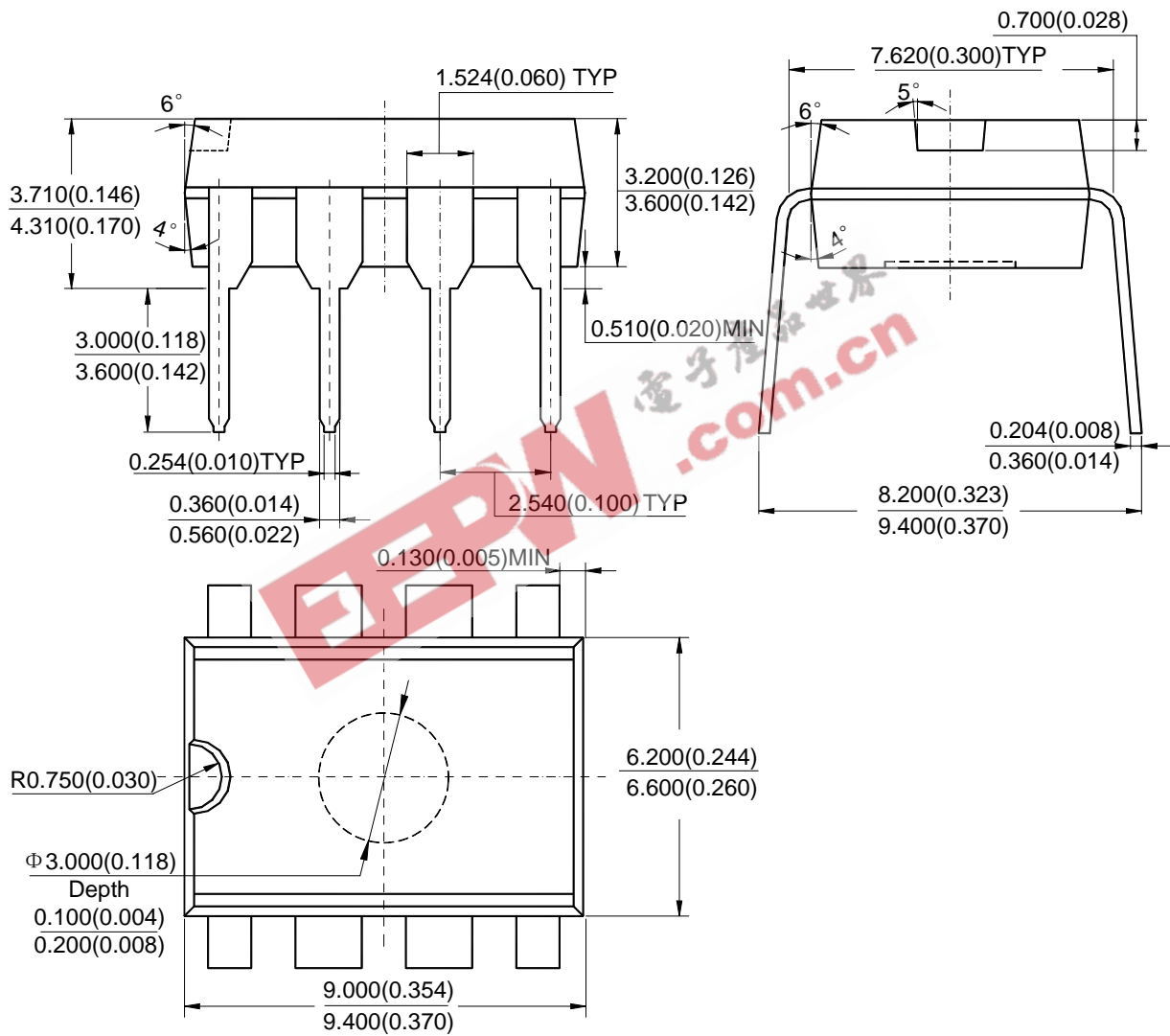
**DUAL BIPOLAR OPERATIONAL AMPLIFIERS**

**AZ4558C**

**Mechanical Dimensions**

**DIP-8**

**Unit: mm(inch)**







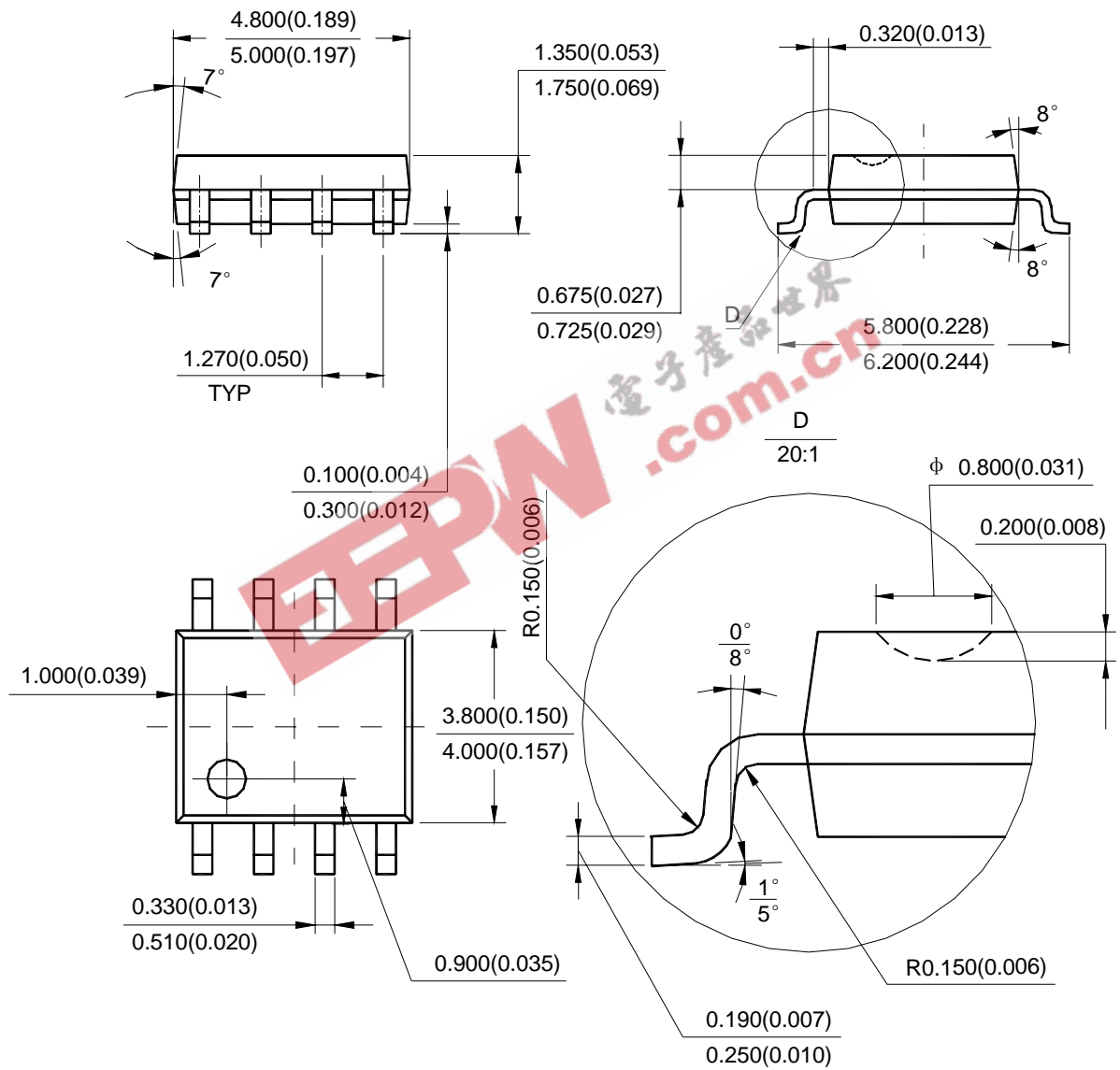
**DUAL BIPOLAR OPERATIONAL AMPLIFIERS**

**AZ4558C**

**Mechanical Dimensions (Continued)**

**SOIC-8**

**Unit: mm(inch)**





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