

**DUAL OPERATIONAL AMPLIFIERS****AZ4558****General Description**

The AZ4558 consists of two high performance operational amplifiers. The IC features high gain, 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.

The AZ4558 is specifically suitable for applications in differential-in, differential-out as well as in potential-metric amplifiers and where gain and phase matched channels are mandatory.

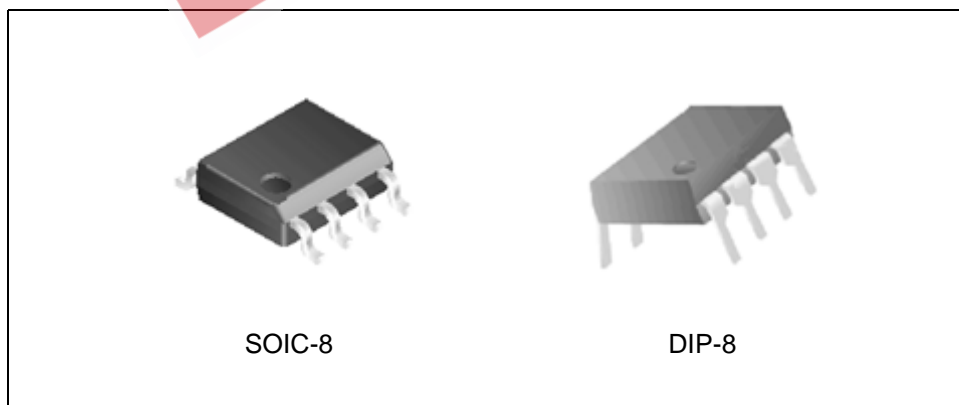
The AZ4558 is available in DIP-8 and SOIC-8 package.

**Features**

- Internal Frequency Compensation
- Large Signal Voltage Gain with 100 dB Typical
- High Input Resistance with  $5M\Omega$  Typical
- Maximum Power Supply Voltages:  $\pm 18V$
- Compatible with NJM 4558
- Low Input Voltage Noise with  $10nV/\sqrt{Hz}$  at 1KHz

**Applications**

- Audio AC-3 Decoder System
- Audio Amplifier

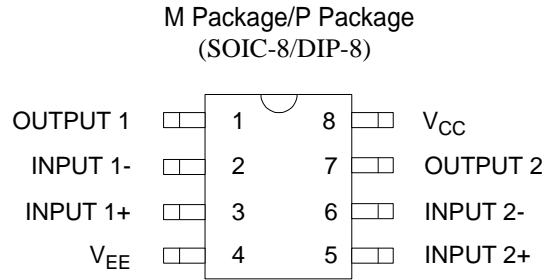




**DUAL OPERATIONAL AMPLIFIERS**

**AZ4558**

**Pin Configuration**



Top View

Figure 2. Pin Configuration of AZ4558

**Functional Block Diagram**

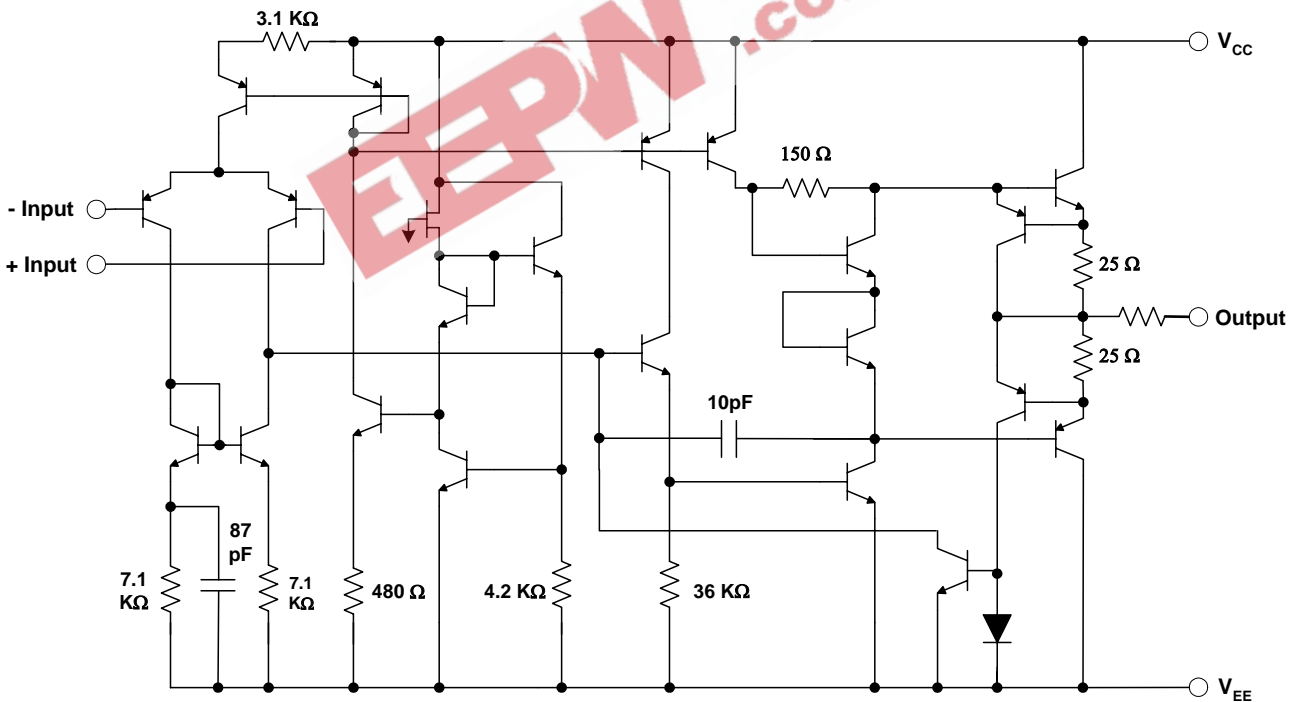


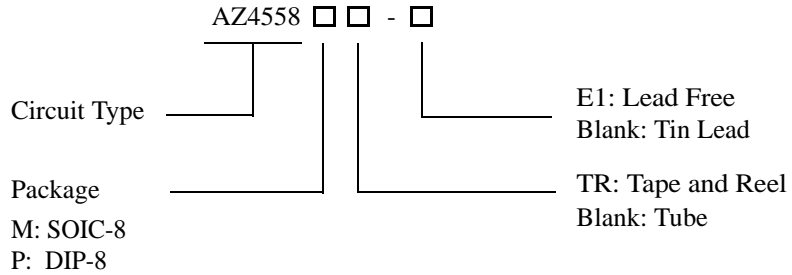
Figure 3. Representative Schematic Diagram of AZ4558 (Each Amplifier)



**DUAL OPERATIONAL AMPLIFIERS**

**AZ4558**

**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	AZ4558M	AZ4558M-E1	4558M	4558M-E1	Tube
		AZ4558MTR	AZ4558MTR-E1	4558M	4558M-E1	Tape & Reel
DIP-8	-40 to 85°C	AZ4558P	AZ4558P-E1	AZ4558P	AZ4558P-E1	Tube

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

**DUAL OPERATIONAL AMPLIFIERS****AZ4558****Absolute Maximum Ratings (Note 1)**

Parameter	Symbol	Value		Unit
Power Supply Voltage	$V_{CC}$	+20		V
	$V_{EE}$	-20		
Input Voltage	$V_I$	$\pm 15$		V
Differential Input Voltage	$V_{ID}$	$\pm 30$		V
Operating Junction Temperature	$T_J$	150		$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-65 to 150		$^{\circ}\text{C}$
Lead Temperature (Soldering 10s)	$T_L$	260		$^{\circ}\text{C}$
Power Dissipation	$P_D$	DIP-8	800	mW
		SOIC-8	500	

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	$\pm 4$	$\pm 18$	V
Operating Temperature Range	-40	85	$^{\circ}\text{C}$



**DUAL OPERATIONAL AMPLIFIERS**

**AZ4558**

**Electrical Characteristics**

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

Parameter	Conditions	Min	Typ	Max	Unit
Input Offset Voltage			0.5	6	mV
Input Bias Current	$V_{CM}=0V$		25	250	nA
Input Offset Current	$V_{CM}=0V$		2.5	100	nA
Input Resistance		0.3	5		MΩ
Supply Current	$R_L=\infty$ , Over full temperature range		3.3	5.7	mA
Large Signal Voltage Gain	$R_L \geq 2K$ , $V_O = \pm 10V$	85	100		dB
Common Mode Rejection Ratio	$R_S \leq 10k\Omega$	80	92		dB
Power Supply Rejection Ratio	$R_S \leq 10k\Omega$	80	95		dB
Output Current	Source $V_+=1V, V_-=0V, V_O=2V$		50		mA
	Sink $V_+=0V, V_-=1V, V_O=2V$		50		mA
Output Voltage Swing	$R_L \geq 2K\Omega$	$\pm 10$	$\pm 13$		V
	$R_L \geq 10K\Omega$	$\pm 12$	$\pm 14$		
Slew Rate	$R_L=2K\Omega, C_L=100pF$		1.3		V/ $\mu$ S
Equivalent Input Noise Voltage Density	$R_S=50\Omega, f=1KHz$		10		nV/ $\sqrt{Hz}$
Gain Bandwidth Product	$R_L=2K\Omega, f=10KHz$		3.4		MHz



DUAL OPERATIONAL AMPLIFIERS

AZ4558

Typical Performance Characteristics

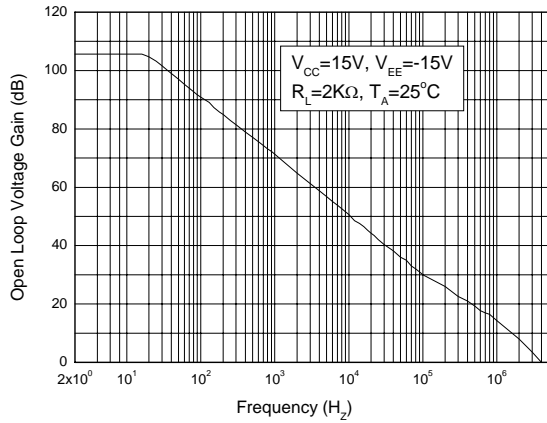


Figure 4. Open Loop Voltage Gain vs. Frequency

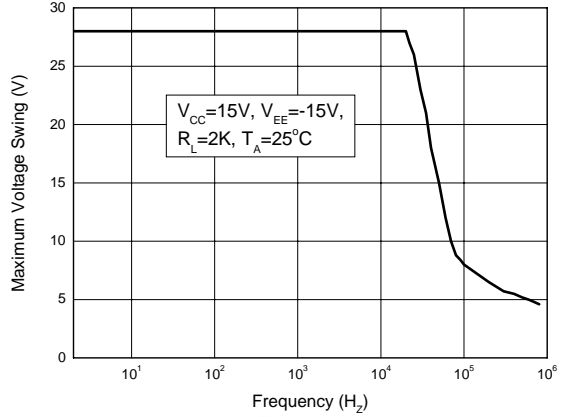


Figure 5. Maximum Output Voltage Swing vs. Frequency

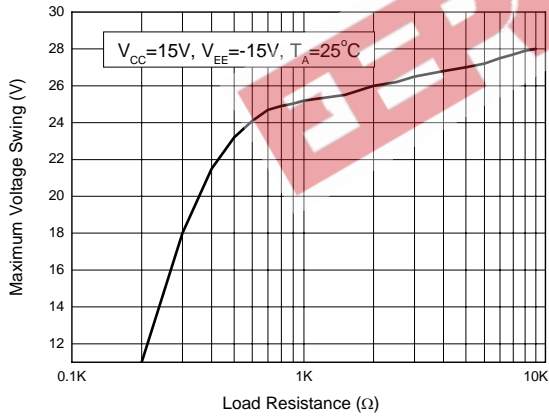


Figure 6. Maximum Output Voltage Swing vs. Load Resistance

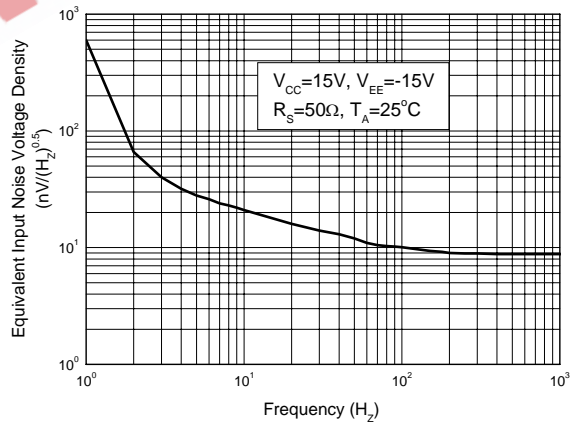


Figure 7. Equivalent Input Noise Voltage Density vs. Frequency



**DUAL OPERATIONAL AMPLIFIERS**

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**Typical Performance Characteristics (Continued)**

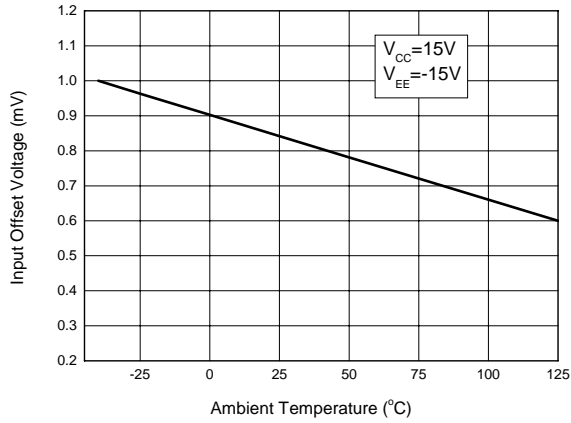


Figure 8. Input Offset Voltage vs. Temperature

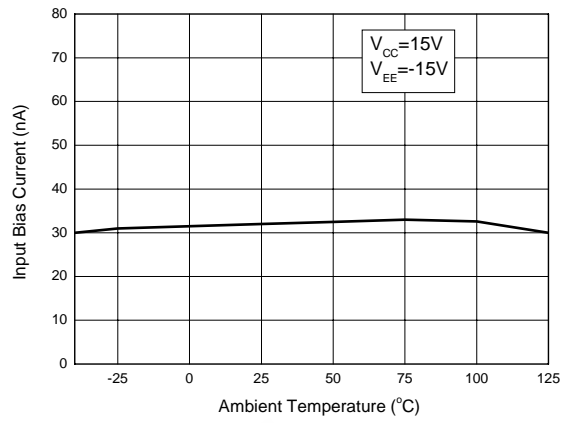


Figure 9. Input Bias Current vs. Temperature

**Typical Application**

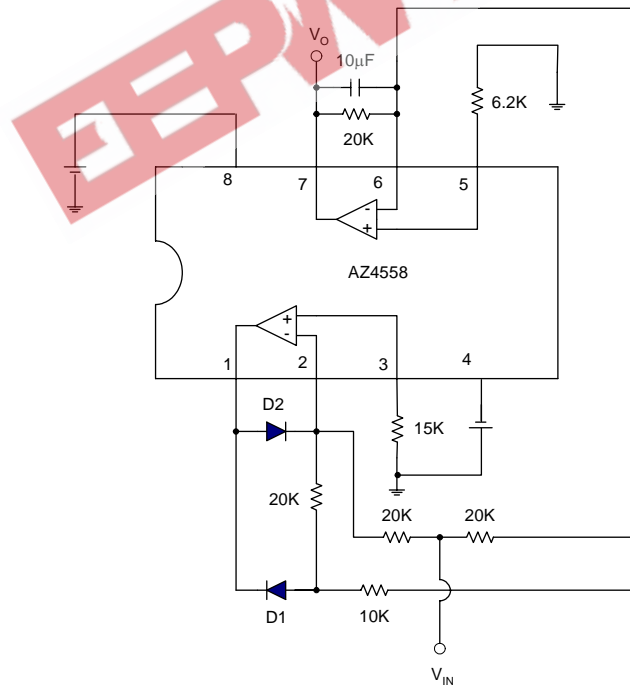


Figure 10. Application of AZ4558 in an AC/DC Converter



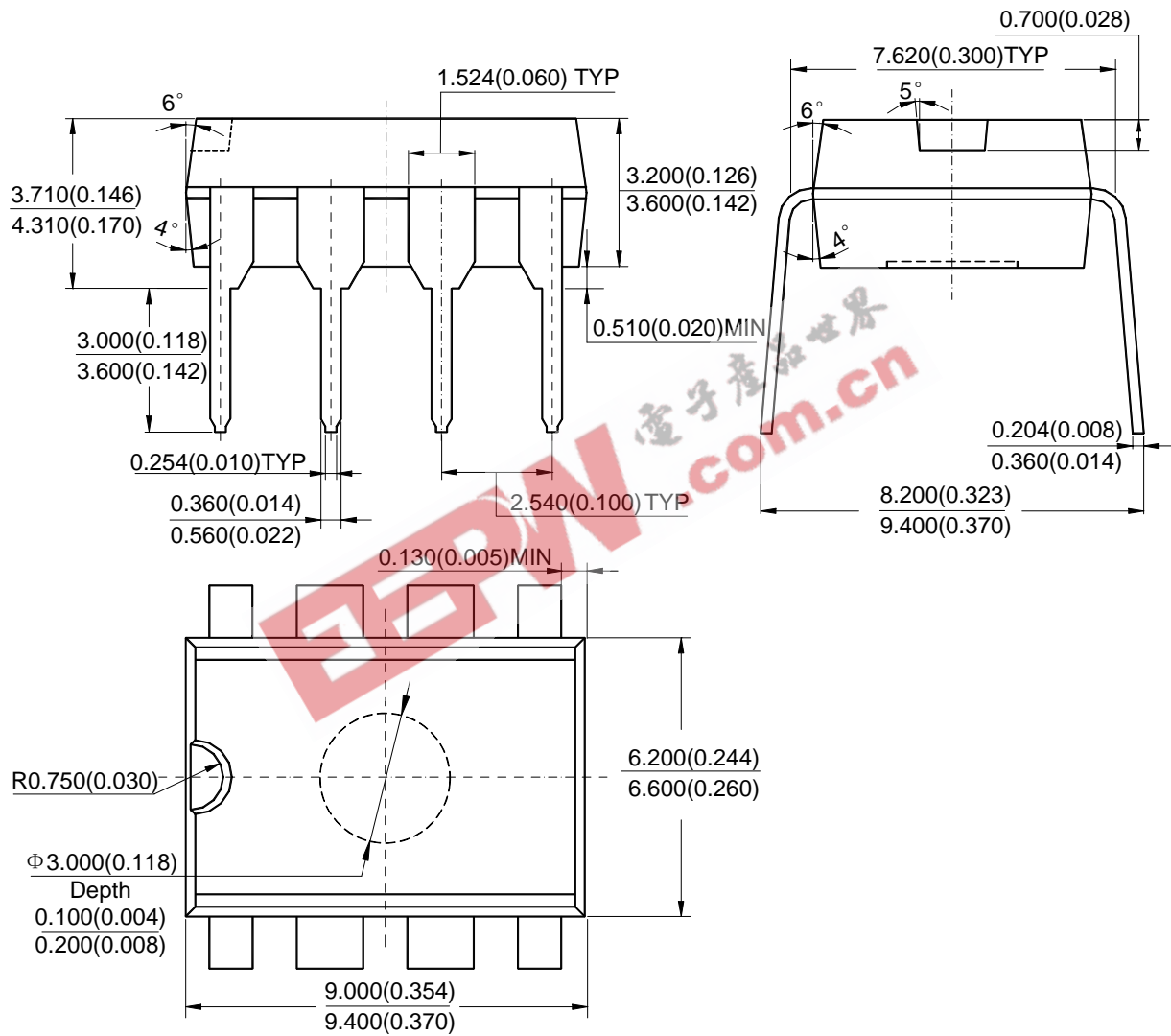
**DUAL OPERATIONAL AMPLIFIERS**

**AZ4558**

**Mechanical Dimensions**

**DIP-8**

**Unit: mm(inch)**







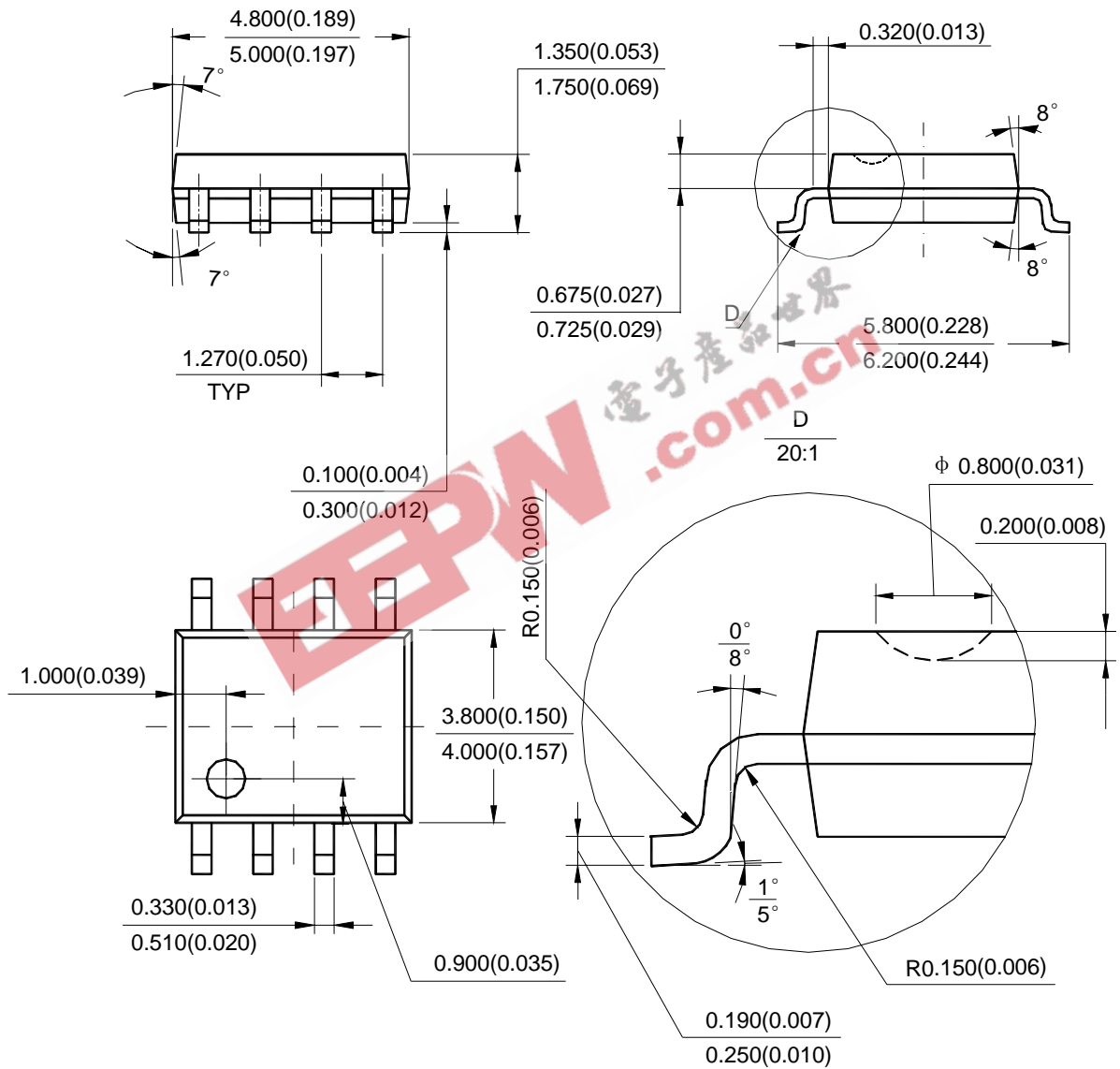
**DUAL OPERATIONAL AMPLIFIERS**

**AZ4558**

**Mechanical Dimensions (Continued)**

**SOIC-8**

**Unit: mm(inch)**





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