

**DUAL LOW NOISE OPERATIONAL AMPLIFIERS****AZ4580****General Description**

The AZ4580 is a monolithic dual low noise operational amplifier. It is specifically designed for audio systems to improve tone control; it can also be used in pre-amplifier, industrial measurement tools and applications where gain and phase matched channels are mandatory.

The IC features internal frequency compensation, low noise, low distortion, high gain and high bandwidth. The AZ4580 can operate under dual power supply voltage up to $\pm 18\text{V}$ or single power supply up to 36V .

The AZ4580 is available in DIP-8, SOIC-8, SIP-8 and TSSOP-8 packages.

Features

- Large Signal Voltage Gain: 110dB Typical
- Low Input Noise Voltage: $0.7 \mu\text{V}_{\text{RMS}}$ (RIAA) Typical
- Wide Gain Bandwidth Product: 15 MHz at 10KHz Typical
- Low Distortion: 0.0005% Typical
- Slew Rate: $7\text{V}/\mu\text{s}$ Typical

Applications

- Audio AC-3 Decoder System
- Audio Amplifier

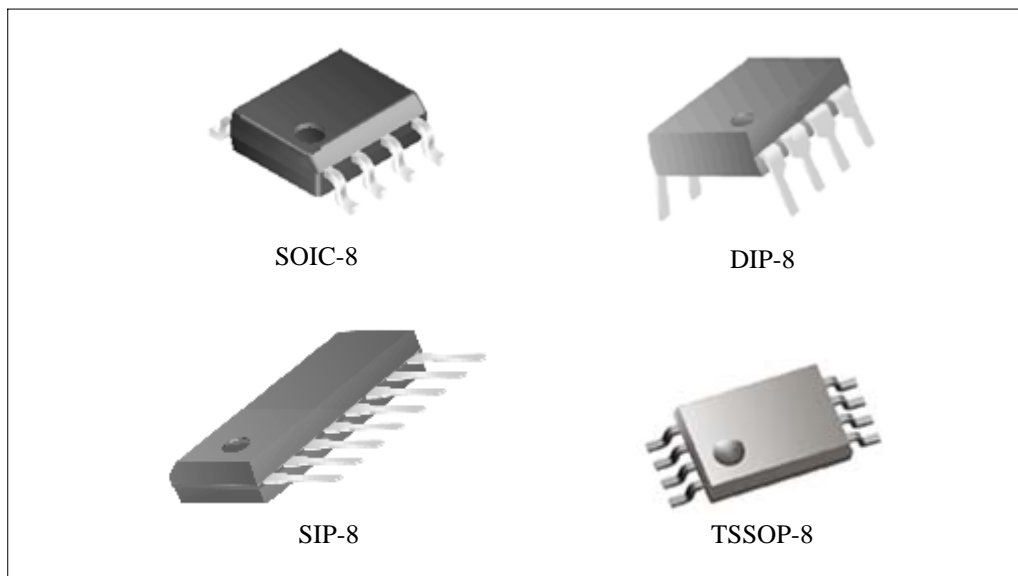


Figure 1. Package Types of AZ4580



DUAL LOW NOISE OPERATIONAL AMPLIFIERS

AZ4580

Pin Configuration

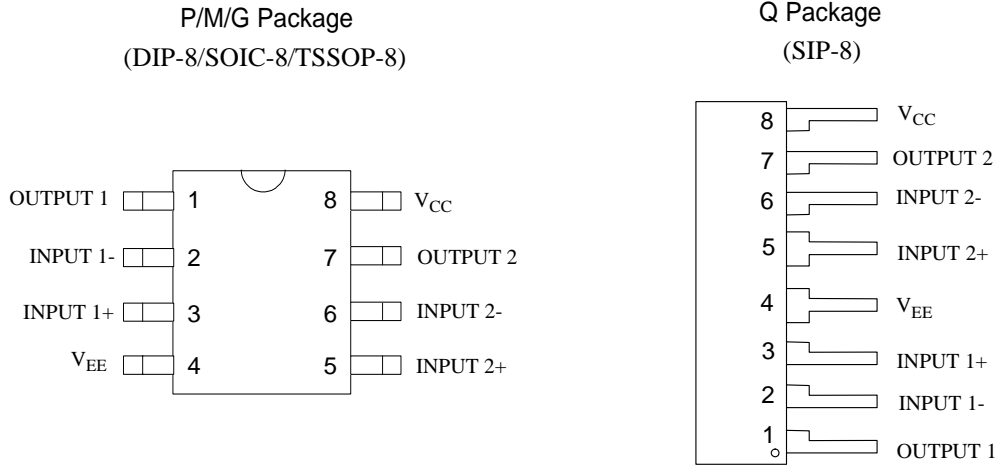


Figure 2. Pin Configuration of AZ4580 (Top View)

Pin Description

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	OUTPUT 1	2	INPUT 1-	3	INPUT 1+	4	V_{EE}
5	INPUT 2+	6	INPUT 2-	7	OUTPUT 2	8	V_{CC}



DUAL LOW NOISE OPERATIONAL AMPLIFIERS

AZ4580

Functional Block Diagram

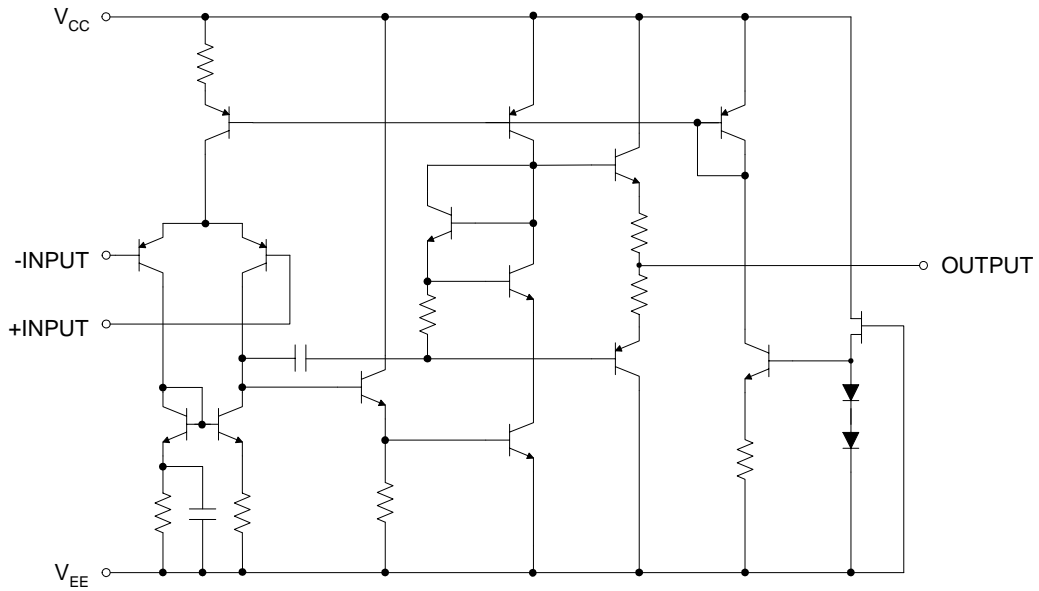


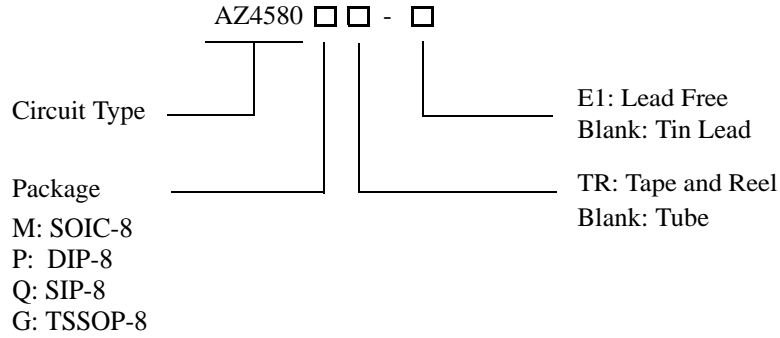
Figure 3. Representative Schematic Diagram of AZ4580 (Each Amplifier)



DUAL LOW NOISE OPERATIONAL AMPLIFIERS

AZ4580

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	AZ4580M	AZ4580M-E1	4580M	4580M-E1	Tube
		AZ4580MTR	AZ4580MTR-E1	4580M	4580M-E1	Tape & Reel
DIP-8	-40 to 85°C	AZ4580P	AZ4580P-E1	AZ4580P	AZ4580P-E1	Tube
SIP-8	-40 to 85°C	AZ4580Q	AZ4580Q-E1	AZ4580Q	AZ4580Q-E1	Tube
TSSOP-8	-40 to 85°C	AZ4580G	AZ4580G-E1	G80	EG80	Tube
		AZ4580GTR	AZ4580GTR-E1	G80	EG80	Tape & Reel

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

**DUAL LOW NOISE OPERATIONAL AMPLIFIERS****AZ4580****Absolute Maximum Ratings (Note 1)**

Parameter	Smbol	Value		Unit
Power 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		$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-65 to 150		$^{\circ}\text{C}$
Lead Temperature (Soldering 10s)	T_L	260		$^{\circ}\text{C}$
Power Dissipation ($T_A=25^{\circ}\text{C}$)	P_D	TSSOP-8	400	mW
		SOIC-8	500	
		SIP-8	750	
		DIP-8	800	

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	$^{\circ}\text{C}$

**DUAL LOW NOISE OPERATIONAL AMPLIFIERS****AZ4580****Electrical Characteristics**Operating Conditions: $V_{CC}=+15V$, $V_{EE}=-15V$, $T_A=25^{\circ}C$ unless otherwise specified.

Parameter	Conditions	Min	Typ	Max	Unit
Supply Current	no load		4	7	mA
Input Offset Voltage	$R_S \leq 10K\Omega$		0.5	3	mV
Input Offset Current	$V_{CM}=0V$		5	100	nA
Input Bias Current	$V_{CM}=0V$		150	500	nA
Input Common Mode Voltage Range		± 12	± 13.5		V
Common Mode Rejection Ratio	$V_{CM}=0V$ to $V_{CC}-1.5V$, $R_S \leq 10K\Omega$	80	110		dB
Large Signal Voltage Gain	$R_L=2K\Omega$, $V_O=\pm 10V$	90	110		dB
Power Supply Rejection Ratio	$R_S \leq 10K\Omega$	80	110		dB
Output Sink Current	$V_-=1V$, $V_+=0V$, $V_O=2V$		80		mA
Output Source Current	$V_+=1V$, $V_-=0V$, $V_O=2V$		45		mA
Slew Rate	$R_L \geq 2K\Omega$		7		V/ μ S
Gain Bandwidth Product	$R_L=2K\Omega$, $f=10KHz$		15		MHz
Total Harmonic Distortion	$A_V=20dB$, $V_O=5V$ $R_L=2K\Omega$, $f=1KHz$		0.0005		%
Equivalent Input Noise Voltage	RIAA $R_S=50\Omega$, 30KHz LPF		0.7		μV_{RMS}



DUAL LOW NOISE OPERATIONAL AMPLIFIERS

AZ4580

Typical Performance Characteristics

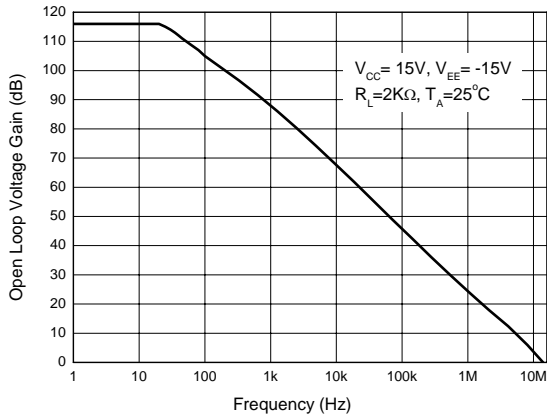


Figure 4. Open Loop Voltage Gain vs. Frequency

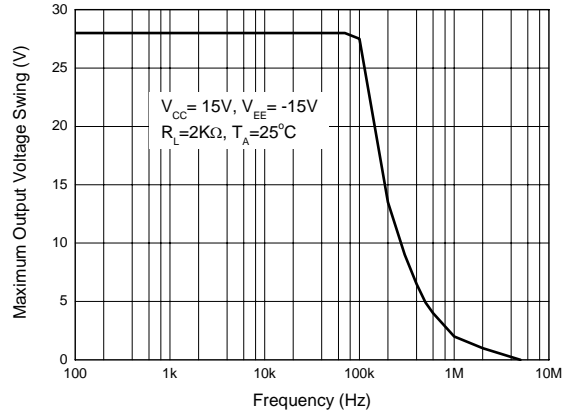


Figure 5. Maximum Output Voltage Swing vs. Frequency

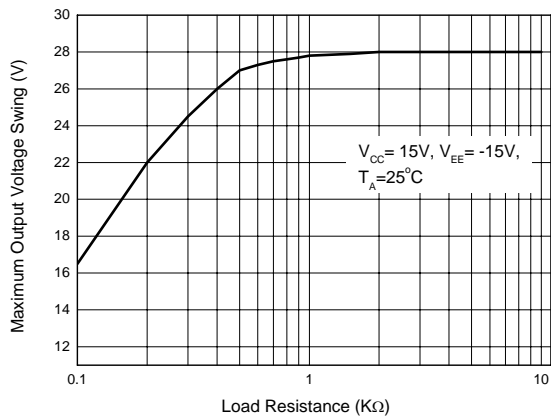


Figure 6. Maximum Output Voltage Swing vs. Load Resistance

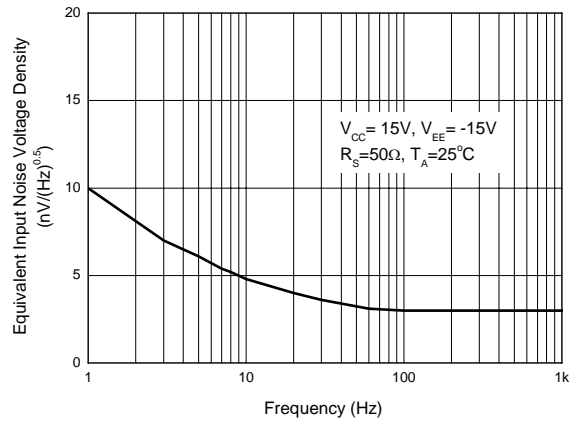


Figure 7. Equivalent Input Noise Voltage Density vs. Frequency



DUAL LOW NOISE OPERATIONAL AMPLIFIERS

AZ4580

Typical Performance Characteristics (Continued)

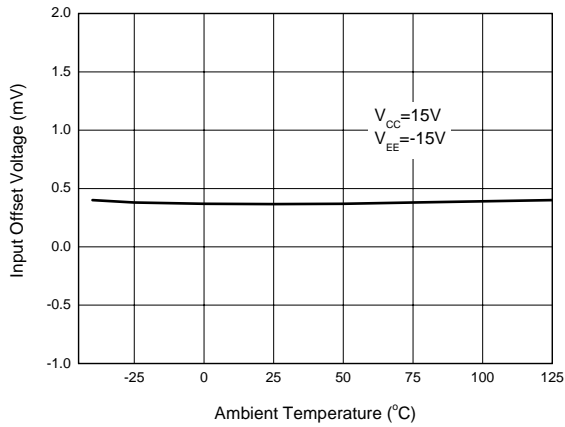


Figure 8. Input Offset Voltage vs. Temperature

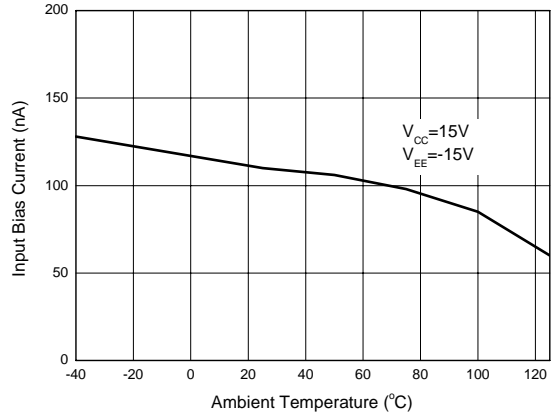


Figure 9. Input Bias Current vs. Temperature

Typical Applications

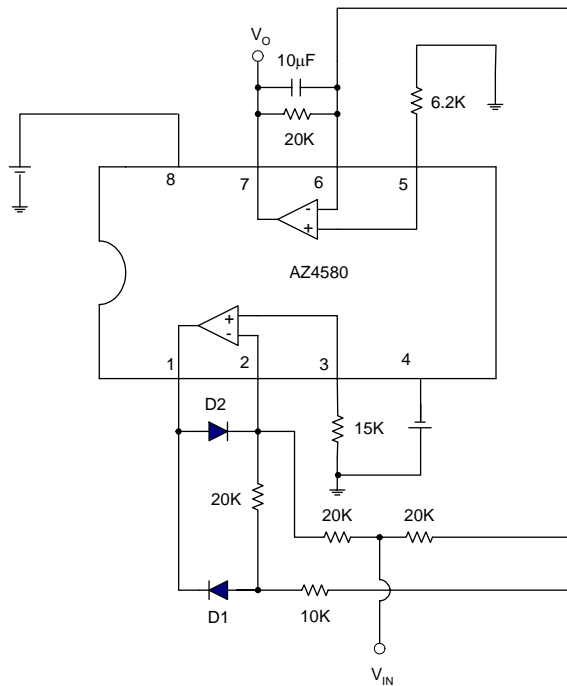


Figure 10. Application of AZ4580 in an AC/DC Converter



DUAL LOW NOISE OPERATIONAL AMPLIFIERS

AZ4580

Typical Applications (Continued)

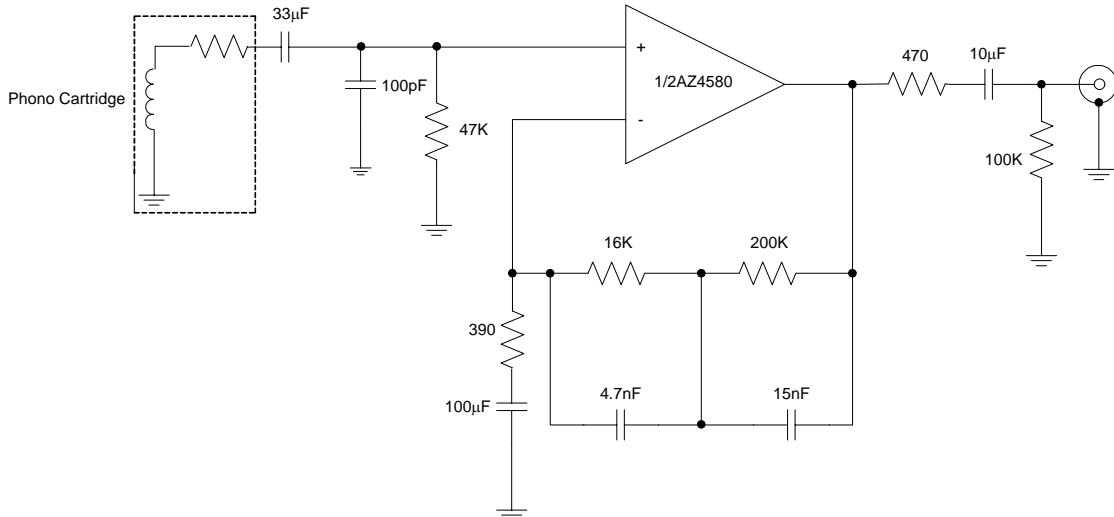


Figure11. Application of AZ4580 in a RIAA Preamp

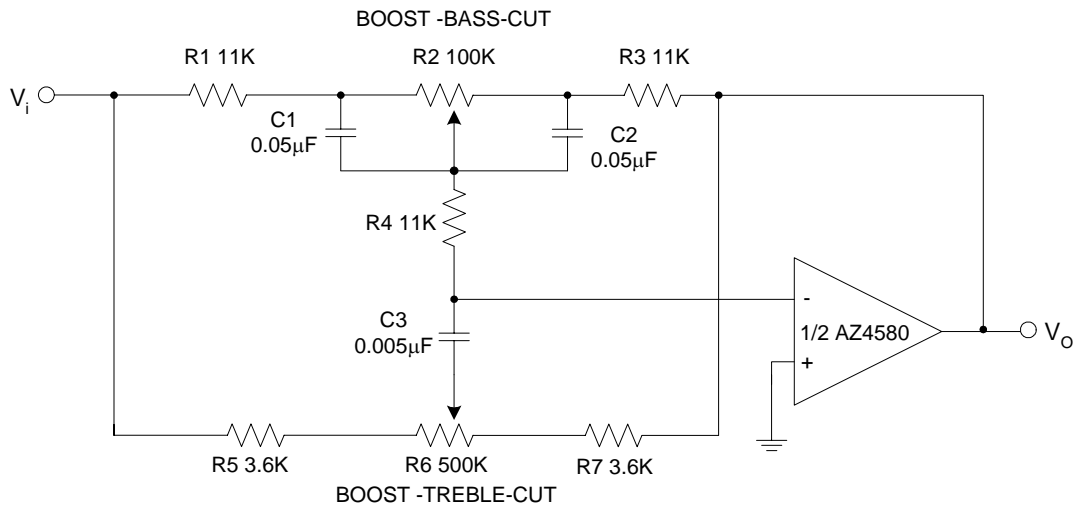


Figure12. Application of AZ4580 in Tone Control



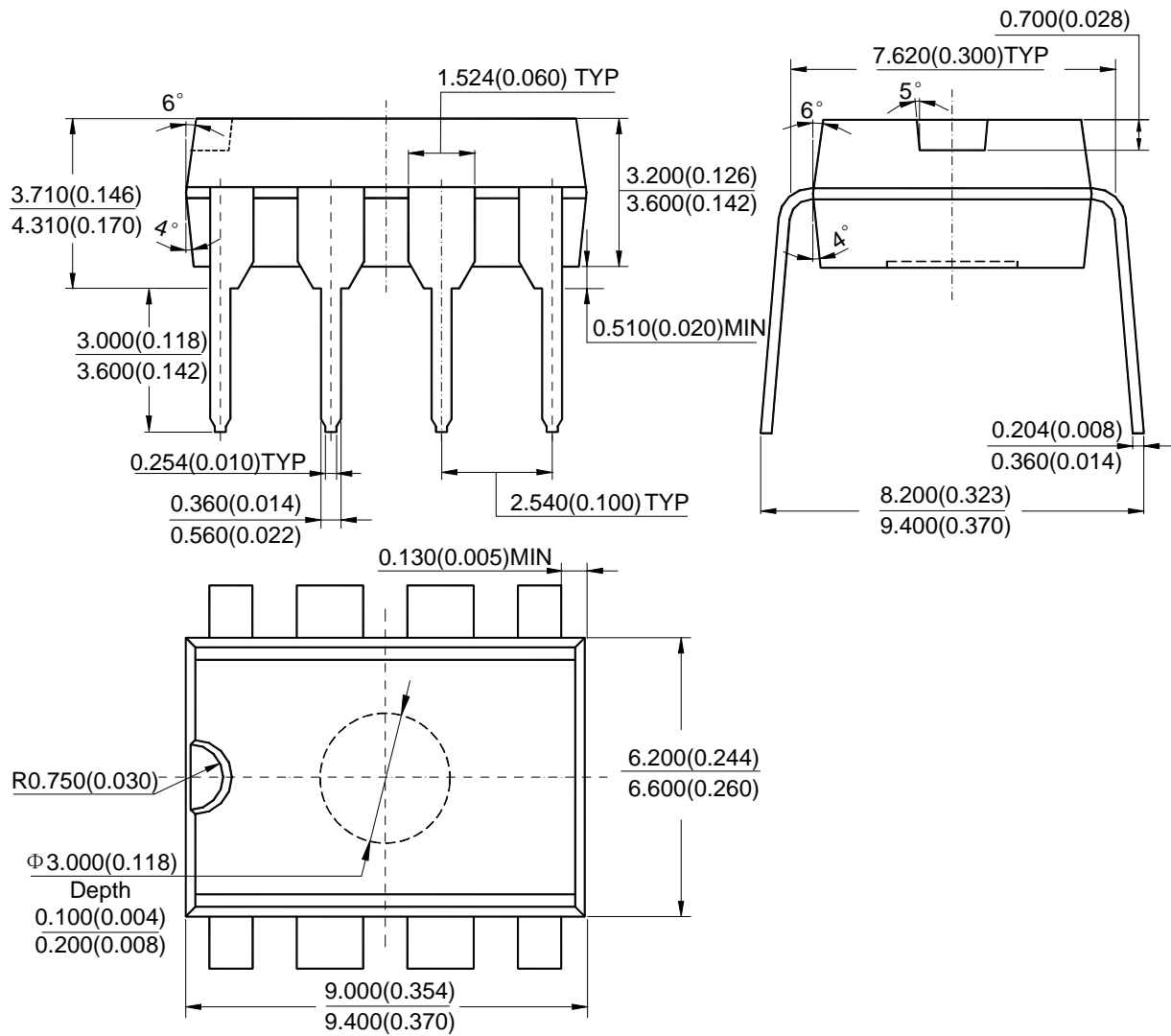
DUAL LOW NOISE OPERATIONAL AMPLIFIERS

AZ4580

Mechanical Dimensions

DIP-8

Unit: mm(inch)





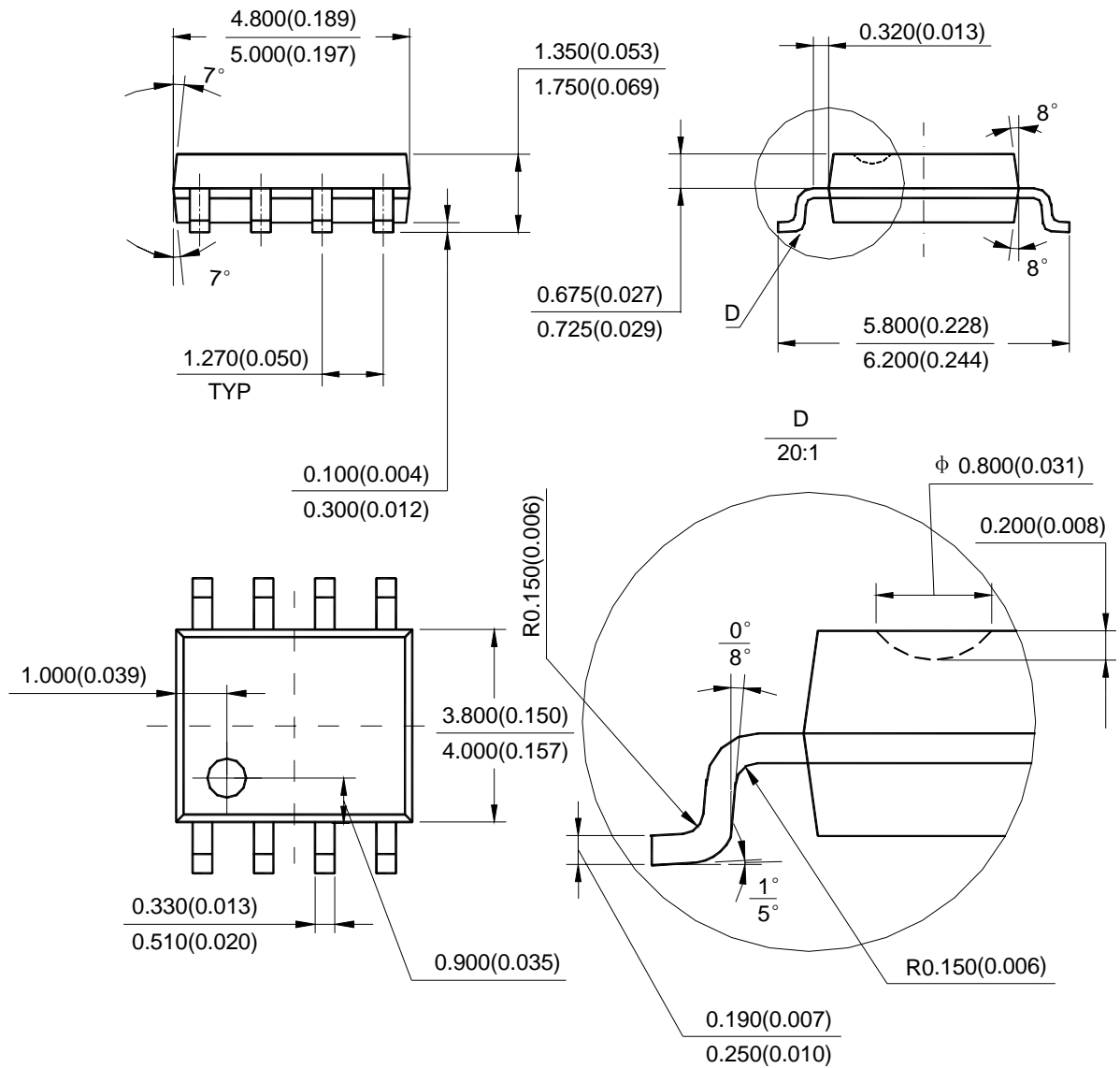
DUAL LOW NOISE OPERATIONAL AMPLIFIERS

AZ4580

Mechanical Dimensions (Continued)

SOIC-8

Unit: mm(inch)





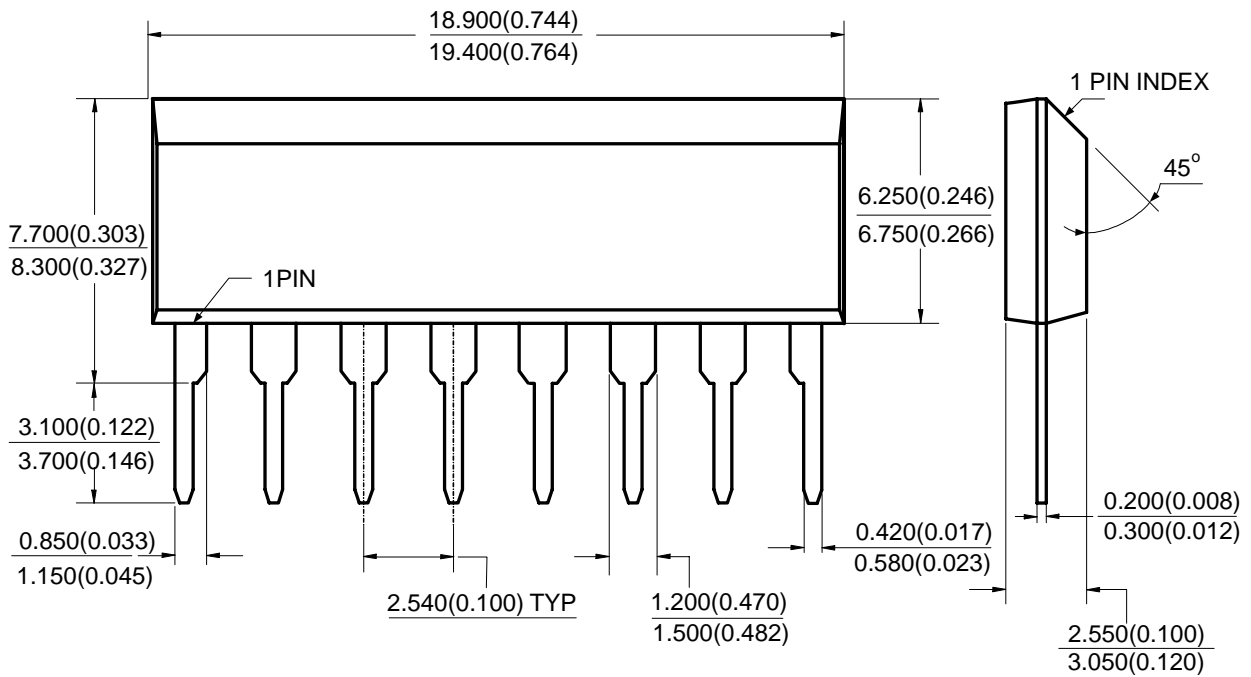
DUAL LOW NOISE OPERATIONAL AMPLIFIERS

AZ4580

Mechanical Dimensions (Continued)

SIP-8

Unit: mm(inch)





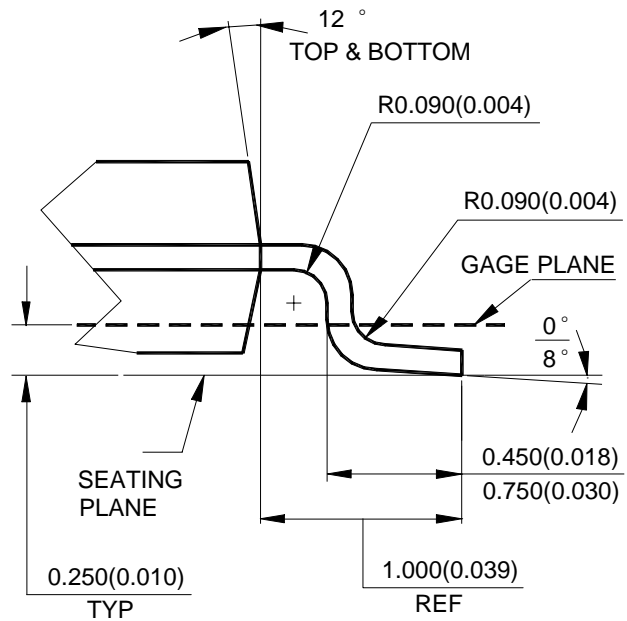
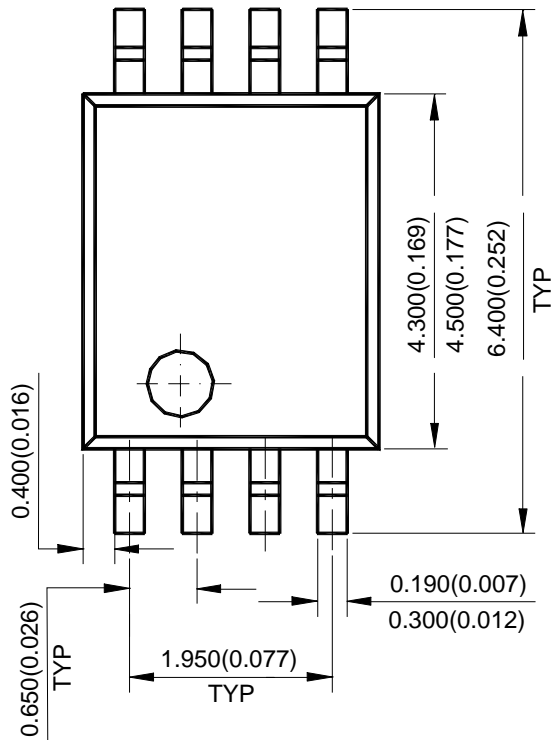
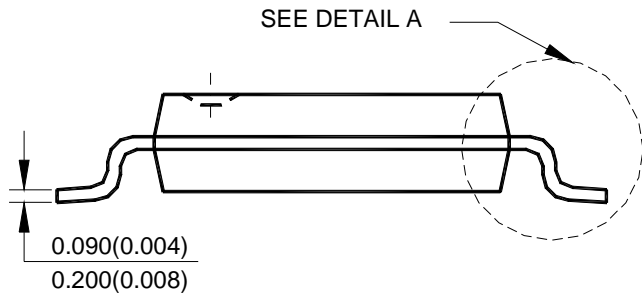
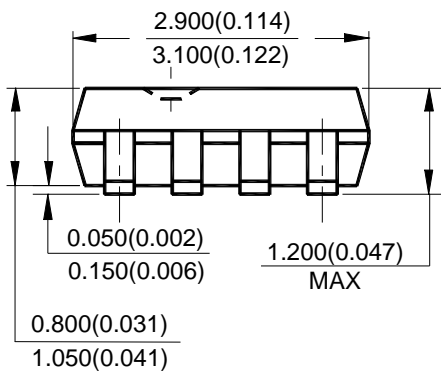
DUAL LOW NOISE OPERATIONAL AMPLIFIERS

AZ4580

Mechanical Dimensions (Continued)

TSSOP-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
27B, Tower C, 2070, Middle Shen Nan Road, Shenzhen 518031, China
Tel: +86-755-8368 3987, Fax: +86-755-8368 3166

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
3170 De La Cruz Blvd., Suite 105, Santa Clara,
CA 95054-2411, U.S.A
Tel: +1-408-988 6388, Fax: +1-408-988 6386