

FEATURES

- Low Noise, 80 nV p-p (0.1 Hz to 10 Hz)**
3 nV/ $\sqrt{\text{Hz}}$ @ 1 kHz
- Low Drift, 0.2 $\mu\text{V}/^\circ\text{C}$**
- High Speed, 17 V/ μs Slew Rate**
63 MHz Gain Bandwidth
- Low Input Offset Voltage, 10 μV**
- Excellent CMRR, 126 dB (Common-Voltage @ 11 V)**
- High Open-Loop Gain, 1.8 Million**
- Replaces 725, OP-07, SE5534 In Gains > 5**
- Available in Die Form**

GENERAL DESCRIPTION

The OP37 provides the same high performance as the OP27, but the design is optimized for circuits with gains greater than five. This design change increases slew rate to 17 V/ μs and gain-bandwidth product to 63 MHz.

The OP37 provides the low offset and drift of the OP07 plus higher speed and lower noise. Offsets down to 25 μV and a maximum drift of 0.6 $\mu\text{V}/^\circ\text{C}$ make the OP37 ideal for precision instrumentation applications. Exceptionally low noise ($e_n = 3.5 \text{ nV/} @ 10 \text{ Hz}$), a low 1/f noise corner frequency of 2.7 Hz, and the high gain of 1.8 million, allow accurate high-gain amplification of low-level signals.

The low input bias current of 10 nA and offset current of 7 nA are achieved by using a bias-current cancellation circuit. Over the military temperature range this typically holds I_B and I_{OS} to 20 nA and 15 nA respectively.

The output stage has good load driving capability. A guaranteed swing of 10 V into 600 Ω and low output distortion make the OP37 an excellent choice for professional audio applications.

PSRR and CMRR exceed 120 dB. These characteristics, coupled with long-term drift of 0.2 $\mu\text{V}/\text{month}$, allow the circuit designer to achieve performance levels previously attained only by discrete designs.

Low-cost, high-volume production of the OP37 is achieved by using on-chip zener-zap trimming. This reliable and stable offset trimming scheme has proved its effectiveness over many years of production history.

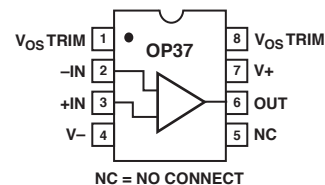
The OP37 brings low-noise instrumentation-type performance to such diverse applications as microphone, tapehead, and RIAA phono preamplifiers, high-speed signal conditioning for data acquisition systems, and wide-bandwidth instrumentation.

PIN CONNECTIONS

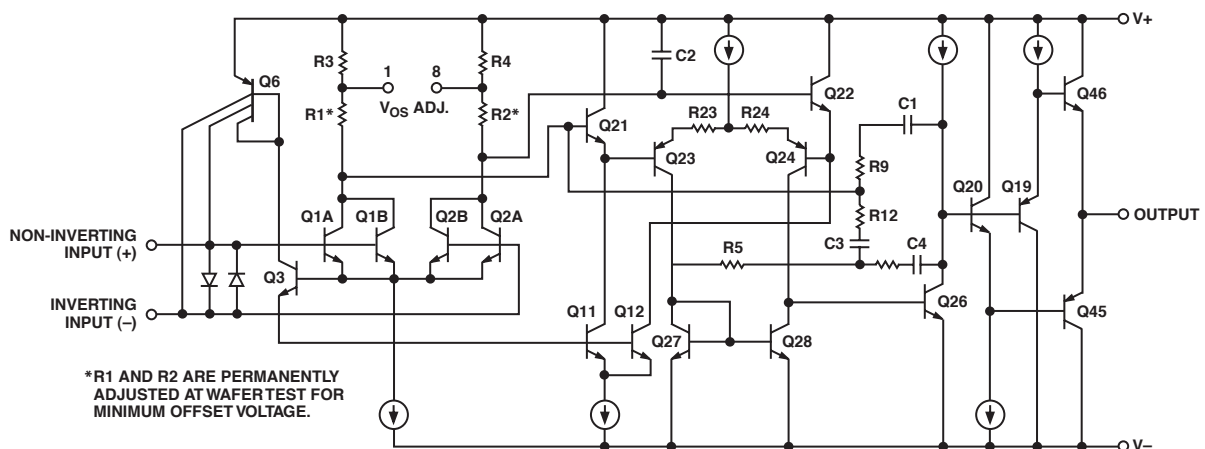
8-Lead Hermetic DIP
(Z Suffix)

Epoxy Mini-DIP
(P Suffix)

8-Lead SO
(S Suffix)



SIMPLIFIED SCHEMATIC



REV. B

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OP37

ABSOLUTE MAXIMUM RATINGS⁴

Supply Voltage	22 V
Internal Voltage (Note 1)	22 V
Output Short-Circuit Duration	Indefinite
Differential Input Voltage (Note 2)	0.7 V
Differential Input Current (Note 2)	25 mA
Storage Temperature Range	-65°C to +150°C
Operating Temperature Range	
OP37A	-55°C to +125°C
OP37E (Z)	-25°C to +85°C
OP37E, OP-37F (P)	0°C to 70°C
OP37G (P, S, Z)	-40°C to +85°C
Lead Temperature Range (Soldering, 60 sec)	300°C
Junction Temperature	-45°C to +150°C

Package Type	θ_{JA}^3	θ_{JC}	Unit
8-Lead Hermetic DIP (Z)	148	16	°C/W
8-Lead Plastic DIP (P)	103	43	°C/W
8-Lead SO (S)	158	43	°C/W

NOTES

¹For supply voltages less than 22 V, the absolute maximum input voltage is equal to the supply voltage.

²The OP37's inputs are protected by back-to-back diodes. Current limiting resistors are not used in order to achieve low noise. If differential input voltage exceeds 0.7 V, the input Current should be limited to 25 mA.

³ θ_{JA} is specified for worst case mounting conditions, i.e., θ_{JA} is specified for device in socket for TO, CerDIP, P-DIP, and LCC packages; θ_{JA} is specified for device soldered to printed circuit board for SO package.

⁴Absolute maximum ratings apply to both DICE and packaged parts, unless otherwise noted.

ORDERING GUIDE

$T_A = 25^\circ\text{C}$ $V_{OS\ MAX}$ (μV)	CerDIP 8-Lead	Plastic 8-Lead	Operating Temperature Range
25	OP37AZ*		MIL
25	OP37EZ	OP37EP	IND/COM
60		OP37FP*	IND/COM
100		OP37GP	XIND
100	OP37GZ	OP37GS	XIND

*Not for new design, obsolete, April 2002.

CAUTION

ESD (electrostatic discharge) sensitive device. Electrostatic charges as high as 4000 V readily accumulate on the human body and test equipment and can discharge without detection. Although the OP37 features proprietary ESD protection circuitry, permanent damage may occur on devices subjected to high-energy electrostatic discharges. Therefore, proper ESD precautions are recommended to avoid performance degradation or loss of functionality.



