MONOLITHIC OP AMPS HAVE WIDE BANDWIDTH, LOW DISTORTION

Current-feedback AD9617 and AD9618 are optimized for choice of gains

Proprietary architecture offers exceptional dynamic performance

The AD9617* and AD9618* monolithic op amps use current feedback and an innovative architecture (patent pending) to provide high speed operation at low cost. The two devices (see Table) are very similar; both have flat wideband closed-loop frequency response and low harmonic distortion, combined with superior dc linearity—commensurate with 16-bit applications.

SPECIFICATION	AD9617	AD9618
Gain Range (V/V)	±1 to ±40	+5/−1 to ±100
Distortion at 20 MHz (2nd h, dBc)	−67	−63
Small-Signal Bandwidth (MHz)	190 (A_V = +3)	160 (A_V = +10)
Large-Signal Bandwidth (MHz)	150 (4 Vp-p)	150 (5 Vp-p)
Settling time (ns)	9 to 0.1%	
	14 to 0.02%	
Input Offset Voltage (mV)	0.5 typ, 2.2 max	
Input Offset Voltage Drift (μV/°C)	3 typ, 10 max	
Input Bias Current, Inverting (μA)	50 (max)	45 (max)
Output Impedance at dc (Ω)	0.07	0.08
Output Current, 50-Ω Load (mA)	60	60

The op amps differ in their optimal closed-loop gain range: the AD9617 is intended for lower gains—from ±1 to ±15—but will provide desirable performance at gains up to ±40 V/V; the AD9618 is more suitable for the higher gains up to ±100 (but can be used down to gain of +5 and −1). The AD9617's second-harmonic distortion spec at 20 MHz is −67 dBc, and it maintains 190-MHz small signal bandwidth at gain of +3 V/V and 150-MHz large-signal bandwidth at 4 V peak-to-peak output. For the AD9618, the corresponding specifications are −63 dBc distortion at 20 MHz, with 160 MHz small signal bandwidth at gain of +10 V/V and 150 MHz large signal bandwidth with 5-V p-p full-scale output.

Applications for these op amps include driving flash a/d converters, such as the AD9020 and AD9060 (see page 3), current-to-voltage conversion of fast d/a-converter outputs, and preamplification stages for photodiodes and CCD sensors. They will be found in instrumentation designs, communications systems, and video processors. The performance of the AD9617 and AD9618 is superior in most respects to hybrid devices, and their 8-pin DIP or small-outline surface mount IC packages save considerable space.

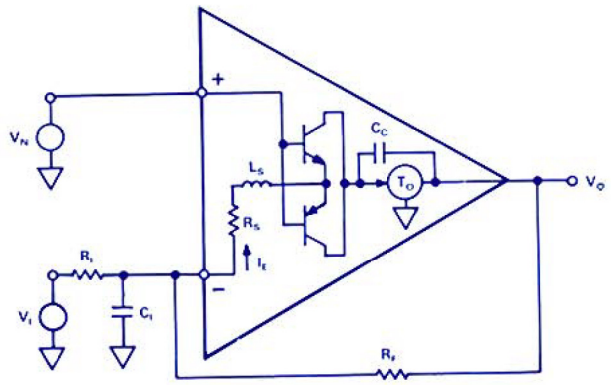
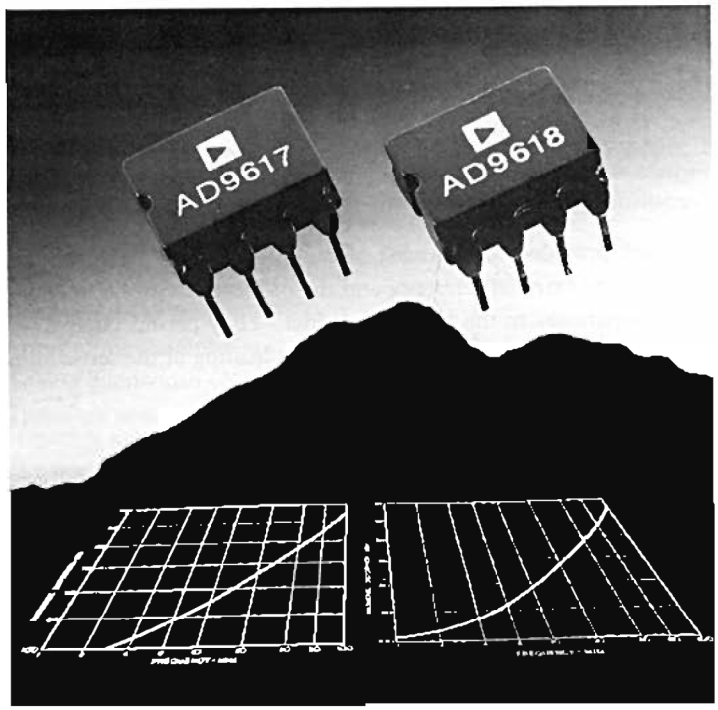


Figure 1. Equivalent circuit.

*Use the reply card for technical data.



Architecture: Feedback amplifiers (of which operational amplifiers are a subclass) employ two basic types of topology: voltage feedback and current feedback (*see* "Current Feedback and Transimpedance," *Analog Dialogue* 23-3, page 22). Circuits designed for *voltage feedback* generally have a relatively constant gain-bandwidth product, which forces the closed-loop bandwidth to vary inversely with the closed loop gain. In addition, slew-rate limiting in these amplifiers causes the large-signal bandwidth to be much less than the small-signal value.

Current feedback, also used in Analog Devices' op amps such as the AD844 (*Analog Dialogue* 23-2) and AD9610 (*Analog Dialogue* 21-1) provides two advantages over voltage-feedback: slew-rate limiting is avoided, so large signal bandwidth is nearly equal to

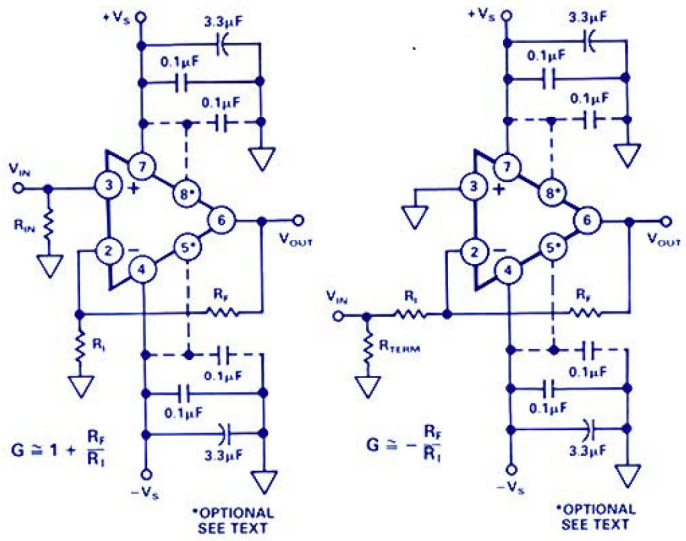


Figure 2. Configurations for noninverting (left) and inverting (right) operation.