ANALOG DEVICES

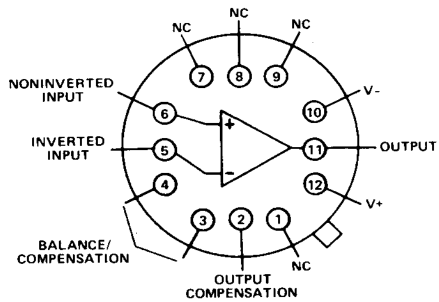
Ultrafast FET Operational Amplifiers

ADLH0032G/ADLH0032CG

FEATURES
- 2nd Source; Replaces All LH0032G
- High Slew Rate; 500V/μs
- Wide 70MHz Bandwidth
- Operation Guaranteed -55°C to +125°C (ADLH0032G)
- High Input Impedance of $10^{12}\,\Omega$
- 2mV Input Offset Voltage

APPLICATIONS
- ADC and SHA Input Buffers
- High Speed Integrators
- Video Amplifiers

ADLH0032G/ADLH0032CG PIN CONFIGURATIONS



TO-8 PACKAGE
BOTTOM VIEW

GENERAL DESCRIPTION

The ADLH0032G and ADLH0032CG are high slew rate, high input impedance, differential operational amplifiers, suitable for numerous applications in high-speed signal processing. These second-source devices are the same in every characteristic as other LH0032G/LH0032CG amplifiers.

Featuring a wide 70MHz bandwidth, high input impedance ($10^{12}\,\Omega$), and high output drive capacity, the ADLH0032G and ADLH0032CG have already been designed into such applications as summing amplifiers in high-speed DACs, Buffer Amps in ADCs and high-speed SHAs, as well as other applications normally reserved for special purpose video amplifiers.

The ADLH0032G is guaranteed over the extended temperature range from -55°C to +125°C, while the commercial grade ADLH0032CG is guaranteed from -25°C to +85°C. Both devices are packaged in a TO-8 metal can package.

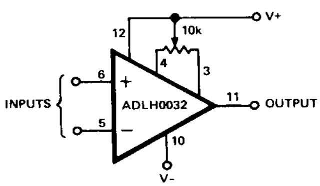


Figure 1. Offset Null

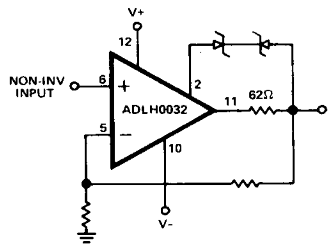


Figure 2. Output Short Circuit Protection

SPECIFICATIONS

Model	ADLH0032G, ADLH0032CG
ABSOLUTE MAXIMUM RATINGS	
Supply Voltage	±18V
Power Dissipation	See Characteristic Curves
Differential Input Voltage	±30V
Input Voltage	$\pm V_S$
Operating Temperature Range ADLH0032G	−55°C to +125°C
ADLH0032CG	−25°C to +85°C
Storage Temperature Range	−65°C to +150°C
Lead Temperature (soldering, 10sec)	300°C

Parameter	Conditions	ADLH0032G Min	ADLH0032G Typ	ADLH0032G Max	ADLH0032CG Min	ADLH0032CG Typ	ADLH0032CG Max	Units
DC ELECTRICAL CHARACTERISTICS[1]								
Input Offset Voltage[2]	T_J = +25°C		2	5 10		5	15 20	mV
Input Offset Current[2]	T_J = +25°C		5	25 25		10	50 5	pA nA
Input Bias Current[2]	T_J = +25°C		10	100 50		25	200 15	pA nA
Average Offset Voltage Drift			25	50		25	50	μV/°C
Large Signal Voltage Gain	V_{OUT} = ±10V, F = 1kHz, R_L = 1kΩ, T_C = +25°C	60	70		60	70		dB
	V_{OUT} = ±10V, R_L = 1kΩ, F = 1kHz	57			57			dB
Input Voltage Range		±10	±12		±10	±12		V
Output Voltage Swing	R_L = 1kΩ	±10	±13.5		±10	±13		V
Power Supply Rejection Ratio	ΔV_S = ±10V	50	60		50	60		dB
Common Mode Rejection Ratio	ΔV_{IN} = 10V	50	60		50	60		dB
Supply Current	T_C = +25°C		18	20		20	22	mA
AC ELECTRICAL CHARACTERISTICS[3]								
Slew Rate	A_V = +1, ΔV_{IN} = 20V	350	500		350	500		V/μs
Settling Time to 1% of Final Value	A_V = −1, ΔV_{IN} = 20V		100			100		ns
Settling Time to 0.1% of Final Value	A_V = −1, ΔV_{IN} = 20V		300			300		ns
Small Signal Rise Time	A_V = +1, ΔV_{IN} = 1V		8	20		8	20	ns
Small Signal Delay Time	A_V = +1, ΔV_{IN} = 1V		10	25		10	25	ns
MTBF								
Meantime Between Failures	1.0608×10^7							hours

NOTES
[1] These specifications apply for V_S = ±15V and −55°C to +125°C for the ADLH0032G and −25°C to +85°C for the ADLH0032CG.
[2] Due to high speed automatic test techniques employed these parameters are correlated to junction temperature.
[3] These specifications apply for V_S = ±15V, R_L = 1kΩ, T_C = +25°C.

Specifications subject to change without notice.

ORDERING INFORMATION

Model	Temperature Range	Package Option*
ADLH0032CG	−25°C to +85°C	TO-8 (H-12A)
ADLH0032G	−55°C to +125°C	TO-8 (H-12A)

*See Section 16 for package outline information.

POWER SUPPLY DECOUPLING

The ADLH0032G/ADLH0032CG, like most high-speed circuits, are sensitive to stray capacitances and layout. Power supplies should be bypassed as near to ±V (Pins 10 and 12) as possible, using low inductance capacitors such as 0.01μF disc ceramics. Components for compensation should also be located close to the appropriate pins to reduce stray capacitances. A large ground plane area for low-impedance ground paths is highly recommended.

HEAT SINKING

The ADLH0032G/ADLH0032CG are specified for operation without any heat sink. Since internal power dissipation does create a significant temperature rise, improved bias current performance can be achieved by using a small heat sink such as the Thermalloy 2241 or equivalent. Since the case of the ADLH0032G/ADLH0032CG has no internal connection, it may be electrically connected to the heat sink. This, however, will affect the stray capacitances to all pins, therefore requiring adjustment of all circuit compensation values.

INPUT CAPACITANCE

Inverting Input:

For optimum performance, the inverting input should be compensated by a small capacitance, around 10pF, across the feedback resistor. This is because the 5pF input capacitance may cause significant time constants with high-value resistors. The capacitor value may be changed somewhat depending on the effects of layout and closed loop gain.

Noninverting Input:

To divert leakage currents away from the noninverting input and to reduce the effective input capacitance, it is desirable to bootstrap the case and/or a guard conductor to the inverting input. The resulting input capacitance of a unity gain follower configured this way will be less than 1 picofarad.

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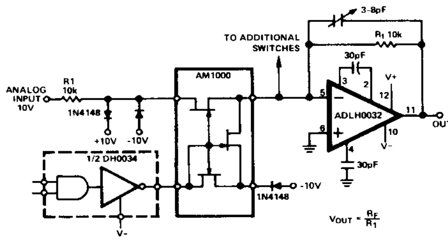


Figure 3. Current Mode Multiplexer

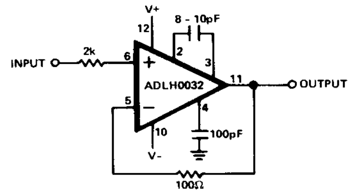


Figure 4. Unity Gain Follower

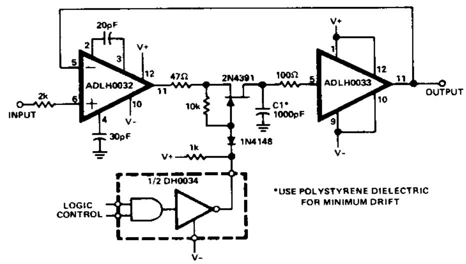
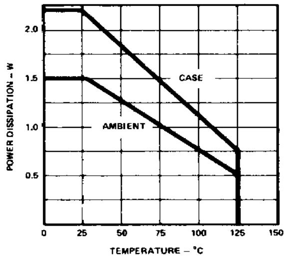
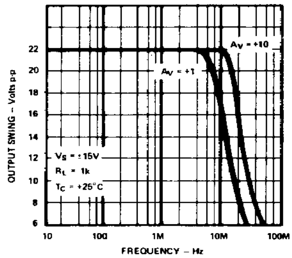


Figure 5. High Speed Sample and Hold

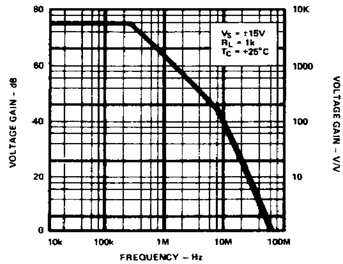
Typical Performance Curves



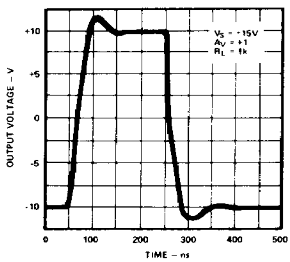
Maximum Power Dissipation



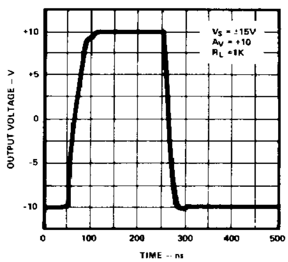
Large Signal Frequency Response



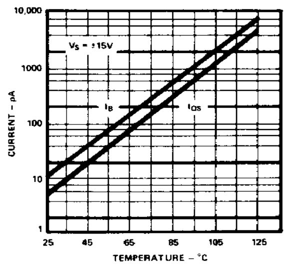
Open Loop Frequency Response



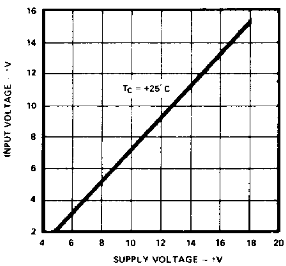
Large Signal Pulse Response



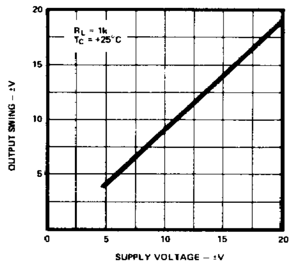
Large Signal Pulse Response



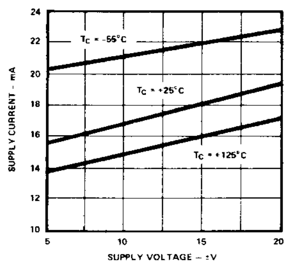
Input Bias and Offset Current vs. Temperature



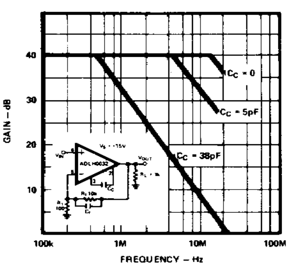
Input Voltage Range



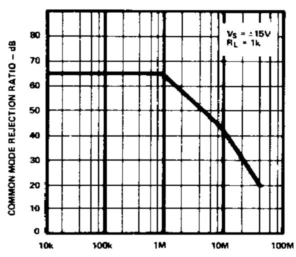
Output Swing



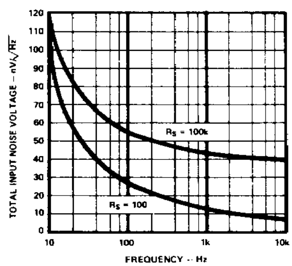
Supply Current vs. Supply Voltage



Closed Loop Frequency Response



Common Mode Rejection Ratio vs. Frequency



*Total Input Noise Voltage vs. Frequency**
**Includes Contribution From Source Resistance*