National Semiconductor

LH0061/LH0061C 0.5 Amp Wide Band Operational Amplifier

General Description

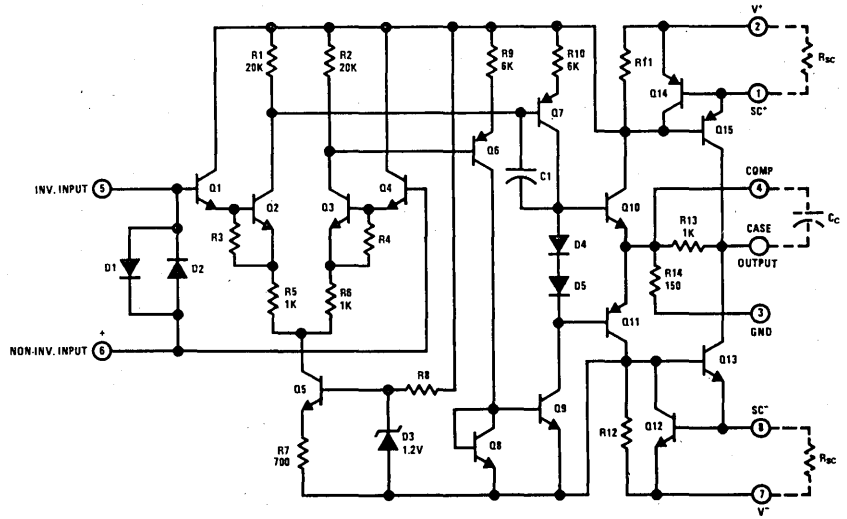
The LH0061/LH0061C is a wide band, high speed, operational amplifier capable of supplying currents in excess of 0.5 ampere at voltage levels of ±12V. Output short circuit protection is set by external resistors, and compensation is accomplished with a single external capacitor. With a suitable heat sink the device is rated at 20 Watts.

The wide bandwidth and high output power capabilities of the LH0061/LH0061C make it ideal for such applications as AC servos, deflection yoke drivers, capstan drivers, and audio amplifiers. The LH0061 is guaranteed over the temperature range −55°C to +125°C; whereas, the LH0061C is guaranteed from −25°C to +85°C.

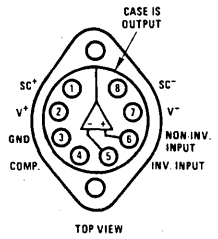
Features

- Output current 0.5 Amp
- Wide large signal bandwidth 1 MHz
- High slew rate 70V/μs
- Low standby power 240 mW
- Low input current 300 nA Max

Schematic and Connection Diagrams



TO-3 Package



Order Numbers:

LH0061K (−55°C to +125°C)
LH0061CK (−25°C to +85°C)
See Package K08A

Absolute Maximum Ratings

Supply Voltage	±18V
Power Dissipation	See Curve
Differential Input Current (Note 2)	±10 mA
Input Voltage (Note 3)	±15V
Peak Output Current	2A
Output Short Circuit Duration (Note 4)	Continuous
Operating Temperature Range LH0061	−55°C to +125°C
LH0061C	−25°C to +85°C
Storage Temperature Range	−65°C to +150°C
Lead Temperature (Soldering, 10 sec)	300°C

DC Electrical Characteristics (Note 1)

PARAMETER	CONDITIONS	LIMITS						UNITS
		LH0061			LH0061C			
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage	$R_S < 10\,k\Omega$, $T_C = 25°C$, $V_S = \pm15V$		1.0	4.0		3.0	10	mV
	$R_S < 10\,k\Omega$, $V_S = \pm15V$			6.0			15	mV
Voltage Drift with Temperature	$R_S < 10\,k\Omega$		5			5		µV/°C
Offset Voltage Change with Output Power			5			5		µV/watt
Input Offset Current	$T_C = 25°C$		30	100		50	200	nA
				300			500	nA
Offset Current Drift with Temperature			1			1		nA/°C
Input Bias Current	$T_C = 25°C$		100	300		200	500	nA
				1.0			1.0	µA
Input Resistance	$T_C = 25°C$	0.3	1.0		0.3	1.0		MΩ
Input Capacitance			3			3		pF
Common Mode Rejection Ratio	$R_S < 10\,k\Omega$, $\Delta V_{CM} = \pm10V$	70	90		60	80		dB
Input Voltage Range	$V_S = \pm15V$	±11			±11			V
Power Supply Rejection Ratio	$R_S < 10\,k\Omega$, $\Delta V_S = \pm10V$	70	80		50	70		dB
Voltage Gain	$V_S = \pm15V$, $V_O = \pm10V$							
	$R_L = 1\,k\Omega$, $T_C = 25°C$	50	100		25	50		V/mV
	$V_S = \pm15V$, $V_O = \pm10V$							
	$R_L = 20\Omega$	5			2.5			V/mV
Output Voltage Swing	$V_S = \pm15V$, $R_L = 20\Omega$	±10	±12		±10	±12		V
Output Short Circuit Current	$V_S = \pm15V$, $T_C = 25°C$, $R_{SC} = 1.0\Omega$		600			600		mA
Power Supply Current	$V_S = \pm15V$, $V_{OUT} = 0$		7	10		10	15	mA
Power Consumption	$V_S = \pm15V$, $V_{OUT} = 0$		210	300		300	450	mW

AC Electrical Characteristics ($T_C = 25°C$, $V_S = \pm15V$, $C_C = 3000\,pF$)

Slew Rate	$A_V = +1$, $R_L = 100\Omega$	25	70		25	70		V/µs
Power Bandwidth	$R_L = 100\Omega$		1			1		MHz
Small Signal Transient Response			30			30		ns
Small Signal Overshoot			5	20		10	30	%
Settling Time (0.1%)	$\Delta V_{IN} = 10V$, $A_V = +1$		0.8			0.8		µs
Overload Recovery Time			1			1		µs
Harmonic Distortion	$f = 1\,kHz$, $P_O = 0.5W$		0.2			0.2		%

Note 1: Specifications apply for $\pm5V \leq V_S \leq \pm18V$, $C_C = 3000\,pF$, and $-55°C \leq T_C \leq +125°C$ for the LH0061K and $-25°C \leq T_C \leq +85°C$ for the LH0061CK. Typical values are for $T_C = 25°C$.

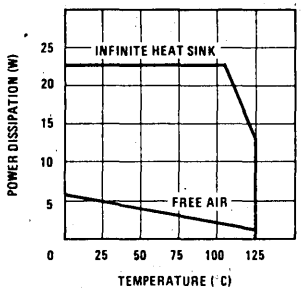
Note 2: The inputs are shunted with back-to-back diodes for overvoltage protection. Excessive current will flow if a differential voltage in excess of 1V is applied between the inputs without limiting resistors.

Note 3: For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

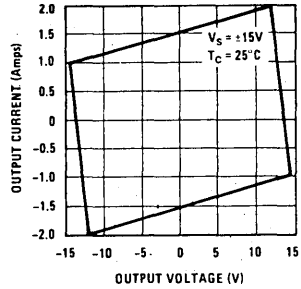
Note 4: Rating applies as long as package power rating is not exceeded.

Typical Performance Characteristics

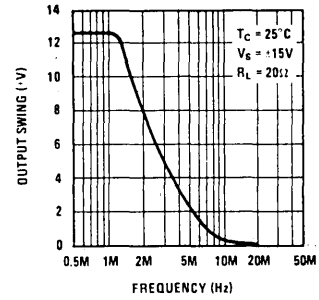
Power Derating



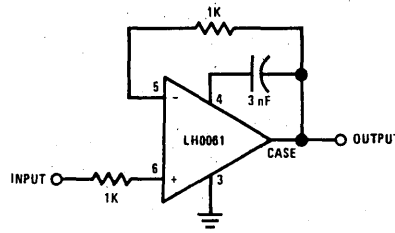
Safe Operating Area



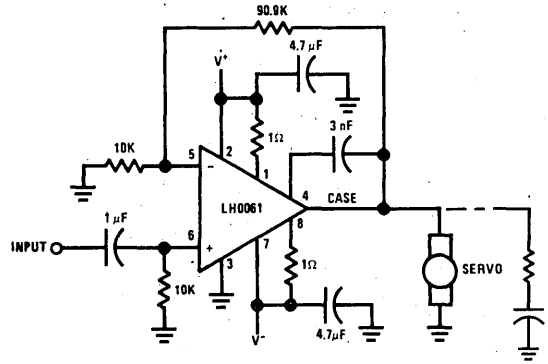
Large Signal Frequency Response



Typical Applications



Unity Gain Driver



AC Servo Amplifier