



# Operational Amplifiers

LH0061/LH0061C

## 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  $\pm 12V$ . 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.

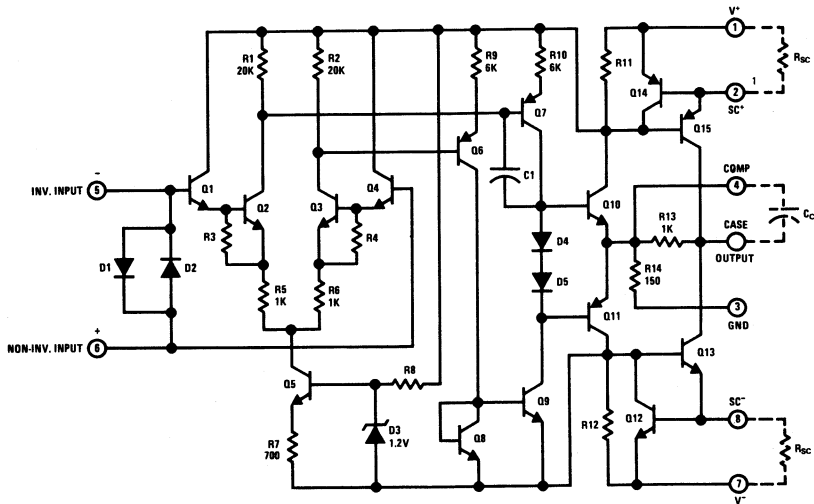
The wide bandwidth and high output power capabilities of the LH0061/LH0061C make it ideal for such applications as AC servos, deflection yoke drivers, capstan drivers, and audio amplifiers. The

LH0061 is guaranteed over the temperature range  $-55^{\circ}C$  to  $+125^{\circ}C$ ; whereas, the LH0061C is guaranteed from  $-25^{\circ}C$  to  $+85^{\circ}C$ .

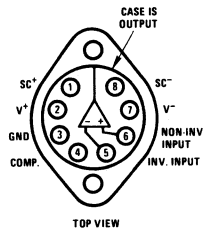
### features

- Output current 0.5 Amp
- Wide large signal bandwidth 1 MHz
- High slew rate 75 V/ $\mu$ s
- Low standby power 240 mW
- Low input current 300 nA Max

### schematic and connection diagrams



TO-3 Package



Order Numbers:

LH0061K ( $-55^{\circ}C$  to  $+125^{\circ}C$ )

LH0061CK ( $-25^{\circ}C$  to  $+85^{\circ}C$ )

See Package 19

## 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	$R_S \leq 10 \text{ k}\Omega$ , $T_C = 25^\circ\text{C}$ , $V_S = \pm 15\text{V}$ $R_S \leq 10 \text{ k}\Omega$ , $V_S = \pm 15\text{V}$		1.0	4.0 6.0		3.0	10 15	mV mV
Voltage Drift with Temperature	$R_S \leq 10 \text{ k}\Omega$		5			5		$\mu\text{V}/^\circ\text{C}$
Offset Voltage Change with Output Power			5			5		$\mu\text{V}/\text{watt}$
Input Offset Current	$T_C = 25^\circ\text{C}$		30	100 300		50	200 500	nA nA
Offset Current Drift with Temperature			1			1		$\text{nA}/^\circ\text{C}$
Input Bias Current	$T_C = 25^\circ\text{C}$		100	300 1.0		200	500 1.0	nA $\mu\text{A}$
Input Resistance	$T_C = 25^\circ\text{C}$	0.3	1.0		0.3	1.0		$\text{M}\Omega$
Input Capacitance			3			3		pF
Common Mode Rejection Ratio	$R_S \leq 10 \text{ k}\Omega$ , $\Delta V_{\text{CM}} = \pm 10\text{V}$	70	90		60	80		dB
Input Voltage Range	$V_S = \pm 15\text{V}$	±11			±11			V
Power Supply Rejection Ratio	$R_S \leq 10 \text{ k}\Omega$ , $\Delta V_S = \pm 10\text{V}$	70	80		50	70		dB
Voltage Gain	$V_S = \pm 15\text{V}$ , $V_O = \pm 10\text{V}$ $R_L = 1 \text{ k}\Omega$ , $T_C = 25^\circ\text{C}$ $V_S = \pm 15\text{V}$ , $V_O = \pm 10\text{V}$ $R_L = 20\Omega$	50	100		25	50		V/mV V/mV
Output Voltage Swing	$V_S = \pm 15\text{V}$ , $R_L = 20\Omega$	±10	±12		±10	±12		V
Output Short Circuit Current	$V_S = \pm 15\text{V}$ , $T_C = 25^\circ\text{C}$ , $R_{\text{SC}} = 1.0\Omega$		600			600		mA
Power Supply Current	$V_S = \pm 15\text{V}$ , $V_{\text{OUT}} = 0$		7	10		10	15	mA
Power Consumption	$V_S = \pm 15\text{V}$ , $V_{\text{OUT}} = 0$		210	300		300	450	mW

## ac electrical characteristics ( $T_C = 25^\circ\text{C}$ , $V_S = \pm 15\text{V}$ , $C_C = 3000 \text{ pF}$ )

Slow Rate	$A_V = +1$ , $R_L = 100\Omega$	50	70		50	70		V/ $\mu\text{s}$
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%)	$\Delta V_{\text{IN}} = 10\text{V}$ , $A_V = +1$		0.8			0.8		$\mu\text{s}$
Overload Recovery Time			1			1		$\mu\text{s}$
Harmonic Distortion	$f = 1 \text{ kHz}$ , $P_O = 0.5\text{W}$		0.2			0.2		%

**Note 1:** Specifications apply for  $\pm 5\text{V} \leq V_S \leq \pm 18\text{V}$ ,  $C_C = 3000 \text{ pF}$ , and  $-55^\circ\text{C} \leq T_C \leq +125^\circ\text{C}$  for the LH0061K and  $-25^\circ\text{C} \leq T_C \leq +85^\circ\text{C}$  for the LH0061CK. Typical values are for  $T_C = 25^\circ\text{C}$ .

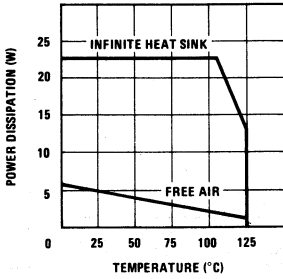
**Note 2:** The inputs are shunted with back-to-back diodes for overvoltage protection. Excessive current will flow if a differential voltage in excess of 1V is applied between the inputs without limiting resistors.

**Note 3:** For supply voltages less than  $\pm 15\text{V}$ , the absolute maximum input voltage is equal to the supply voltage.

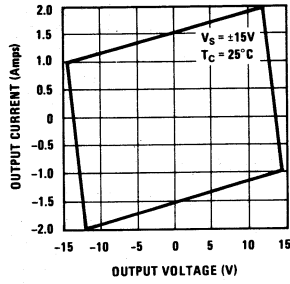
**Note 4:** Rating applies as long as package power rating is not exceeded.

# typical performance characteristics

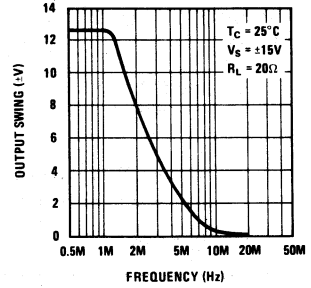
Power Derating



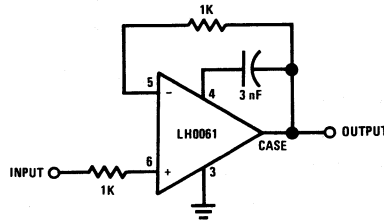
Safe Operating Area



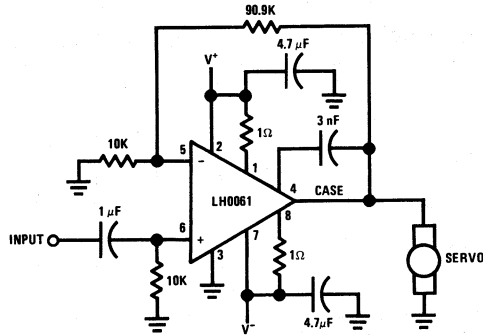
Large Signal Frequency Response



# typical applications



Unity Gain Driver



AC Servo Amplifier