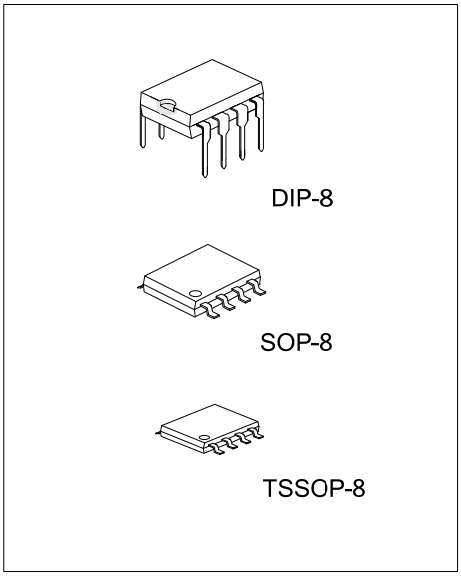
TL062

LINEAR INTEGRATED CIRCUIT

LOW POWER DUAL J-FET OPERATIONAL AMPLIFIER



■ DESCRIPTION

The UTC **TL062** is a high speed J-FET input dual operational amplifier. It incorporates well matched, high voltage J-FET and bipolar transistors in a monolithic integrated circuit. The device features high slew rates, low input bias and offset currents, and low offset voltage temperature coefficient.

■ FEATURES

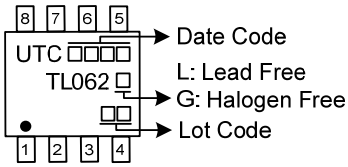
* Very low power consumption
* Wide common-mode (up to V_{CC}+) and differential voltage range
* Low input bias and offset current
* Output short-circuit protection
* High input impedance J-FET input stage
* Internal frequency compensation
* Latch up free operation
* Typical supply current: 400μA

■ ORDERING INFORMATION

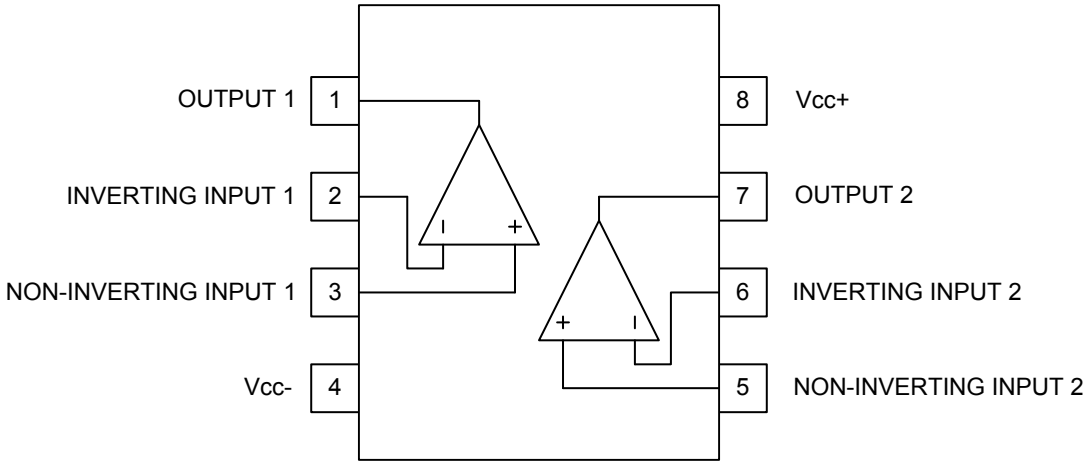
Ordering Number		Package	Packing
Lead Free	Halogen Free		
TL062L-D08-T	TL062G-D08-T	DIP-8	Tube
TL062L-S08-R	TL062G-S08-R	SOP-8	Tape Reel
TL062L-P08-R	TL062G-P08-R	TSSOP-8	Tape Reel

TL062G-D08-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube, R: Tape Reel (2) D08: DIP-8, S08: SOP-8, P08: TSSOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free

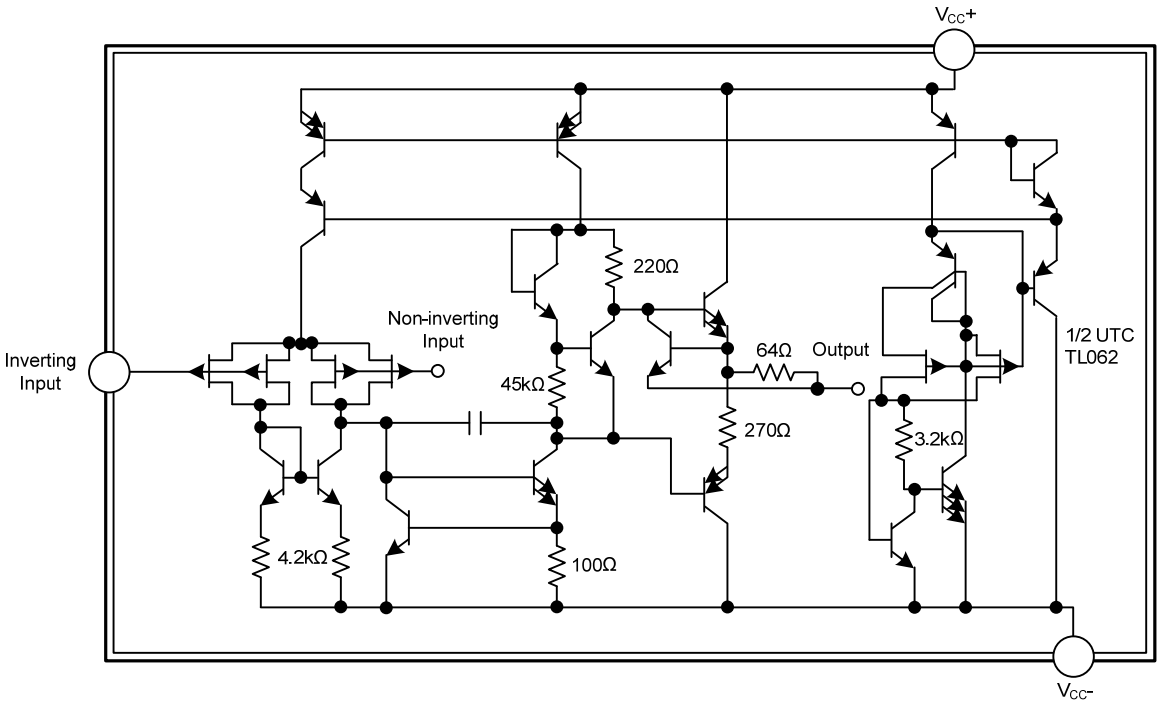
■ MARKING



■ PIN CONFIGURATIONS



■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage (note 2)		V_{CC}	±18	V
Input Voltage (note 3)		V_{IN}	±15	V
Differential Input Voltage (note 4)		$V_{I(DIFF)}$	±30	V
Power Dissipation	SOP-8	P_D	440	mW
	DIP-8		625	mW
	TSSOP-8		360	mW
Output Short-Circuit Duration (Note 5)			Infinite	
Operating Temperature		T_{OPR}	0 ~ +70	°C
Storage Temperature		T_{STG}	-65 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. All voltage values, except differential voltage, are with respect to the zero reference level (ground) of the supply voltages where the zero reference level is the midpoint between V_{CC}- and V_{CC}+.
3. The magnitude of the input voltage must never exceed the magnitude of the supply voltage or 15 volts, whichever is less.
4. Differential voltages are at the non-inverting input terminal with respect to the inverting input terminal.
5. The output may be shorted to ground or to either supply. Temperature and/or supply voltages must be limited to ensure that the dissipation rating is not exceeded.

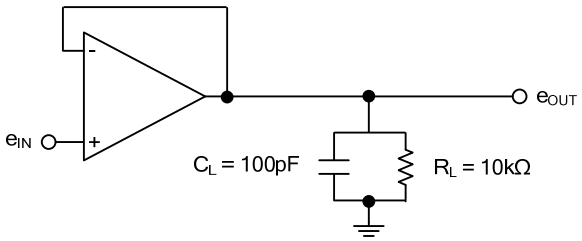
■ ELECTRICAL CHARACTERISTICS (V_{CC}=±15V, T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Input Offset Voltage	$V_{I(OFF)}$	R_S=50Ω	T_A=25°C		3	15	mV
			$T_{MIN} \le T_A \le T_{MAX}$			20	mV
Input Common Mode Voltage	$V_{I(CM)}$			±11	-12~+15		V
Output Voltage Swing	$V_{O(SW)}$	R_L=10kΩ, C_L=100pF	T_A=25°C	±10	±13.5		V
			$T_{MIN} \le T_A \le T_{MAX}$	±10			V
Large Signal Voltage Gain	G_V	R_L=10Ω, V_{OUT}=±10V	T_A=25°C	3	6		V/mV
			$T_{MIN} \le T_A \le T_{MAX}$	3			V/mV
Temperature Coefficient of Input Offset Voltage	$\Delta V_{I(OFF)}$	R_S=50Ω			10		μV/°C
Supply Current	I_{CC}	T_A=25°C, no load, no signal			400	500	μA
Input Offset Current*	$I_{I(OFF)}$	T_A=25°C			5	200	pA
		$T_{MIN} \le T_A \le T_{MAX}$				5	nA
Input Bias Current*	$I_{I(BIAS)}$	T_A=25°C			30	400	pA
		$T_{MIN} \le T_A \le T_{MAX}$				10	nA
Gain Bandwidth Product	GB_W	T_A=25°C, R_L=10kΩ, C_L=100Pf			1		MHz
Input Resistance	R_{IN}				10^{12}		Ω
Common Mode Rejection Ratio	CMR	R_S=50Ω		70	76		dB
Supply Voltage Rejection Ratio	SVR	R_S=50Ω		70	95		dB
Slew Rate	SR	V_{IN}=10V, R_L=10kΩ, C_L=100pF, Gv=1		0.91	1.1		V/μs
Channel Separation	$\frac{V_{O1}}{V_{O2}}$	Gv=100, T_A=25°C			120		dB
Total Power Consumption		T_A=25°C, no load, no signal			6	7.5	mW
Rise Time	t_R	V_{IN}=20mV, R_L=10kΩ, C_L=100pF, Gv=1			0.2		μs
Overshoot Factor	Kov	V_{IN}=20mV, R_L=10kΩ, C_L=100pF, Gv=1			10		%
Equivalent Input Noise Voltage	eN	R_S=100Ω, f=1KHz			42		

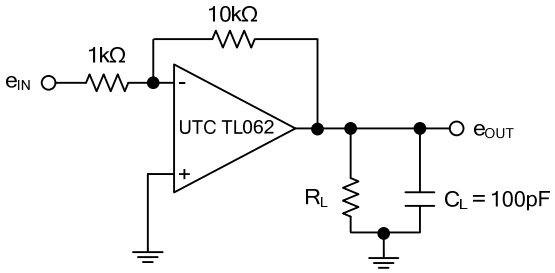
Note: The Input bias currents of a FET-input operational amplifier are normal junction reverse currents, which are temperature sensitive. Pulse techniques must be used that will maintain the junction temperature as closes to the ambient temperature as possible.

■ PARAMETER MEASUREMENT INFORMATION

Voltage Follower

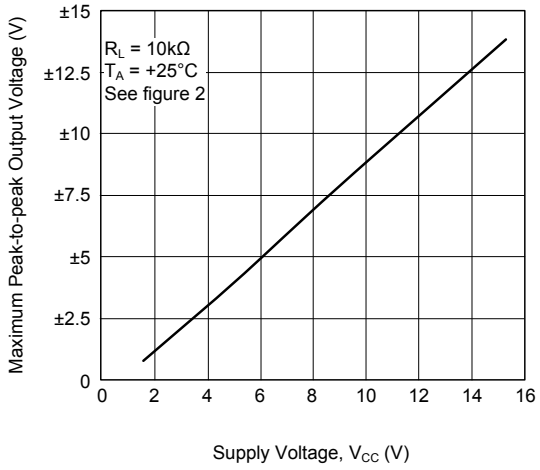


Gain-of-10 Inverting Amplifier

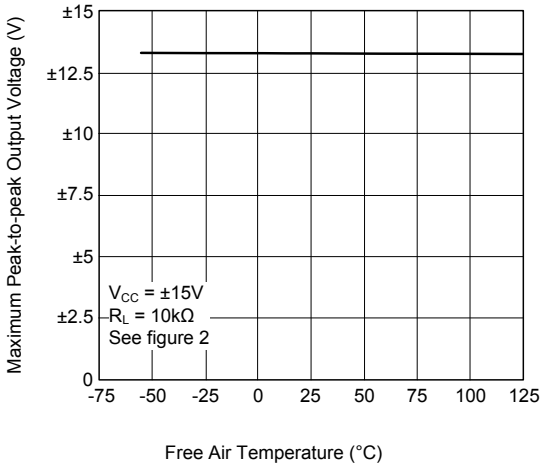


■ TYPICAL CHARACTERISTICS

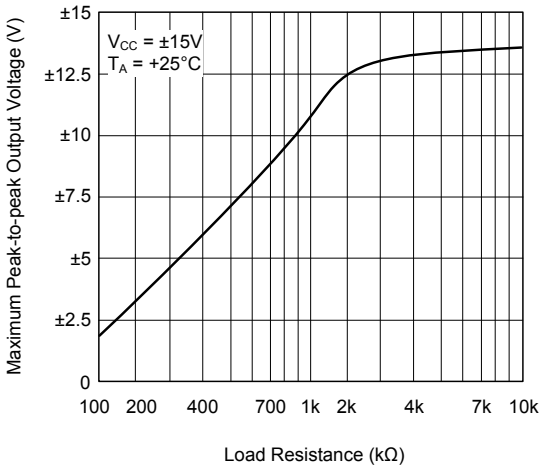
Maximum Peak-to-Peak Output Voltage vs. Supply Voltage



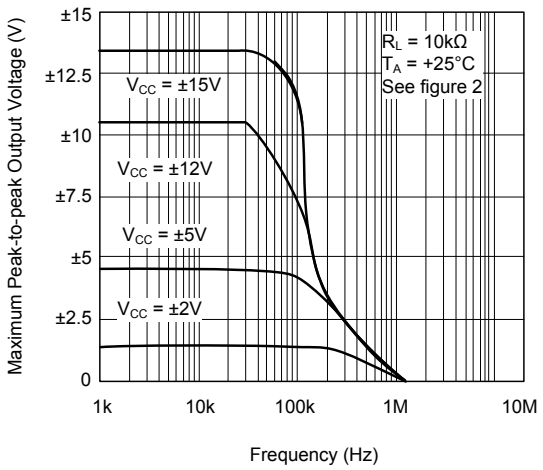
Maximum Peak-to-Peak Output Voltage vs. Free Air Temp.



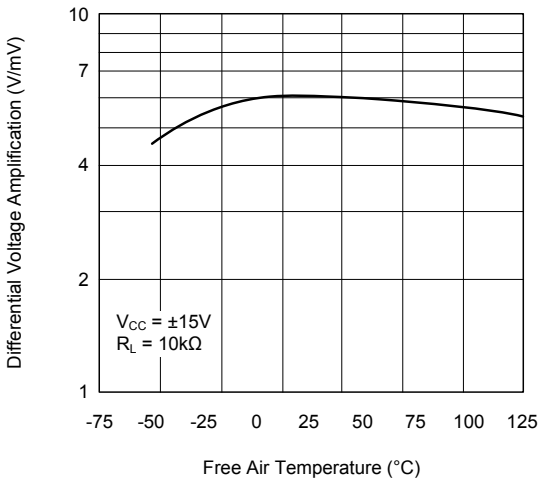
Maximum Peak-to-Peak Output Voltage vs. Load Resistance



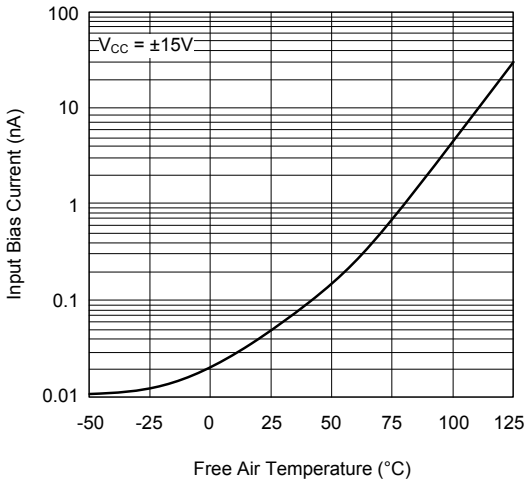
Maximum Peak-to-Peak Output Voltage vs. Frequency



Differential Voltage Amplification vs. Free Air Temperature

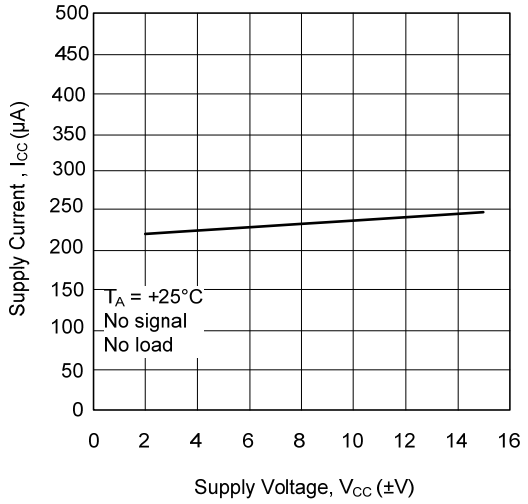


Input Bias Current vs. Free Air Temperature

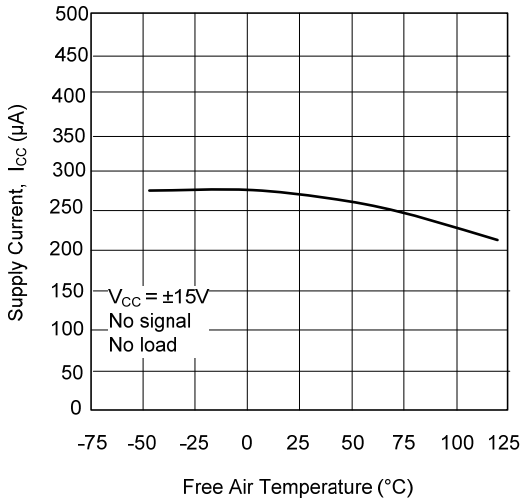


■ TYPICAL CHARACTERISTICS (Cont.)

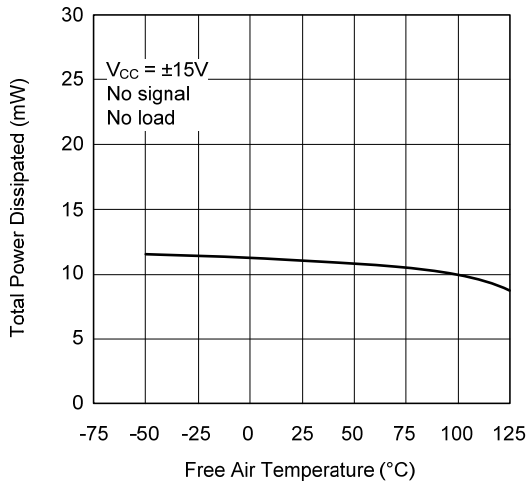
Supply Current Per Amplifier vs. Supply Voltage



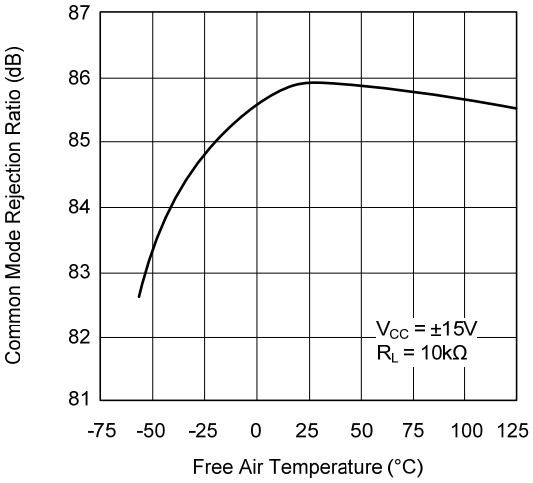
Supply Current Per Amplifier vs. Free Air Temperature



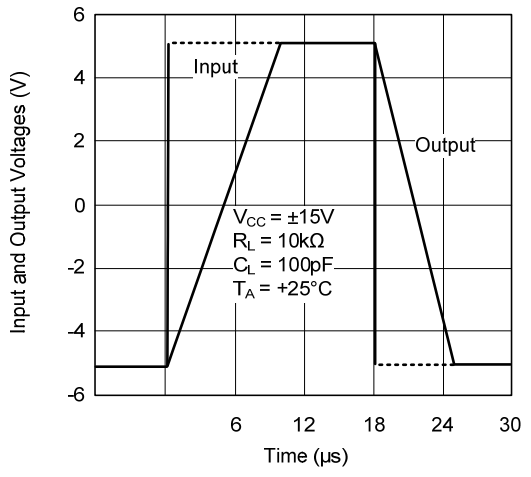
Total Power Dissipated vs. Free Air Temperature



Common Mode Rejection Ratio vs. Free Air Temperature



Voltage Follower Large Signal Pulse Response



Output Voltage vs. Elapsed Time