



TL082

LINEAR INTEGRATED CIRCUIT

GENERAL PURPOSE DUAL J-FET OPERATIONAL AMPLIFIER

DESCRIPTION

The UTC **TL082** 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 current, and low offset voltage temperature coefficient.

FEATURES

- * Low input bias and offset current
- * Wide common-mode (up to V_{CC}^+) and differential voltage range
- * Output short-circuit protection
- * High input impedance J-FET input stage
- * Internal frequency compensation
- * Latch up free operation
- * High slewrate: 16V/ μ s (typ.)

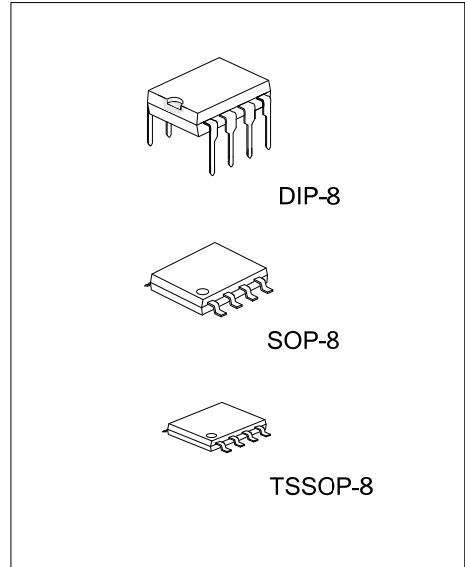
ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
TL082L-D08-T	TL082G-D08-T	DIP-8	Tube
TL082L-S08-R	TL082G-S08-R	SOP-8	Tape Reel
TL082L-P08-R	TL082G-P08-R	TSSOP-8	Tape Reel

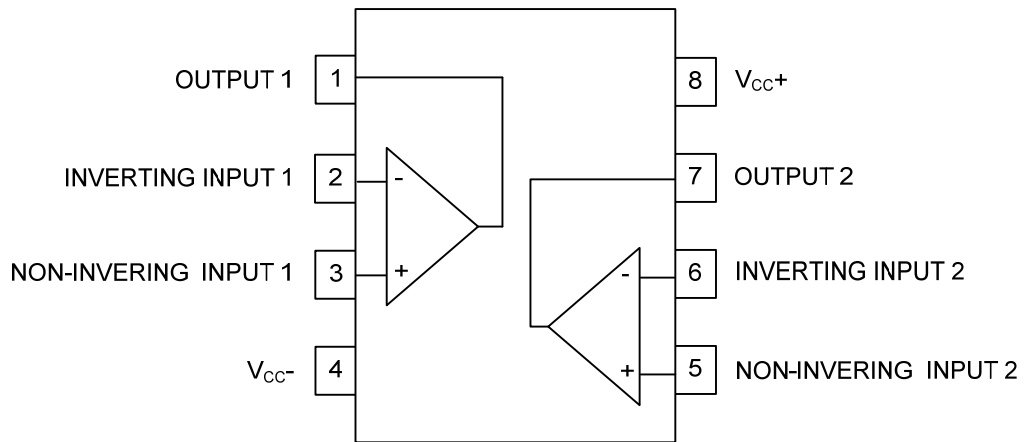
<p>TL082G-D08-T</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) D08: DIP-8, S08: SOP-8, P08: TSSOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

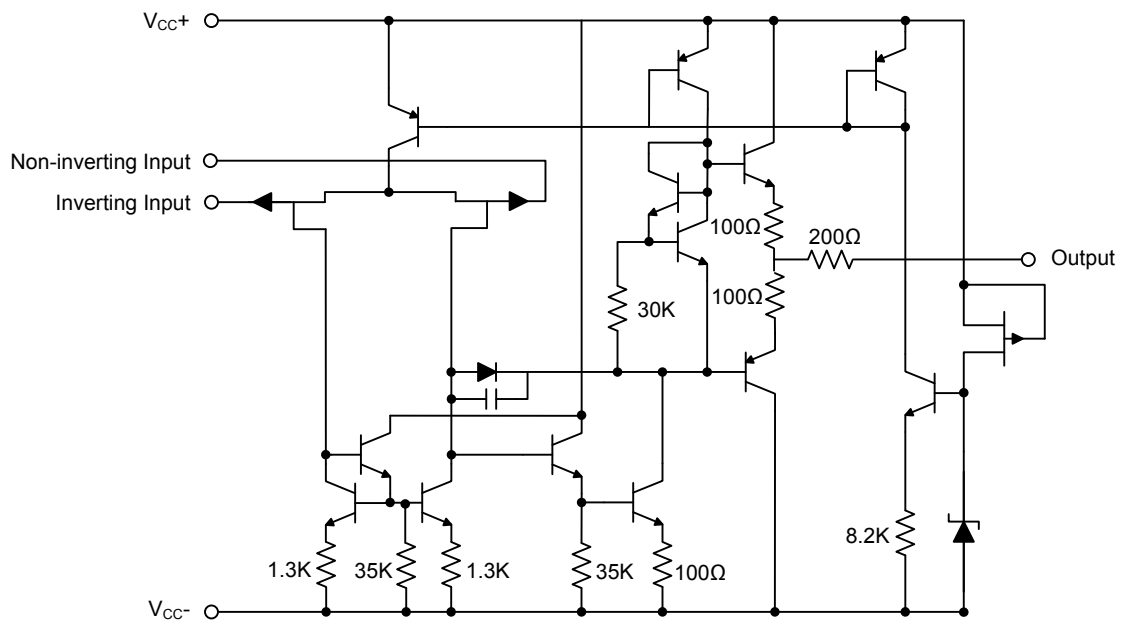
DIP-8	SOP-8	TSSOP-8
<p>UTC □□□□ → Date Code</p> <p>L: Lead Free</p> <p>G: Halogen Free</p> <p>□□ → Lot Code</p>	<p>UTC □□□□ → Date Code</p> <p>L: Lead Free</p> <p>G: Halogen Free</p> <p>□□ → Lot Code</p>	<p>UTC □□□□ → Date Code</p> <p>L: Lead Free</p> <p>G: Halogen Free</p> <p>□□ → Lot Code</p>



■ PIN CONFIGURATION



■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING ($T_A=25^{\circ}\text{C}$, 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_{ID}	± 30	V
Power Dissipation	SOP-8	440	mW
	DIP-8	625	mW
	TSSOP-8	360	mW
Output Short-Circuit Duration (Note 5)		Infinite	
Operating Temperature	T_{OPR}	$-40 \sim +125$ (Note 6)	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	$-65 \sim +150$	$^{\circ}\text{C}$

- 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.
6. It is guarantee by design, not 100% be tested.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-8	125	$^{\circ}\text{C/W}$
	DIP-8	85	$^{\circ}\text{C/W}$
	TSSOP-8	120	$^{\circ}\text{C/W}$
Junction to Case	SOP-8	40	$^{\circ}\text{C/W}$
	DIP-8	41	$^{\circ}\text{C/W}$
	TSSOP-8	37	$^{\circ}\text{C/W}$

■ ELECTRICAL CHARACTERISTICS ($V_{CC}=\pm 15V$, $T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage ($R_S=50\Omega$)	V_{IO}	$T_A=25^\circ C$		3	10	mV
		$T_{MIN} \leq T_A \leq T_{MAX}$			13	
Input Offset Voltage Drift	D_{VIO}			10		$\mu V/^\circ C$
Input Offset Current (Note)	I_{IO}	$T_A=25^\circ C$		5	100	pA
		$T_{MIN} \leq T_A \leq T_{MAX}$			10	nA
Input Bias Current (Note)	I_{IB}	$T_A=25^\circ C$		20	400	pA
		$T_{MIN} \leq T_A \leq T_{MAX}$			20	nA
Input Common Mode Voltage Range	V_{ICM}		± 11	-12~+15		V
Output Voltage Swing	$V_{O(SW)}$	$T_A=25^\circ C$, $R_L=2k\Omega$,	± 10	± 12		V
		$T_A=25^\circ C$, $R_L=10k\Omega$	± 12	± 13.5		V
		$T_{MIN} \leq T_A \leq T_{MAX}$, $R_L=2k\Omega$	± 10			V
		$T_{MIN} \leq T_A \leq T_{MAX}$, $R_L=10k\Omega$	± 12			V
Large Signal Voltage Gain ($R_L=2k\Omega$, $V_{OUT}=\pm 10V$)	Avd	$T_A=25^\circ C$	25	200		V/mV
		$T_{MIN} \leq T_A \leq T_{MAX}$	15			
Gain Bandwidth Product ($T_A=25^\circ C$)	GBP	$V_{IN}=10mV$, $R_L=2k\Omega$, $C_L=100pF$, $f=100kHz$	2.5	4		MHz
Input Resistance	R_i			10^{12}		Ω
Common Mode Rejection Ratio ($R_S=50\Omega$)	CMR	$T_A=25^\circ C$	70	86		dB
		$T_{MIN} \leq T_A \leq T_{MAX}$	70			
Supply Voltage Rejection Ratio ($R_S=50\Omega$)	SVR	$T_A=25^\circ C$	70	86		dB
		$T_{MIN} \leq T_A \leq T_{MAX}$	70			
Supply Current, No Load	I_{CC}	$T_A=25^\circ C$		2.3	5.6	mA
Channel Separation ($A_v=100$, $T_A=25^\circ C$)	V_{O1}/V_{O2}			120		dB
Output Short-Circuit Current	I_{OS}	$T_A=25^\circ C$	10	40	60	mA
		$T_{MIN} \leq T_A \leq T_{MAX}$	10		60	mA
Slew Rate ($T_A=25^\circ C$)	SR	$V_{IN}=10V$, $R_L=2k\Omega$ $C_L=100pF$, unity gain	6	10		V/ μs
Rise Time ($T_A=25^\circ C$)	t_R	$V_{IN}=20mV$, $R_L=2k\Omega$ $C_L=100pF$, unity gain		0.1		μs
Overshoot ($T_A=25^\circ C$)	K_{OV}	$V_{IN}=20mV$, $R_L=2k\Omega$ $C_L=100pF$, unity gain		10		%
Total Harmonic Distortion ($T_A=25^\circ C$)	THD	$A_v=20dB$, $f=1kHz$, $R_L=2k\Omega$, $C_L=100pF$, $V_{OUT}=2V_{pp}$)		0.01		%
Phase Margin	ϕ_m			45		Degree s
Equivalent Input Noise Voltage ($R_S=100\Omega$, $f=1kHz$)	eN			15		$\frac{nV}{\sqrt{Hz}}$

Note: The Input bias currents are junction leakage currents, which approximately double for every $10^\circ C$ increase in the junction temperature.

PARAMETER MEASUREMENT INFORMATION

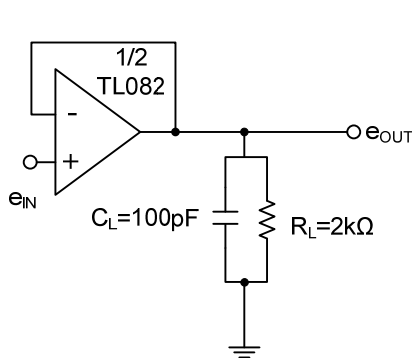


Figure 1. Voltage Follower

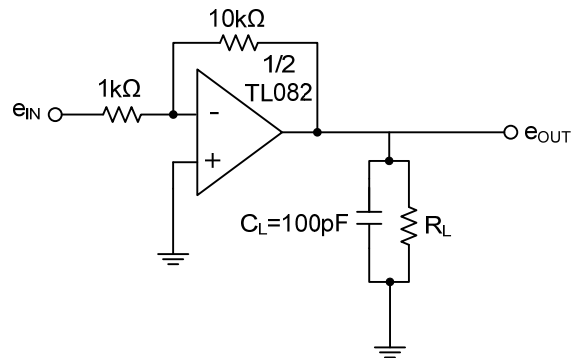
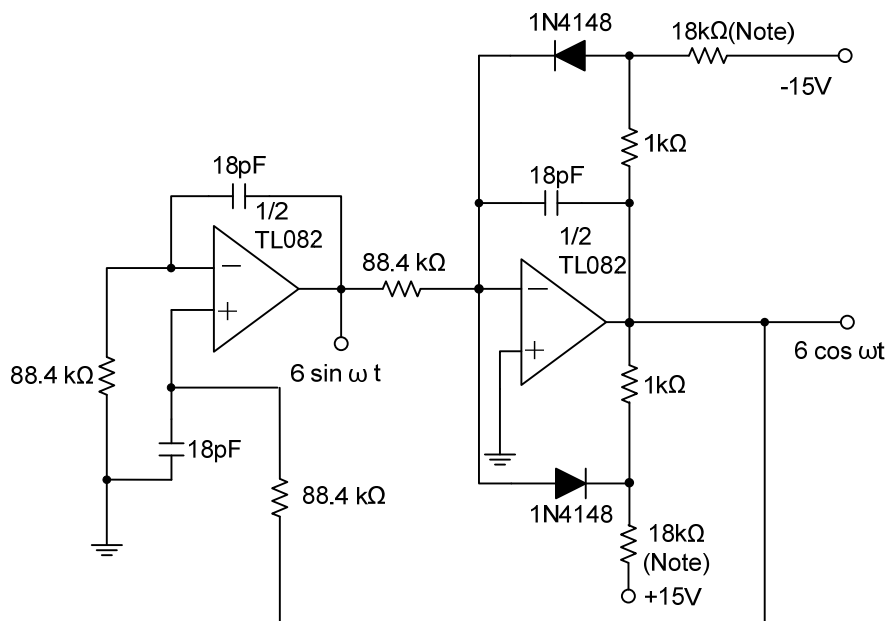


Figure 2. Gain-of-10 Inverting Amplifier

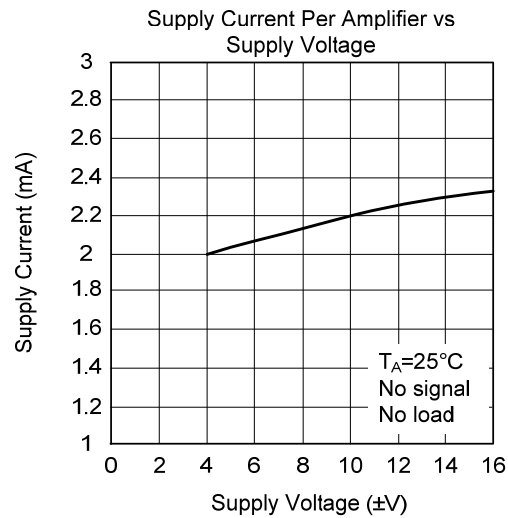
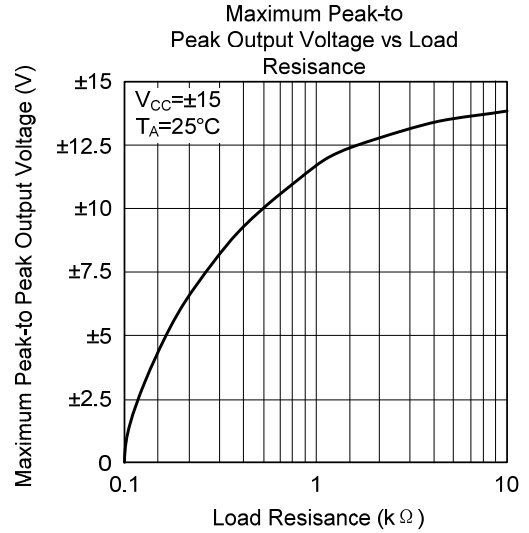
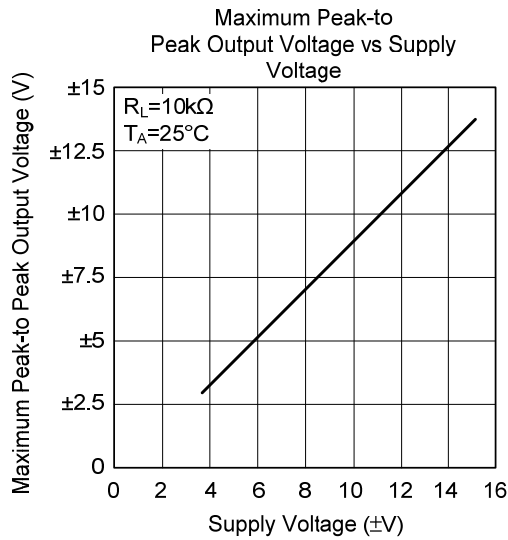
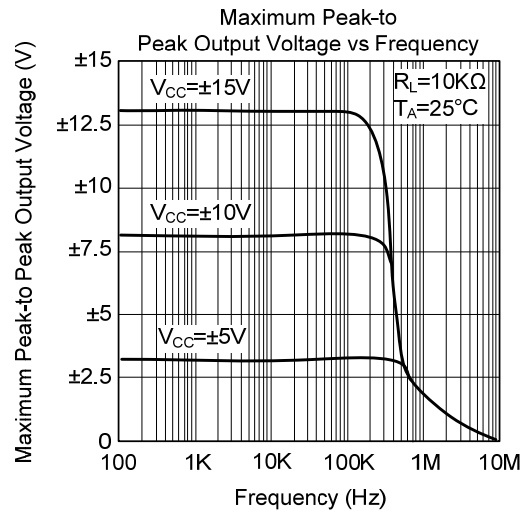
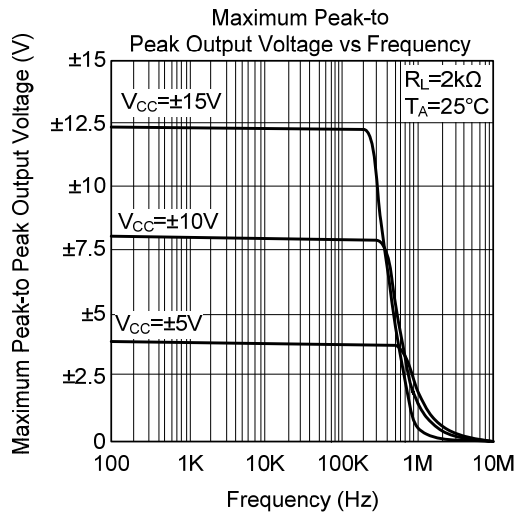
TYPICAL APPLICATION CIRCUIT

100 KHz Quadruple Oscillators



Note: These resistors values may be adjusted for a symmetrical output

■ TYPICAL CHARACTERISTICS



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.