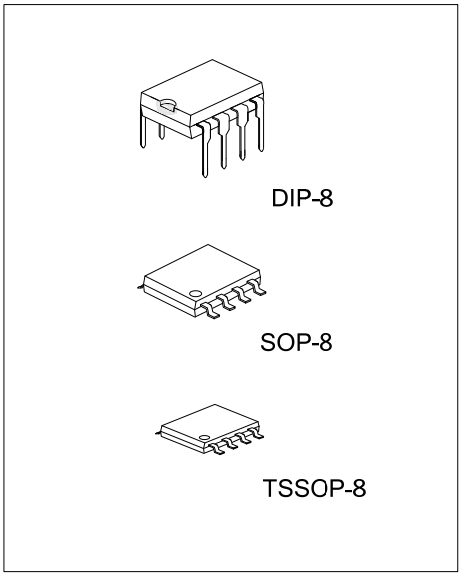
TL082

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/μs (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

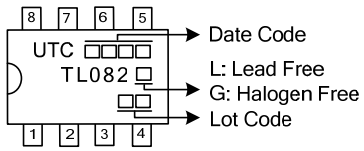
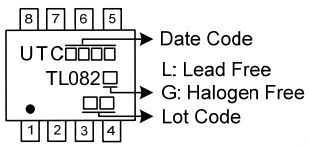
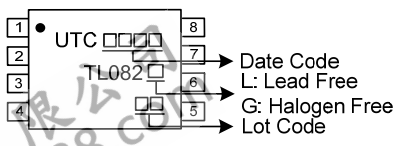
TL082G-D08-T

(1)Packing Type — (1) T: Tube, R: Tape Reel

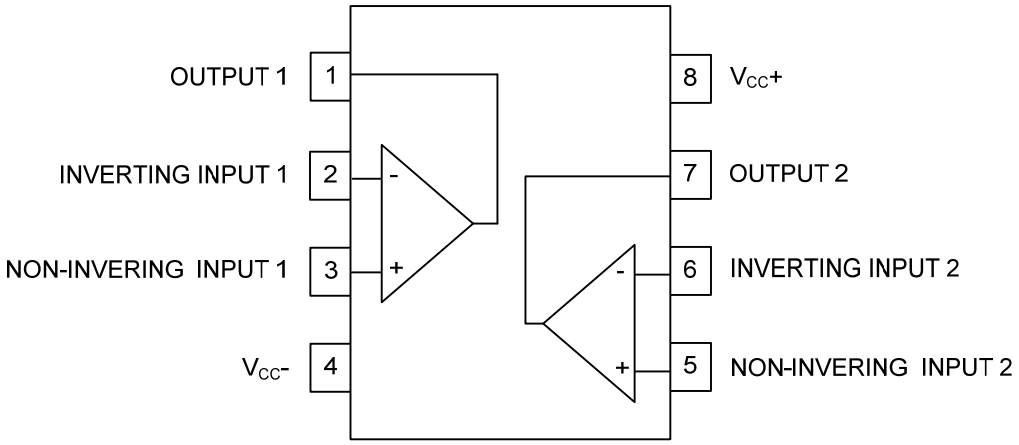
(2)Package Type — (2) D08: DIP-8, S08: SOP-8, P08: TSSOP-8

(3)Green Package — (3) G: Halogen Free and Lead Free, L: Lead Free

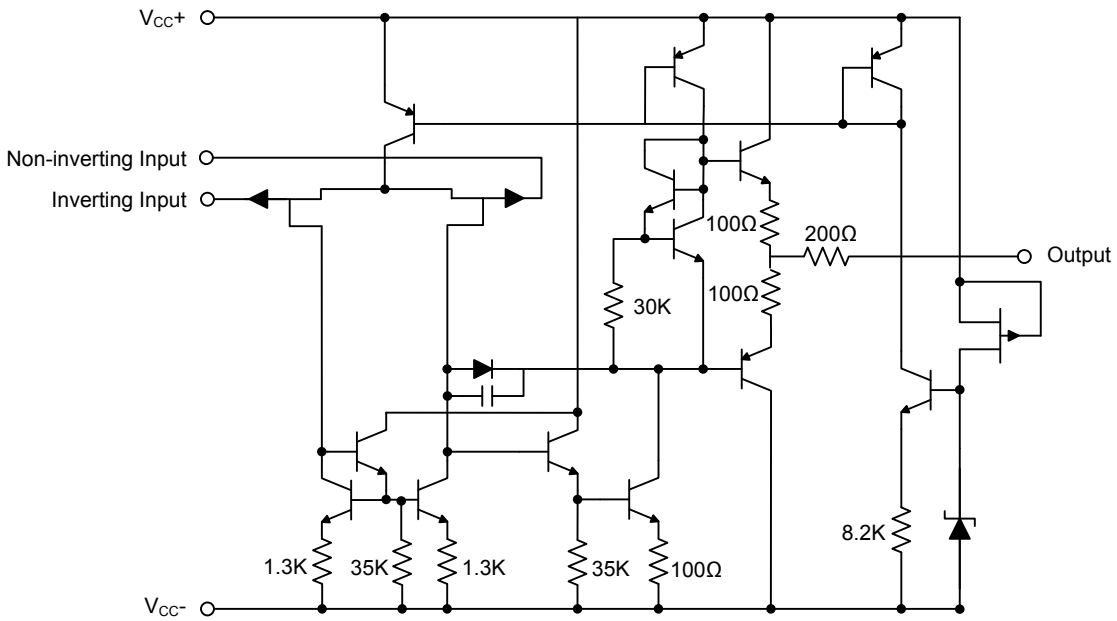
■ MARKING

DIP-8	SOP-8	TSSOP-8
		

■ PIN CONFIGURATION



■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (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_{ID}	±30	V
Power Dissipation	P_D	680	mW
Output Short-Circuit Duration (Note 5)		Infinite	
Operating Temperature	T_{OPR}	-20 ~ +85	°C
Storage Temperature Range	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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-8	θ_{JA}	125	°C/W
	DIP-8		85	°C/W
	TSSOP-8		120	°C/W
Junction to Case	SOP-8	θ_{JC}	40	°C/W
	DIP-8		41	°C/W
	TSSOP-8		37	°C/W

■ ELECTRICAL CHARACTERISTICS

(V_{CC}=±15V, T_A=25°C, T_{MIN}=0°C, T_{MAX}=70°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage (R_S=50Ω)	V_{IO}	T_A=25°C		3	10	mV
		$T_{MIN} \le T_A \le T_{MAX}$			13	
Input Offset Voltage Drift	D_{VIO}			10		μV/°C
Input Offset Current (Note)	I_{IO}	T_A=25°C		5	100	pA
		$T_{MIN} \le T_A \le T_{MAX}$			10	nA
Input Bias Current (Note)	I_{IB}	T_A=25°C		20	400	pA
		$T_{MIN} \le T_A \le T_{MAX}$			20	nA
Input Common Mode Voltage Range	V_{ICM}		±11	-12~+15		V
Output Voltage Swing	$\pm V_{OPP}$	T_A=25°C, R_L=2kΩ,	10	12		V
		T_A=25°C, R_L=10kΩ	12	13.5		V
		$T_{MIN} \le T_A \le T_{MAX}$, R_L=2kΩ	10			V
		$T_{MIN} \le T_A \le T_{MAX}$, R_L=10kΩ	12			V
Large Signal Voltage Gain (R_L=2kΩ, V_{OUT}=±10V)	Avd	T_A=25°C	25	200		V/mV
		$T_{MIN} \le T_A \le T_{MAX}$	15			
Gain Bandwidth Product (Ta=25°C)	GBP	V_{IN}=10mV, R_L=2kΩ, C_L=100pF, f=100kHZ	2.5	4		MHz
Input Resistance	R_I			10^{12}		Ω
Common Mode Rejection Ratio (R_S=50Ω)	CMR	T_A=25°C	70	86		dB
		$T_{MIN} \le T_A \le T_{MAX}$	70			
Supply Voltage Rejection Ratio (R_S=50Ω)	SVR	T_A=25°C	70	86		dB
		$T_{MIN} \le T_A \le T_{MAX}$	70			

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Current, No Load	I_{CC}	T_A=25°C		2.3	5.6	mA
Channel Separation (Av=100, T_a=25°C)	V_{01}/V_{02}			120		dB
Output Short-Circuit Current	I_{OS}	T_A=25°C	10	40	60	mA
		$T_{MIN} \le T_A \le T_{MAX}$	10		60	mA
Slew Rate (T_a=25°C)	SR	V_{IN}=10V, R_L=2kΩ C_L=100pF, unity gain	8	16		V/μs
Rise Time (T_a=25°C)	t_R	V_{IN} =20mV, R_L=2kΩ C_L=100pF, unity gain		0.1		μs
Overshoot (T_a=25°C)	K_{OV}	V_{IN}=20mV, R_L=2kΩ C_L=100pF, unity gain		10		%
Total Harmonic Distortion (T_a=25°C)	THD	A_V=20dB, f=1kHz, R_L=2kΩ, C_L=100pF, V_{OUT}=2Vpp)		0.01		%
Phase Margin	Φm			45		Degrees
Equivalent Input Noise Voltage (R_S=100Ω, f=1KHz)	eN			15		$\frac{nV}{\sqrt{Hz}}$

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

■ PARAMETER MEASUREMENT INFORMATION

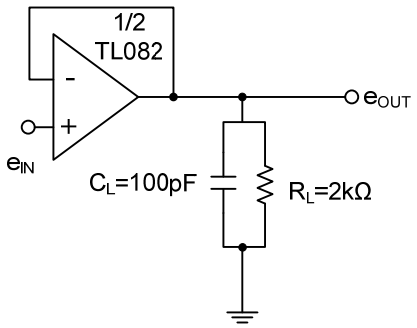


Figure 1. Voltage Follower

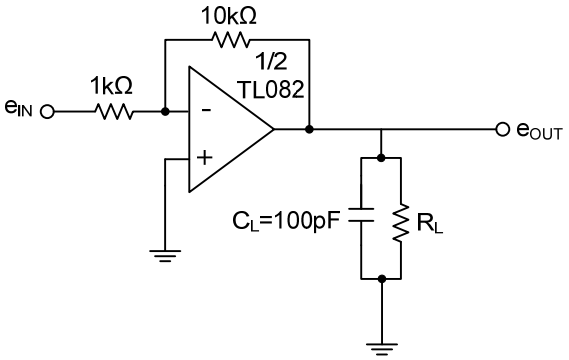
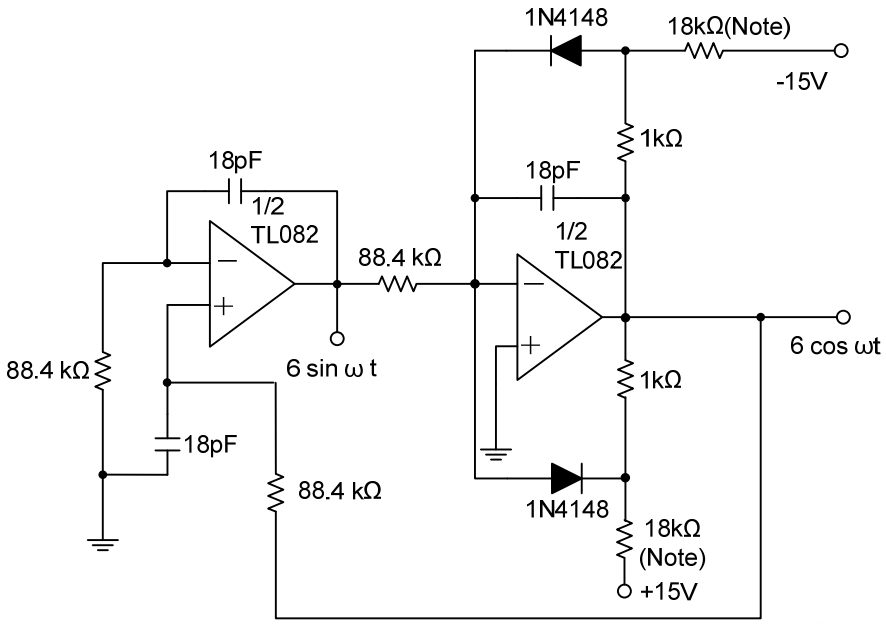


Figure 2. Gain-of-10 Inverting Amplifier

■ TYPICAL APPLICATION CIRCUIT

100 KHz Quadruple Oscillators



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

■ TYPICAL CHARACTERISTICS