

## GENERAL PURPOSE DUAL J-FET OPERATIONAL AMPLIFIER

### ■ Description

The TTESEMI 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.

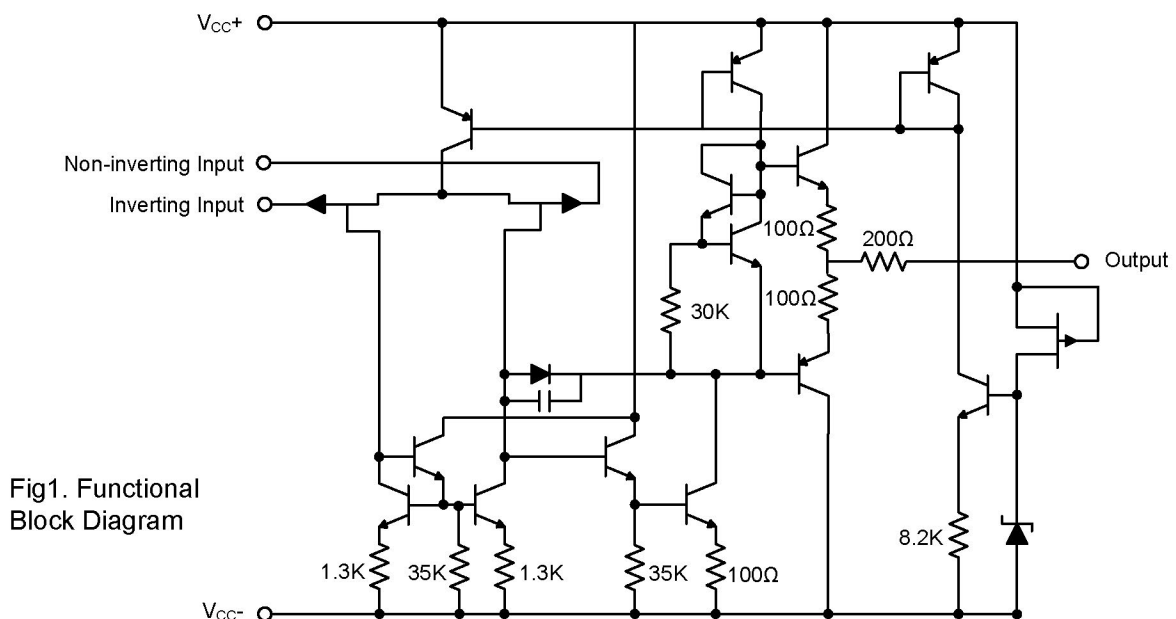
### ■ Features

- \* 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:  $10V/\mu s$  (typ.)

### ■ Applications

- White Goods (Refrigerators, Washing Machines)
- Hand-held Monitoring Systems
- Configuration Control and Print Support
- Transducer Interfaces
- Battery-Powered Applications

### ■ Functional Block Diagram



**Ordering Information**

Part Number	Package	Packing	Temperature(TA)	Package Qty	Remark
TLC082CDR	SOIC-8	Reel	0°C~70°C	2500	
TLC082IDR	SOIC-8	Reel	-40°C~85°C	2500	

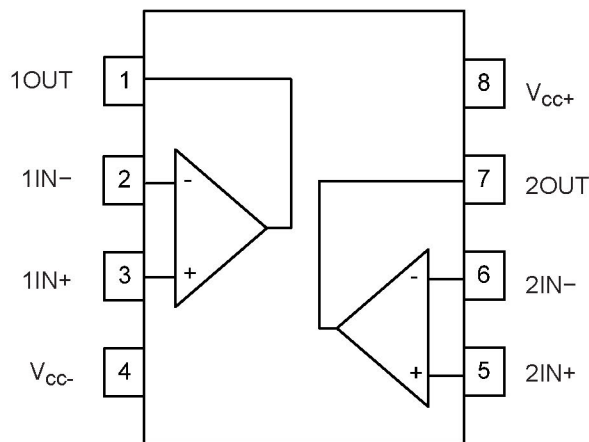
**Pin Assignment**


Fig2. SOIC-8 Package

**Pin Description**

NAME	PIN	I/O	DESCRIPTION
1IN+	3	I	Non-inverting input, Channel 1
1IN-	2	I	Inverting input, Channel 1
1OUT	1	O	Output, Channel 1
2IN+	5	I	Non-inverting input, Channel 2
2IN-	6	I	Inverting input, Channel 2
2OUT	7	O	Output, Channel 2
V <sub>cc+</sub>	8	—	Positive (highest) supply
V <sub>cc-</sub>	4	—	Negative (lowest) supply

## ■ ABSOLUTE MAXIMUM RATINGS

(TA=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage (Note 2)		V <sub>CC</sub>	±18	V
Input Voltage (Note 3)		V <sub>IN</sub>	±15	V
Differential Input Voltage (Note 4)		V <sub>ID</sub>	±30	V
Power Dissipation	SOP-8	P <sub>D</sub>	440	mW
Output Short-Circuit Duration (Note 5)			Infinite	
Operating Temperature		T <sub>OPR</sub>	-40 ~ +125 (Note 6)	°C
Storage Temperature Range		T <sub>STG</sub>	-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<sub>CC-</sub> and V<sub>CC+</sub>.
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	θ <sub>JA</sub>	125	°C/W
Junction to Case	SOP-8	θ <sub>JC</sub>	40	°C/W

**■ Electrical Characteristics**

(VCC=±15V, TA=25 °C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage (RS=50Ω)	IO	TA=25°C		3	10	mV
		TMIN ≤ TA ≤ TMAX			13	
Input Offset Voltage Drift	DVIO			10		μV/°C
Input Offset Current (Note)	IIO	TA=25°C		5	100	pA
		TMIN ≤ TA ≤ TMAX			10	nA
Input Bias Current (Note)	IIB	TA=25°C		20	400	pA
		TMIN ≤ TA ≤ TMAX			20	nA
Input Common Mode Voltage Range	VICM		±11	-12~+15		V
Output Voltage Swing	VO(SW)	TA=25°C, RL=2kΩ,	±1	±12		V
		TA=25°C, RL=10kΩ	±12	±13.5		V
		TMIN ≤ TA ≤ TMAX, RL=2kΩ	±10			V
		TMIN ≤ TA ≤ TMAX, RL=10kΩ	±12			V
Large Signal Voltage Gain (RL=2kΩ, VOUT=±10V)	Avd	TA=25°C		200		V/mV
		TMIN ≤ TA ≤ TMAX	15			
Gain Bandwidth Product (TA=25°C)	GBP	VIN=10mV, RL=2kΩ, CL=100pF, f=100KHZ	2.5	4		MHz
Input Resistance	RI			10 <sup>12</sup>		Ω
Common Mode Rejection Ratio (RS=50Ω)	CMR	TA=25°C		86		dB
		TMIN ≤ TA ≤ TMAX	70			
Supply Voltage Rejection Ratio (RS=50Ω)	SVR	TA=25°C		86		dB
		TMIN ≤ TA ≤ TMAX	70			
Supply Current, No Load	ICC	TA=25°C		2.3	5.6	mA
Channel Separation (AV=100, TA=25°C)	V01/V02			120		dB
Output Short-Circuit Current	IOS	TA=25°C	10	40	60	mA
		TMIN ≤ TA ≤ TMAX	10		60	mA
Slew Rate (TA=25°C)	SR	VIN=10V, RL=2kΩ CL=100pF, unity gain	6	10		V/μs
Rise Time (TA=25°C)	tr	VIN =20mV, RL=2kΩ CL=100pF, unity gain		0.1		μs
Overshoot (TA=25°C)	KOV	VIN=20mV, RL=2kΩ CL=100pF, unity gain		10		%
Total Harmonic Distortion (TA=25°C)	THD	AV=20dB, f=1kHz, RL=2kΩ, CL=100pF, VOUT=2Vpp)		0.01		%
Phase Margin	Φm			45		Degree s
Equivalent Input Noise Voltage (RS=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**

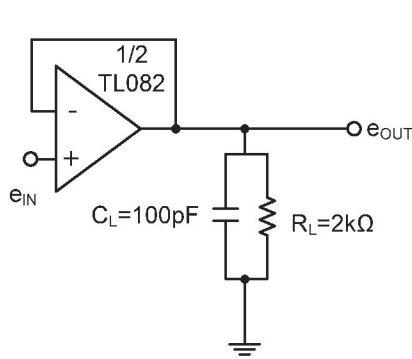


Figure 1. Voltage Follower

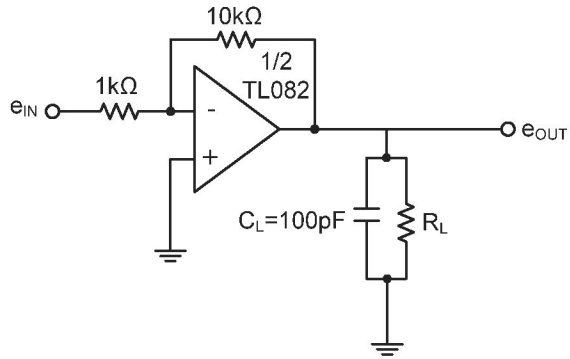
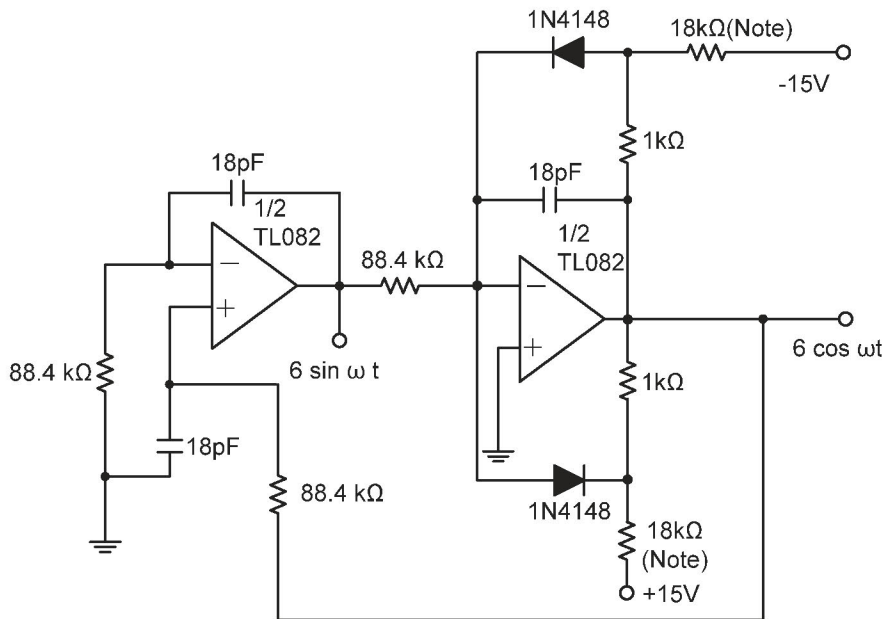


Figure 2. Gain-of-10 Inverting Amplifier

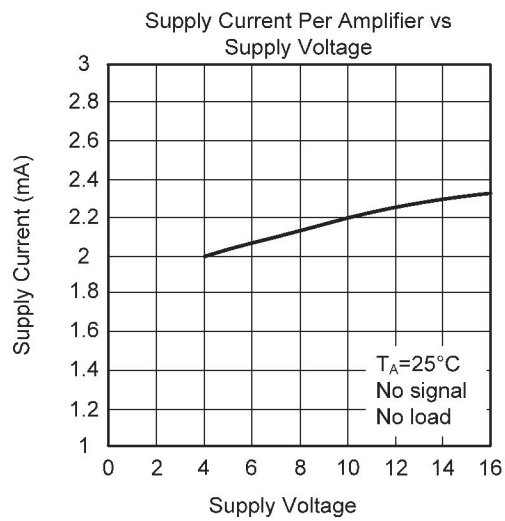
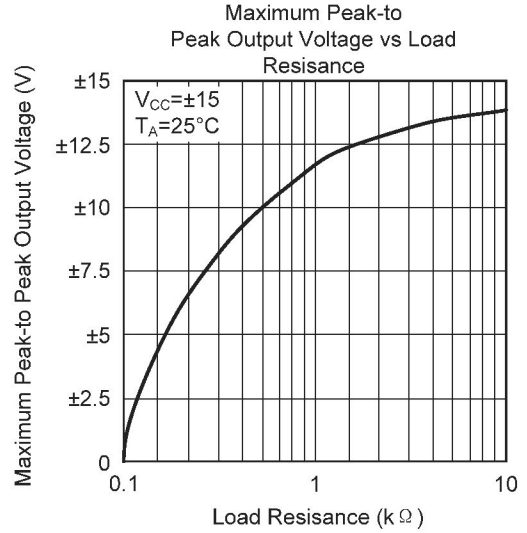
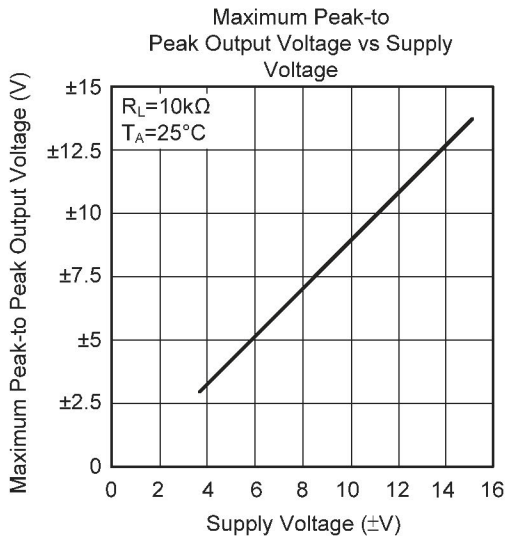
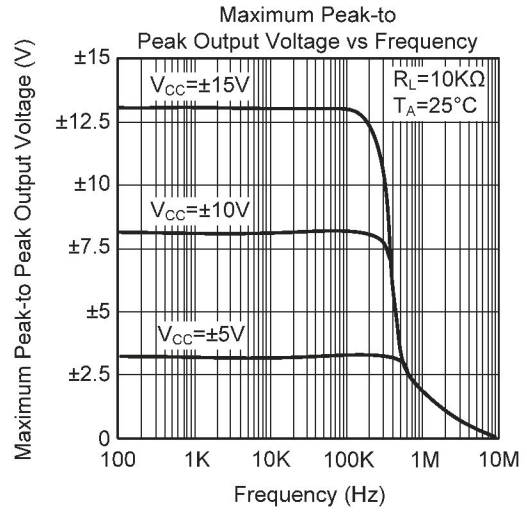
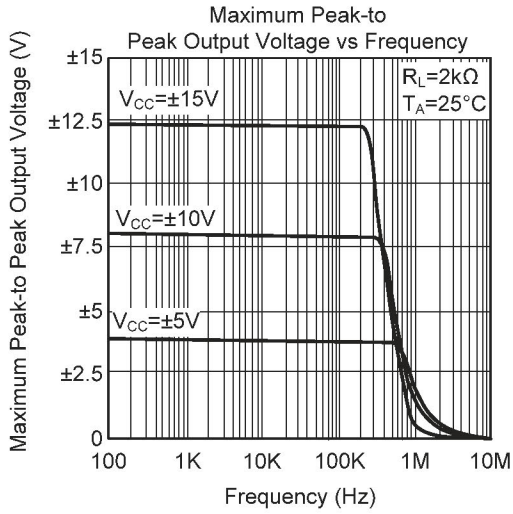
■ **TYPICAL APPLICATION CIRCUIT**

100 KHz Quadruple Oscillators

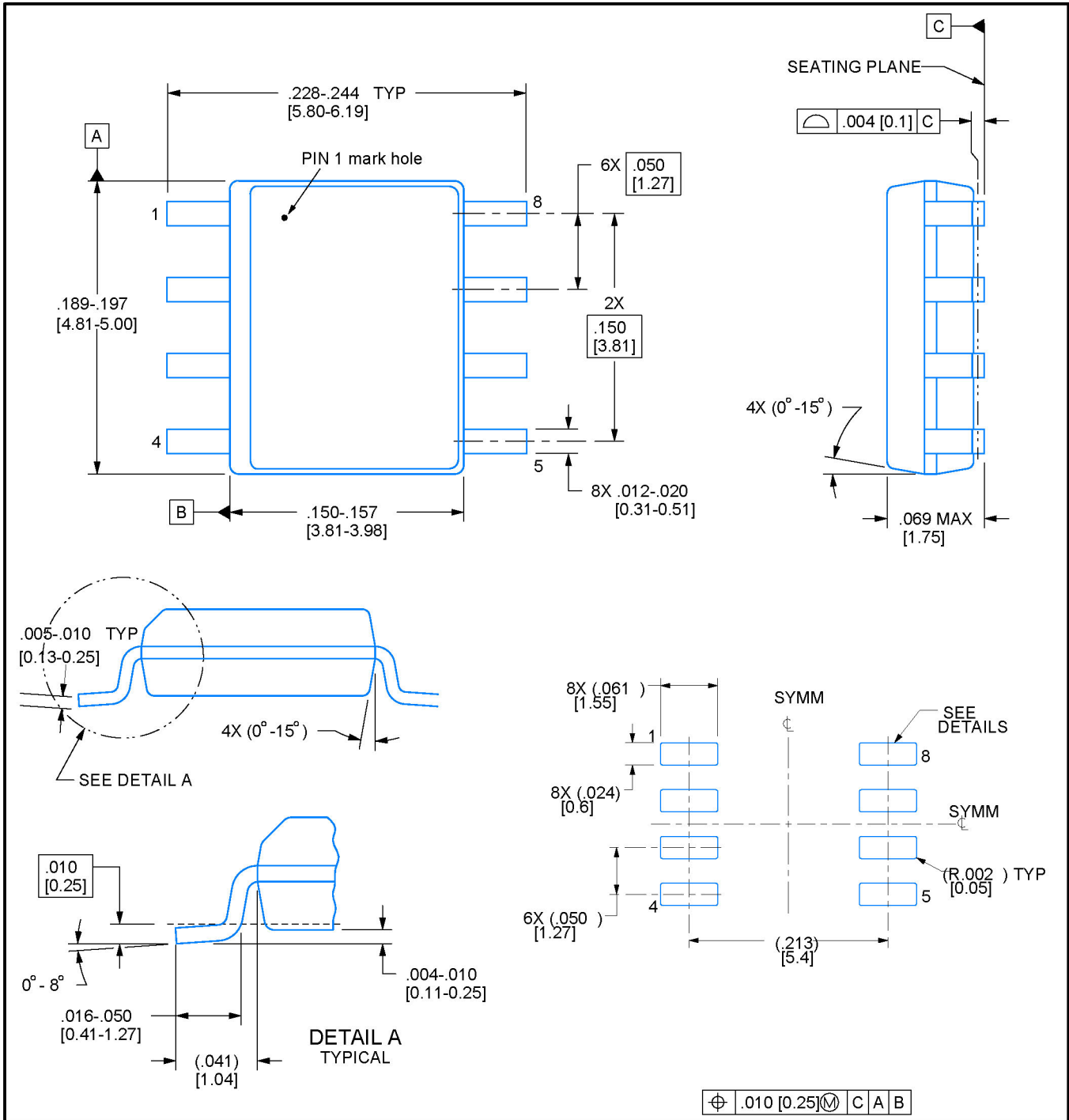


Note: These resistors values may be adjusted for a symmetrical output

■ **TYPICAL CHARACTERISTICS**



**PACKAGE OUTLINE SOIC - 8, 1.75 mm max height**



NOTES: Linear dimensions are in inches [millimeters]. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 [0.15] per side.