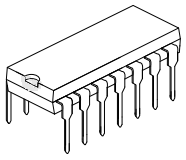
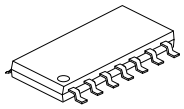
TL084

LINEAR INTEGRATED CIRCUIT

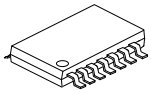
LOW NOISE QUAD J-FET OPERATIONAL AMPLIFIER



DIP-14



SOP-14



TSSOP-14

■ DESCRIPTION

The UTC **TL084** is a high speed J-FET input quad operational amplifier. It incorporates well matched, high voltage J-FET and bipolar transistors on a monolithic integrated circuit. The device features high slew rates, low input bias and offset current, and low offset voltage temperature coefficient.

■ FEATURES

*Low Power Consumption
*Wide Common-Mode (Up To V_{cc}+) and Differential Voltage Range
*Low Input Bias and Offset Current
*Low Noise eN = 15 $nV/\sqrt{Hz}$ (typ.)
*Output Short-Circuit Protection
*High Input Impedance J-FET Input Stage
*Low Harmonic Distortion: 0.01% (typ.)
*Internal Frequency Compensation
*Latch up Free Operation

■ ORDERING INFORMATION

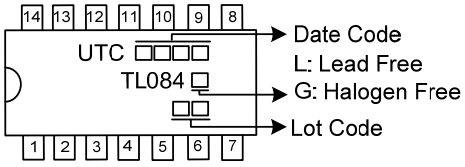
Ordering Number		Package	Packing
Lead Free	Halogen Free		
TL084L-D14-T	TL084G-D14-T	DIP-14	Tube
TL084L-P14-R	TL084G-P14-R	TSSOP-14	Tape Reel
TL084L-S14-R	TL084G-S14-R	SOP-14	Tape Reel

TL084G-D14-T
(1)Packing Type
(2)Package Type
(3)Green Package

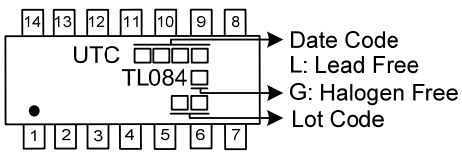
(1) T: Tube, R: Tape Reel
(2) D14: DIP-14, S14: SOP-14, P14: TSSOP-14
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

DIP-14

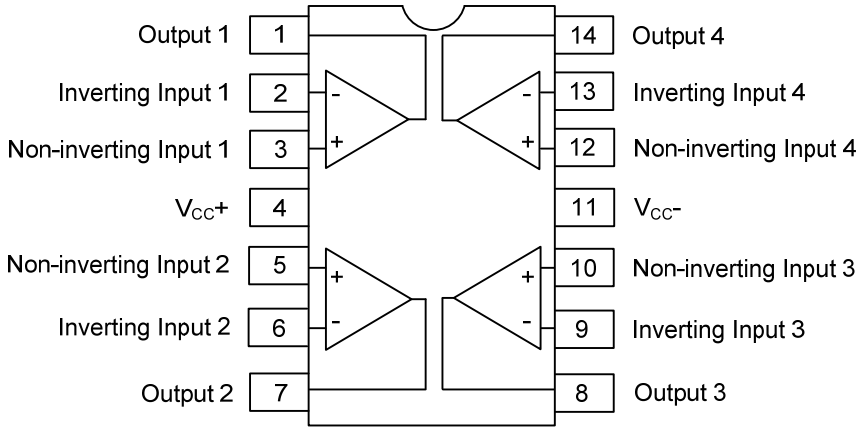


SOP-14 / TSSOP-14

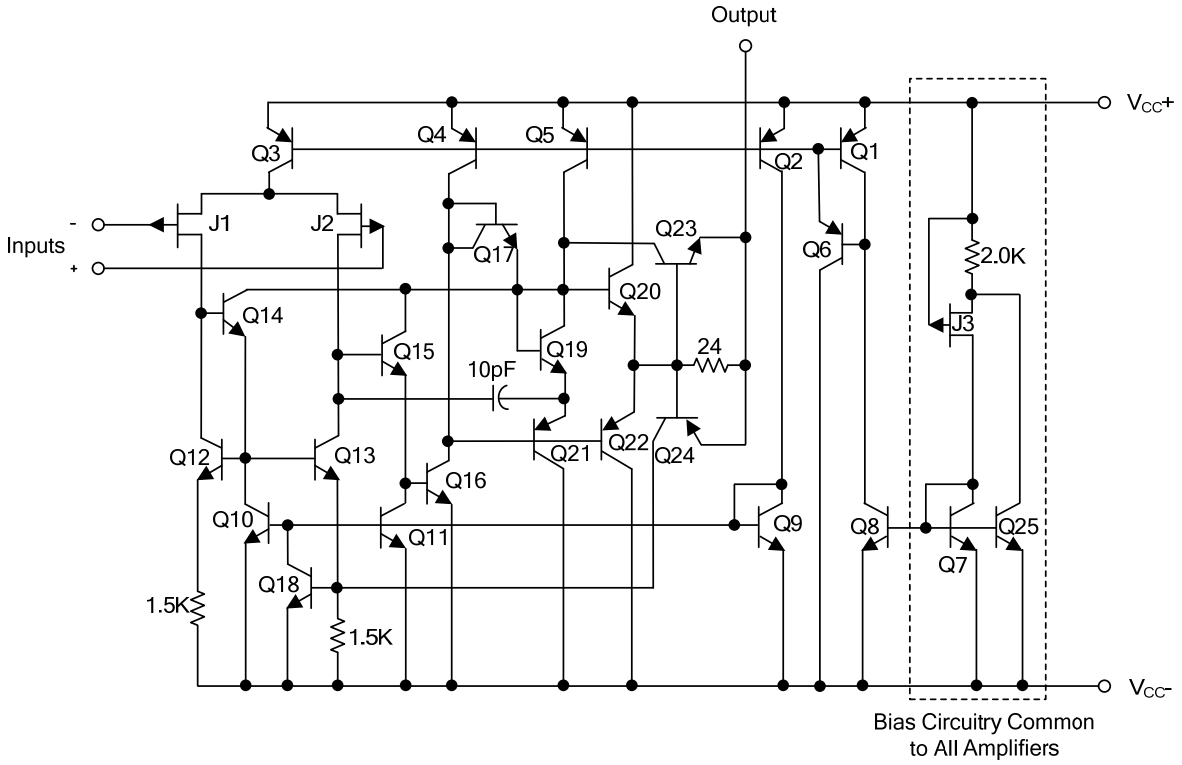


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■ PIN CONFIGURATIONS



■ SCHEMATIC DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

PARAMETER	SYMBOL	RATING	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	P_D	680	mW
Output Short-Circuit Duration (Note 5)		Infinite	
Operating Temperature	T_{OPR}	0 ~ +70	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

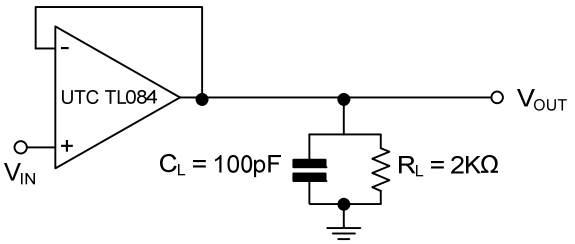
Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. All voltage values, except differential voltage, are with respect to the zero reference level (ground) 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)

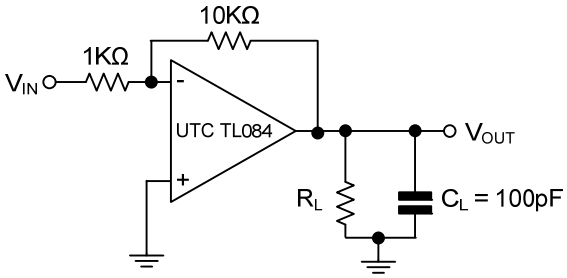
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	$V_{I(OFF)}$	$R_S \leqq 10k\Omega$, V_{CM}=0V		5	15	mV
Temperature Coefficient of Input Offset Voltage	$\Delta V_{I(OFF)}$	R_S=50Ω		10		μV/°C
Input Offset Current (Note)	$I_{I(OFF)}$	V_{CM}=0V		5	200	pA
Input Bias Current (Note1)	$I_{I(BIAS)}$	V_{CM}=0V		30	400	pA
Input Common Mode Voltage	$V_{I(CM)}$		±10	-12~+15		V
Output Voltage Swing	$V_{O(SW)}$	R_L=10kΩ	24	28		V
Large Signal Voltage Gain	G_V	$R_L \geqq 2k\Omega$, V_{OUT}=±10V	25	150		V/mV
Gain Bandwidth Product	GB_W			1		MHz
Input Resistance	R_{IN}			10^{12}		Ω
Common Mode Rejection Ratio	CMR	$R_S \leqq 10k\Omega$	70	100		dB
Supply Voltage Rejection Ratio	SVR	$R_S \leqq 10k\Omega$	70	100		dB
Supply Current	I_{CC}	No Load		1.4	2.8	mA
Channel Separation	V01/V02	G_V=100		120		dB
Slew Rate	SR	V_{IN}=10V, R_L=2kΩ, C_L=100pF, unity gain	2.0			V/μs
Rise Time	t_R			0.1		μs
Overshoot Factor	K_{OV}	V_{IN}=20mV, R_L=2kΩ, C_L=100pF, unity gain		10		%
Equivalent Input Noise Voltage	eN	R_S=100Ω, f=1KHz		25		$nV/\sqrt{Hz}$

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

■ PARAMETER MEASUREMENT INFORMATION



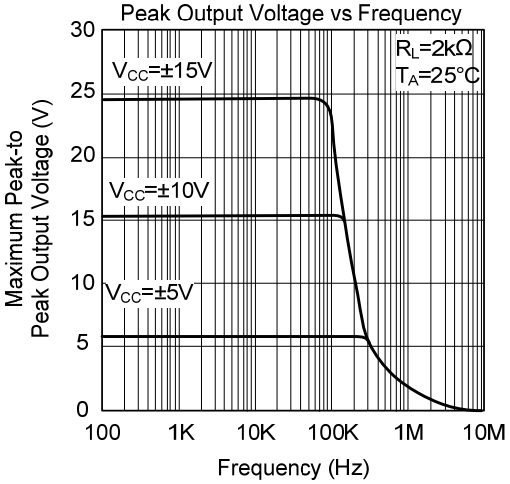
Voltage Follow



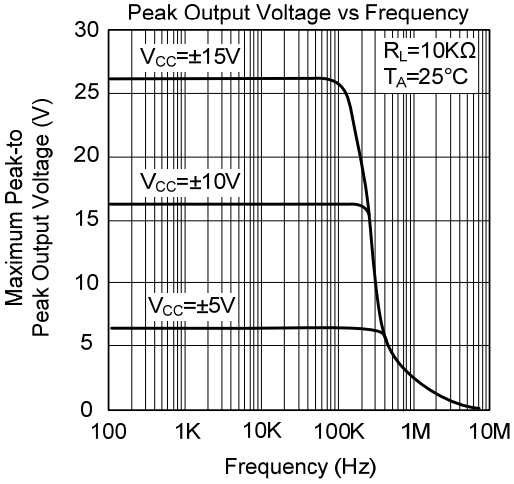
Gain-of-10 Inverting Amplifier

■ TYPICAL CHARACTERISTICS

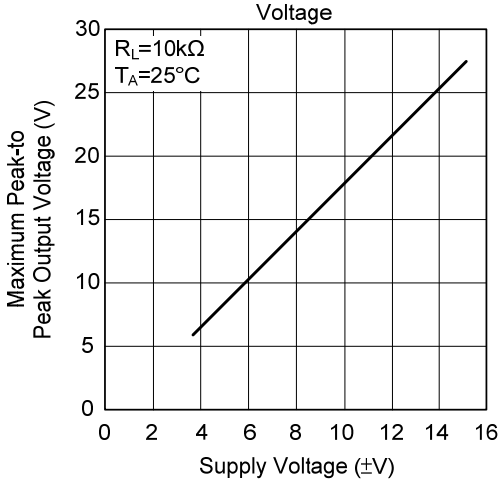
Maximum Peak-to Peak Output Voltage vs Frequency



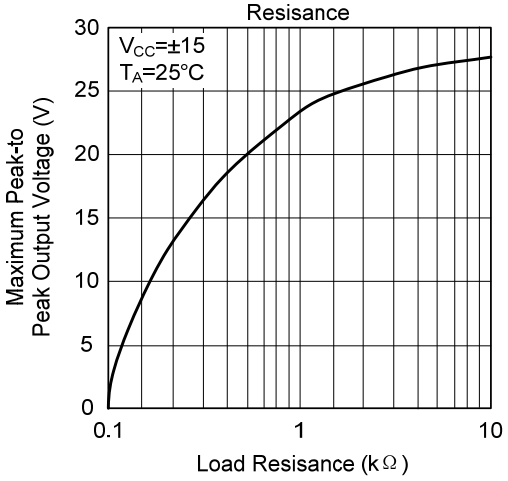
Maximum Peak-to Peak Output Voltage vs Frequency



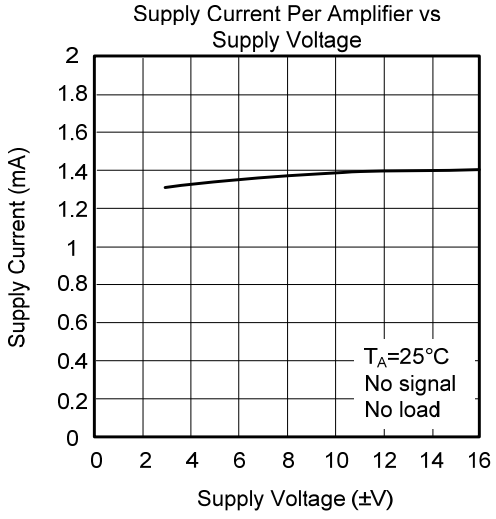
Maximum Peak-to Peak Output Voltage vs Supply Voltage



Maximum Peak-to Peak Output Voltage vs Load Resisance



Supply Current Per Amplifier vs Supply Voltage



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