

## DESCRIPTION

The RH108A is a precision operational amplifier particularly well-suited for high source impedance applications requiring low offset and bias currents and low power consumption.

The wafer lots are processed to Linear Technology's in-house Class S flow to yield circuits usable in stringent military applications.

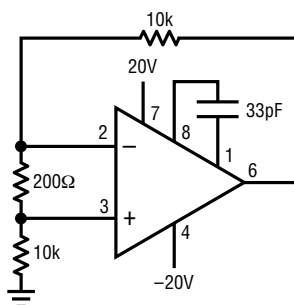
For complete electrical specifications, performance curves and applications information, see the LM108A/LM108 data sheet.

## ABSOLUTE MAXIMUM RATINGS

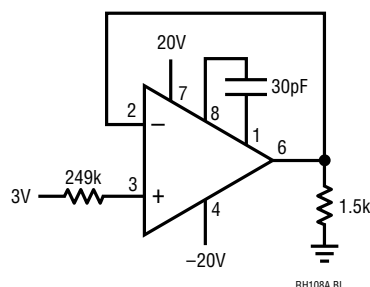
Supply Voltage .....	$\pm 20\text{V}$
Differential Input Current (Note 1) .....	$\pm 10\text{mA}$
Input Voltage (Note 2) .....	$\pm 15\text{V}$
Output Short-Circuit Duration .....	Indefinite
Operating Temperature Range .....	$-55^{\circ}\text{C}$ to $125^{\circ}\text{C}$
Storage Temperature Range .....	$-65^{\circ}\text{C}$ to $150^{\circ}\text{C}$
Lead Temperature (Soldering, 10 sec) .....	$300^{\circ}\text{C}$

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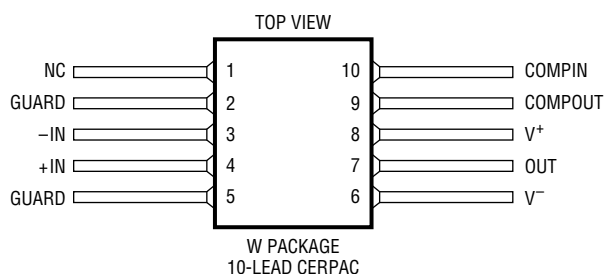
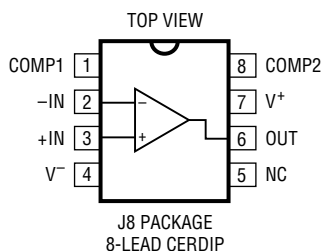
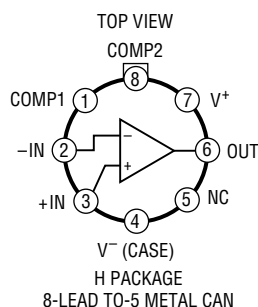
## BURN-IN CIRCUIT



OR



## PACKAGE INFORMATION



**TABLE 1: ELECTRICAL CHARACTERISTICS** (Preirradiation) (Note 4)

SYMBOL	PARAMETER	CONDITIONS	NOTES	$T_A = 25^\circ\text{C}$			SUB-GROUP	$-55^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$			SUB-GROUP	UNITS
				MIN	TYP	MAX		MIN	TYP	MAX		
$V_{OS}$	Input Offset Voltage					0.5	1			1.0	2,3	mV
$\frac{\Delta V_{OS}}{\Delta \text{Temp}}$	Average Tempco of Offset Voltage		3							5.0		$\mu\text{V}/^\circ\text{C}$
$I_{OS}$	Input Offset Current					0.2	1			0.4	2,3	nA
$\frac{\Delta I_S}{\Delta \text{Temp}}$	Average Tempco of Offset Current		3							2.5		$\text{pA}/^\circ\text{C}$
$I_B$	Input Bias Current					2.0	1			3.0	2,3	nA
$A_{VOL}$	Large-Signal Voltage Gain	$V_S = \pm 15\text{V}$ , $V_{OUT} = \pm 10\text{V}$ $R_L \geq 10\text{k}$		80			4	40			5,6	V/mV
CMRR	Common Mode Rejection Ratio			96			1	96			2,3	dB
PSRR	Power Supply Rejection Ratio			96			1	96			2,3	dB
	Input Voltage Range	$V_S = \pm 15\text{V}$	3	$\pm 13.5$				$\pm 13.5$				V
$V_{OUT}$	Output Voltage Swing	$V_S = \pm 15\text{V}$ , $R_L = 10\text{k}$		$\pm 13$			4	$\pm 13$			5,6	V
$R_{IN}$	Input Resistance		3	30								M $\Omega$
$I_S$	Supply Current	(Note 6)				0.6	1			0.4	2	mA

**TABLE 1A: ELECTRICAL CHARACTERISTICS** (Postirradiation) (Note 5)

SYMBOL	PARAMETER	CONDITIONS	NOTES	10KRAD(Si)		20KRAD(Si)		50KRAD(Si)		80KRAD(Si)		UNITS
				MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
$V_{OS}$	Input Offset Voltage				0.5		0.5		0.5		1.0	mV
$I_{OS}$	Input Offset Current				0.3		0.3		0.3		0.3	nA
$I_B$	Input Bias Current				$\pm 2.0$		$\pm 2.0$		$\pm 2.0$		$\pm 4.0$	nA
$A_{VOL}$	Large-Signal Voltage Gain	$V_S = \pm 15\text{V}$ , $V_{OUT} = \pm 10\text{V}$ $R_L \geq 10\text{k}$			98		98		90		86	dB
CMRR	Common Mode Rejection Ratio				96		96		84		70	dB
PSRR	Power Supply Rejection Ratio				96		96		84		70	dB
	Input Voltage Range		3	$\pm 13.5$		$\pm 13.5$		$\pm 13.5$		$\pm 13.5$		V
$V_{OUT}$	Output Voltage Swing			$\pm 13$		$\pm 13$		$\pm 13$		$\pm 13$		V
$R_{IN}$	Input Resistance		3	30		30		30		30		M $\Omega$
$I_S$	Supply Current				0.6		0.6		0.6		0.6	mA

**Note 1:** Differential input voltages greater than 1V will cause excessive current to flow through the input diodes unless limiting resistance is used.

**Note 2:** For supply voltages less than  $\pm 15\text{V}$ , the maximum input voltage is equal to the supply voltage.

**Note 3:** Guaranteed by design, characterization or correlation to other tested parameters.

**Note 4:**  $\pm 5\text{V} \leq V_S \leq \pm 20\text{V}$  unless otherwise noted.

**Note 5:**  $V_S = \pm 15\text{V}$ ,  $V_{CM} = 0\text{V}$ ,  $T_A = 25^\circ\text{C}$  unless otherwise noted.

**Note 6:**  $25^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$ .

## TABLE 2: ELECTRICAL TEST REQUIREMENTS

MIL-STD-883 TEST REQUIREMENTS	SUBGROUP
Final Electrical Test Requirements (Method 5004)	1*,2,3,4,5,6
Group A Test Requirements (Method 5005)	1,2,3,4,5,6
Group C and D End Point Electrical Parameters (Method 5005)	1

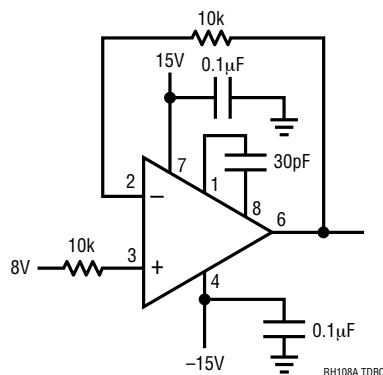
\* PDA Applies to subgroup 1. See PDA Test Notes.

### PDA Test Notes

The PDA is specified as 5% based on failures from group A, subgroup 1, tests after cooldown as the final electrical test in accordance with method 5004 of MIL-STD-883 Class B. The verified failures (including Delta parameters) of group A, subgroup 1, after burn-in divided by the total number of devices submitted for burn-in in that lot shall be used to determine the percent for the lot.

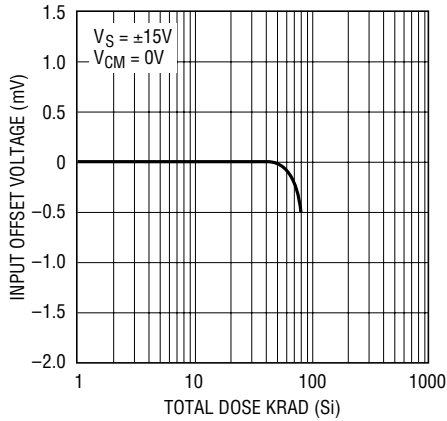
Linear Technology Corporation reserves the right to test to tighter limits than those given.

## TOTAL DOSE BIAS CIRCUIT



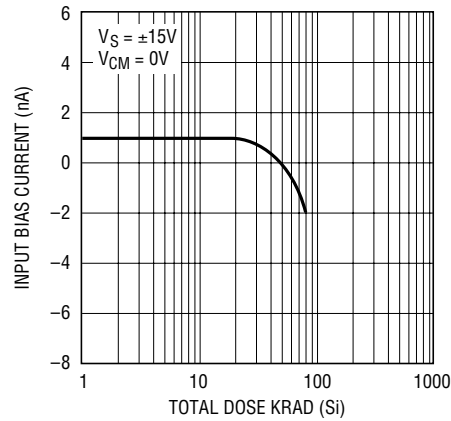
# TYPICAL PERFORMANCE CHARACTERISTICS

### Input Offset Voltage



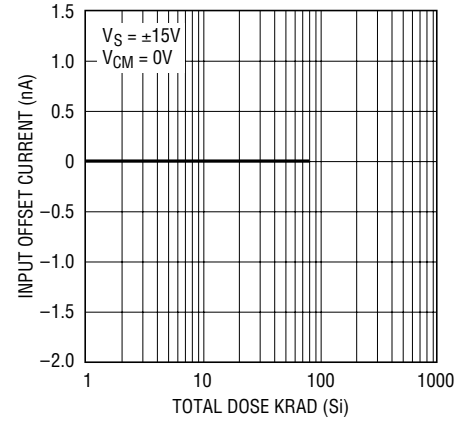
RH108A G01

### Input Bias Current



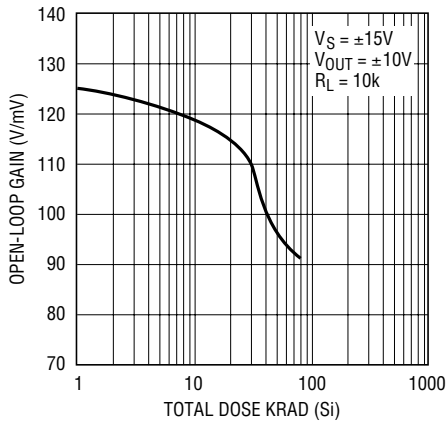
RH108A G02

### Input Offset Current



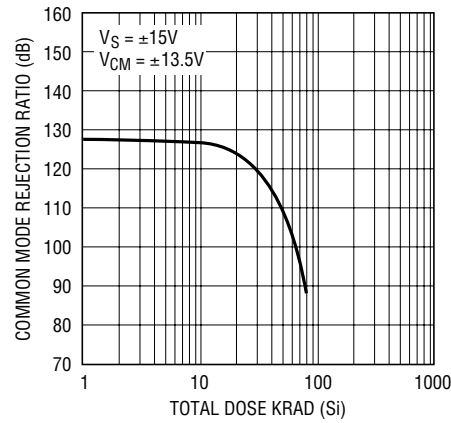
RH108A G03

### Open-Loop Gain



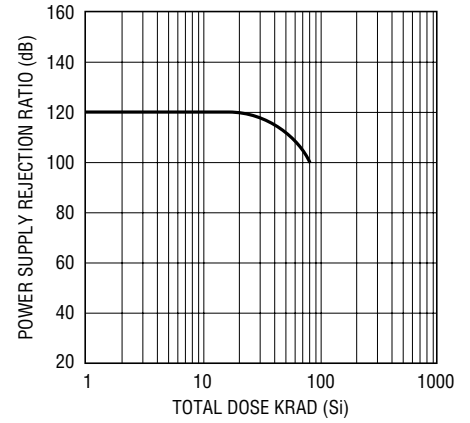
RH108A G04

### Common Mode Rejection Ratio



RH108A G05

### Power Supply Rejection Ratio



RH108A G06