LH2108/LH2308
Dual Super-Beta Operational Amplifier

GENERAL DESCRIPTION

The LH2108A/LH2308A and LH2108/LH2308 series of dual operational amplifiers consist of two LM108A or LM108 type op amps in a single hermetic package. Featuring all the same performance characteristics of the single device, these duals also offer closer thermal tracking, lower weight, and reduced insertion cost.

FEATURES

- **Low Offset Current — 50pA**
- **Low Offset Voltage — 0.7mV**
- **Low Offset Voltage**
  LH2108A: 0.3mV
  LH2108: 0.7mV
- **Wide Input Voltage Range — ±15V**
- **Wide Operating Supply Range — ±3V to ±20V**

ORDERING INFORMATION

PART NUMBER	TEMPERATURE RANGE	PACKAGE
LH2108D	-55°C to +125°C	16-PIN CERAMIC
LH2108AD	-55°C to +125°C	
LH2308D	0°C to +70°C	
LH2308AD	0°C to +70°C	

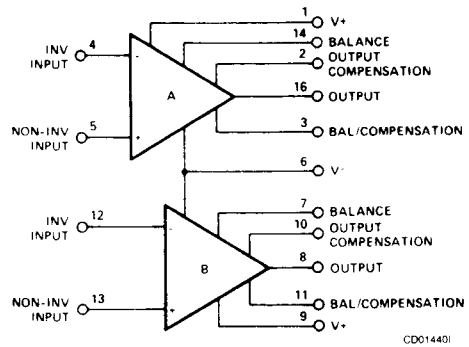

Figure 1: Functional Diagram

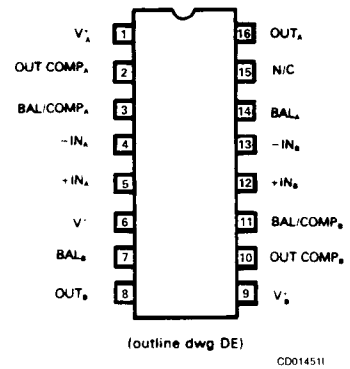

Figure 2: Pin Configuration

Note: All typical values have been guaranteed by characterization and are not tested.

LH2108/LH2308

ABSOLUTE MAXIMUM RATINGS

Supply Voltage ..... ±20V
Power Dissipation (Note 1) 500mW
Differential Input Current (Note 2) ..... ±10mA
Input Voltage (Note 3) ..... ±15V
Output Short Circuit Duration ..... Continuous

Operating Temperature Range
LH2108A/LH2108 ..... −55°C to +125°C
LH2308A/LH2408 ..... 0°C to +70°C
Storage Temperature Range ..... −65°C to +150°C
Lead Temperature (Soldering, 10sec) ..... 300°C

ELECTRICAL CHARACTERISTICS (See Note 4) (LH2108/LH2308)

PARAMETER	TEST CONDITIONS	LIMITS		UNIT
		LH2108	LH2308	
Input Offset Voltage	$T_A = 25°C$	2.0	7.5	mV Max
Input Offset Current	$T_A = 25°C$	0.2	1.0	nA Max
Input Bias Current	$T_A = 25°C$	2.0	7.0	
Input Resistance (Note 5)	$T_A = 25°C$	30	10	MΩ Min
Supply Current	$T_A = 25°C$	0.6	0.8	mA Max
Large Signal Voltage Gain	$T_A = 25°C$ $V_S = ±15V$ $V_{OUT} = ±10V$, $R_L \geq 10k\Omega$	50	25	V/mV Min
Input Offset Voltage		3.0	10	mV Max
Average Temperature Coefficient of Input Offset Voltage (Note 6)		15	30	µV/°C Max
Input Offset Current		0.4	1.5	nA Max
Average Temperature Coefficient of Input Offset Current (Note 6)		2.5	10	pA/°C Max
Input Bias Current		3.0	10	nA Max
Supply Current	$T_A = +125°C$	0.4	–	mA Max
Large Signal Voltage Gain	$V_S = ±15V$, $V_{OUT} = ±10V$ $R_L \geq 10k\Omega$	25	15	V/mV Min
Output Voltage Swing	$V_S = ±15V$, $R_L = 10k\Omega$	±13	±13	V Min
Input Voltage Range	$V_S = ±15V$	±13.5	±14	
Common Mode Rejection Ratio	$V_S = ±15V$, $V_{CM} = ±13.5V$	85	80	dB Min
Supply Voltage Rejection Ratio	±5V to ±20V	80	80	
ELECTRICAL CHARACTERISTICS — LH2108/LH2308				
Input Offset Voltage	$T_A = 25°C$	0.5	0.5	mV Max
Input Offset Current	$T_A = 25°C$	0.2	1.0	nA Max
Input Bias Current	$T_A = 25°C$	2.0	7.0	
Input Resistance	$T_A = 25°C$	30	10	MΩ Min
Supply Current	$T_A = 25°C$	0.6	0.8	mA Max
Large Signal Voltage Gain	$T_A = 25°C$ $V_S = ±15V$ $V_{OUT} = ±10V$, $R_L \geq 10k\Omega$	80	80	V/mV Min
Input Offset Voltage		1.0	0.73	mV Max
Average Temperature Coefficient of Input Offset Voltage (Note 6)		5	5	µV/°C Max
Input Offset Current		0.4	1.5	nA Max
Average Temperature Coefficient of Input Offset Current (Note 6)		2.5	10	pA/°C Max
Input Bias Current		3.0	10	nA Max
Supply Current	$T_A = +125°C$	0.4	–	mA Max
Large Signal Voltage Gain	$V_S = ±15V$, $V_{OUT} = ±10V$ $R_L \geq 10k\Omega$	40	60	V/mV Min
Output Voltage Swing	$V_S = ±15V$, $R_L = 10k\Omega$	±13	±13	V Min
Input Voltage Range	$V_S = ±15V$	±13.5	±14	

Note: All typical values have been guaranteed by characterization and are not tested.

ELECTRICAL CHARACTERISTICS (CONT.)

PARAMETER	TEST CONDITIONS	LIMITS		UNIT
		LH2108	LH2308	
Common Mode Rejection Ratio		96	96	dB Min
Supply Voltage Rejection Ratio		96	96	

NOTES:
1. The maximum junction temperature of the LH2108/A is 150°C, and that of the LH2308/A is 85°C. The thermal resistance of the packages is 100°C C/W, junction to ambient.
2. The inputs are shunted with back-to-back diodes for overvoltage protection. Therefore, excessive current will flow if a differential input voltage in excess of 1V is applied between the inputs unless some limiting resistance is used.
3. For supply voltages less than ±15V, the absolute maximum input voltage is equal to the supply voltage.
4. These specifications apply for $\pm 5V \leq V_S \leq \pm 20V$ and $-55°C \leq T_A \leq 125°C$, unless otherwise specified, and the LH2308A/LH2308 for $\pm 5V \leq V_S \leq 15V$ and $0°C \leq T_A \leq 70°C$.
5. Input resistance is guaranteed by Input Bias Current test.
6. For Design only, not 100% tested.

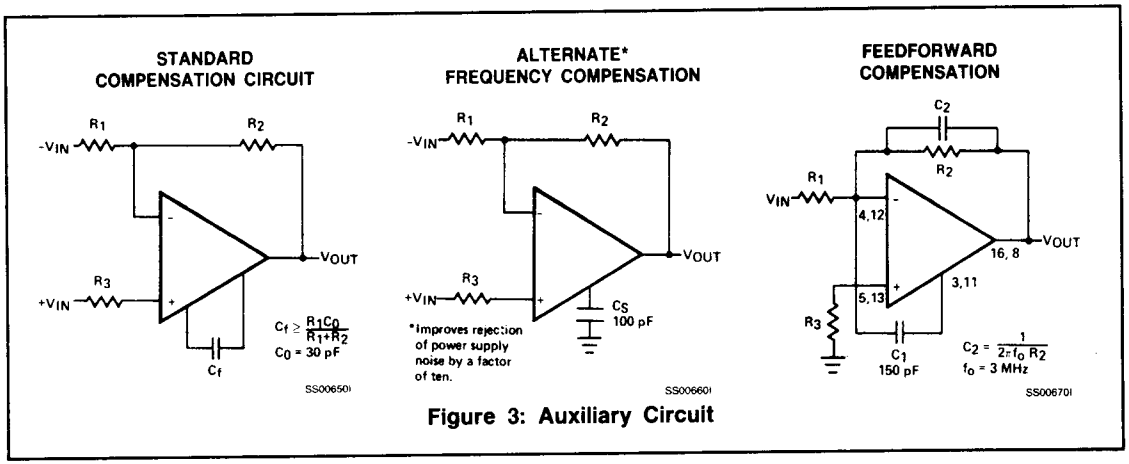

Figure 3: Auxiliary Circuit

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Note: All typical values have been guaranteed by characterization and are not tested.