

## FEATURES

- Low Cost
- Current Feedback Amplifier
- Differential Gain: 0.01%,  $R_L = 150\Omega$ ,  $V_S = \pm 5V$
- Differential Phase: 0.09°,  $R_L = 150\Omega$ ,  $V_S = \pm 5V$
- Flat to 30MHz, 0.1dB
- 100MHz Bandwidth on  $\pm 5V$
- Wide Supply Range:  $\pm 2V(4V)$  to  $\pm 14V(28V)$
- Low Power: 85mW at  $\pm 5V$

## APPLICATIONS

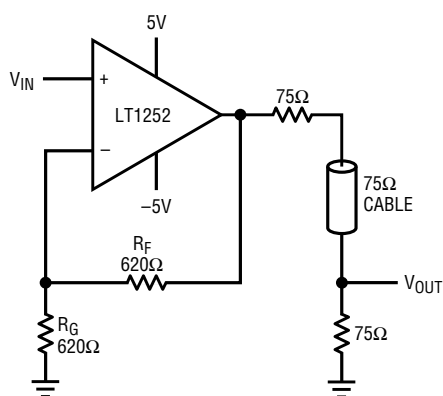
- RGB Cable Drivers
- Composite Video Cable Drivers
- Gain Blocks in IF Stages

## DESCRIPTION

The LT1252 is a low cost current feedback amplifier for video applications. The LT1252 is ideal for driving low impedance loads such as cables and filters. The wide bandwidth and high slew rate of this amplifier make driving RGB signals between PCs and workstations easy. The linearity of the LT1252 is outstanding; it is unsurpassed for driving composite video.

The LT1252 is available in the 8-pin DIP and the S8 surface mount package. For higher performance and shutdown operation, see the LT1227. For dual and quad amplifiers with similar performance see the LT1253/LT1254.

## TYPICAL APPLICATION

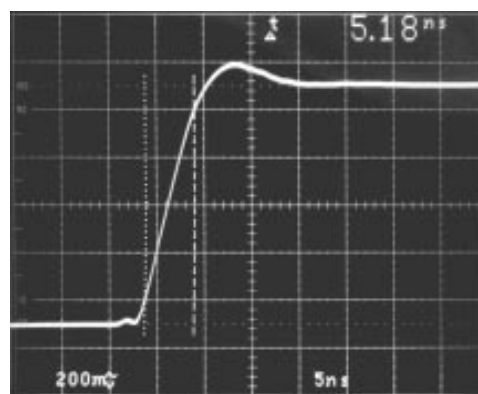


$$A_V = 1 + \frac{R_F}{R_G} \quad BW = 100MHz$$

AT AMPLIFIER OUTPUT.  
6dB LESS AT  $V_{OUT}$ .

LT1252 • TA01

Transient Response


 $V_S = \pm 5V$   
 $A_V = 2$   
 $R_L = 150\Omega$   
 $V_O = 1V$ 

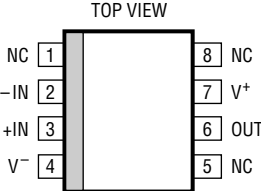
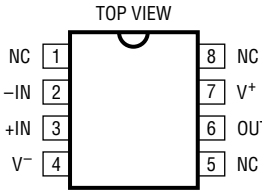
LT1252 • TA02

## ABSOLUTE MAXIMUM RATINGS

Total Supply Voltage ( $V^+$  to  $V^-$ ) ..... 28V  
 Input Current .....  $\pm 15\text{mA}$   
 Output Short-Circuit Duration (Note 1) ..... Continuous  
 Operating Temperature Range .....  $0^\circ\text{C}$  to  $70^\circ\text{C}$

Storage Temperature Range .....  $-65^\circ\text{C}$  to  $150^\circ\text{C}$   
 Junction Temperature (Note 2) .....  $150^\circ\text{C}$   
 Lead Temperature (Soldering, 10 sec) .....  $300^\circ\text{C}$

## PACKAGE/ORDER INFORMATION

 <p>S8 PACKAGE 8-LEAD PLASTIC SO</p> <p><math>T_{J\text{MAX}} = 150^\circ\text{C}</math>, <math>\theta_{JA} = 150^\circ\text{C/W}</math></p>	ORDER PART NUMBER	 <p>N8 PACKAGE 8-LEAD PLASTIC DIP</p> <p><math>T_{J\text{MAX}} = 150^\circ\text{C}</math>, <math>\theta_{JA} = 100^\circ\text{C/W}</math></p>	ORDER PART NUMBER
	LT1252CS8		LT1252CN8
	S8 PART MARKING		
	1252		

## ELECTRICAL CHARACTERISTICS $0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$ , $V_S = \pm 5\text{V}$ to $\pm 12\text{V}$ , unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
$V_{OS}$	Input Offset Voltage			5	15	mV
$+I_B$	Noninverting Bias Current			1	15	$\mu\text{A}$
$-I_B$	Inverting Bias Current			20	100	$\mu\text{A}$
$A_{VOL}$	Large-Signal Voltage Gain	$V_S = \pm 5\text{V}$ , $V_O = \pm 2\text{V}$ , $R_L = 150\Omega$	560	1500		V/V
PSRR	Power Supply Rejection Ratio	$V_S = \pm 3\text{V}$ to $\pm 12\text{V}$	60	70		dB
CMRR	Common-Mode Rejection Ratio	$V_S = \pm 5\text{V}$ , $V_{CM} = \pm 2\text{V}$	55	65		dB
$V_{OUT}$	Maximum Output Voltage Swing	$V_S = \pm 12\text{V}$ , $R_L = 500\Omega$ $V_S = \pm 5\text{V}$ , $R_L = 150\Omega$	$\pm 7.0$ $\pm 2.5$	$\pm 10.5$ $\pm 3.7$		V V
$I_{OUT}$	Maximum Output Current		30	55		mA
$I_S$	Supply Current			8.5	18	mA
$R_{IN}$	Input Resistance		1	10		$\text{M}\Omega$
$C_{IN}$	Input Capacitance			3		pF
	Power Supply Range	Dual	$\pm 2$		$\pm 12$	V
		Single	4		24	V
SR	Input Slew Rate	$A_V = 1$		125		V/ $\mu\text{s}$
	Output Slew Rate	$A_V = 2$		250		V/ $\mu\text{s}$

## ELECTRICAL CHARACTERISTICS $0^{\circ}\text{C} \leq T_A \leq 70^{\circ}\text{C}$ , $V_S = \pm 5\text{V}$ to $\pm 12\text{V}$ , unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
$t_r$	Small-Signal Rise Time	$V_S = \pm 12\text{V}$ , $A_V = 2$		3.5		ns
	Rise and Fall Time	$V_S = \pm 5\text{V}$ , $A_V = 2$ , $V_{OUT} = 1V_{P-P}$		5.2		ns
$t_p$	Propagation Delay	$V_S = \pm 5\text{V}$ , $A_V = 2$		3.5		ns

**Note 1:** A heat sink may be required to keep the junction temperature below absolute maximum when the output is shorted indefinitely.

$$\text{LT1252CN8: } T_J = T_A + (P_D \times 100^{\circ}\text{C/W})$$

$$\text{LT1252CS8: } T_J = T_A + (P_D \times 150^{\circ}\text{C/W})$$

**Note 2:**  $T_J$  is calculated from the ambient temperature  $T_A$  and power dissipation  $P_D$  according to the following formulas:

## TYPICAL AC PERFORMANCE

### BANDWIDTH

$V_S$	$A_V$	$R_L$	$R_F$	$R_G$	SMALL SIGNAL –3dB BW (MHz)	SMALL SIGNAL –0.1dB BW (MHz)	SMALL SIGNAL PEAKING (dB)
$\pm 12$	1	150	2370	None	282	45	1.9
$\pm 12$	–1	1000	1100	1100	58	17	0.1
$\pm 12$	–1	150	909	909	73	34	0.1
$\pm 12$	2	1000	1210	1210	253	20	0.1
$\pm 12$	2	150	909	909	142	38	0.1
$\pm 12$	5	1000	1000	249	73	25	0.1
$\pm 12$	5	150	866	215	75	31	0.1
$\pm 12$	10	1000	909	100	67	26	0.1
$\pm 12$	10	150	768	84.5	69	32	0.1
$\pm 5$	1	1000	2210	None	260	10	2.4
$\pm 5$	1	150	1300	None	232	50	0.8
$\pm 5$	–1	1000	1000	1000	50	11	0.1
$\pm 5$	–1	150	732	732	69	34	0.1
$\pm 5$	2	1000	909	909	133	24	0.1
$\pm 5$	2	150	787	787	100	30	0.1
$\pm 5$	5	1000	825	205	62	21	0.1
$\pm 5$	5	150	698	174	66	30	0.1
$\pm 5$	10	1000	750	82.5	58	22	0.1
$\pm 5$	10	150	619	68.1	60	30	0.1

### NTSC VIDEO (Note 1)

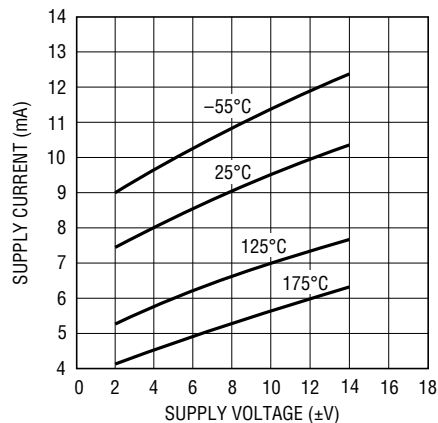
$V_S$	$A_V$	$R_L$	$R_F$	$R_G$	DIFFERENTIAL GAIN	DIFFERENTIAL PHASE
$\pm 12$	2	1000	1000	1000	0.02%	0.02°
$\pm 12$	2	150	1000	1000	0.03%	0.04°
$\pm 5$	2	1000	1000	1000	0.02%	0.08°
$\pm 5$	2	150	1000	1000	0.01%	0.09°

**Note 1:** Differential Gain and Phase are measured using a Tektronix TSG 120 YC/NTSC signal generator and a Tektronix 1780R Video Measurement Set. The resolution of this equipment is 0.1% and 0.1°. Ten identical

amplifier stages were cascaded giving an effective resolution of 0.01% and 0.01°.

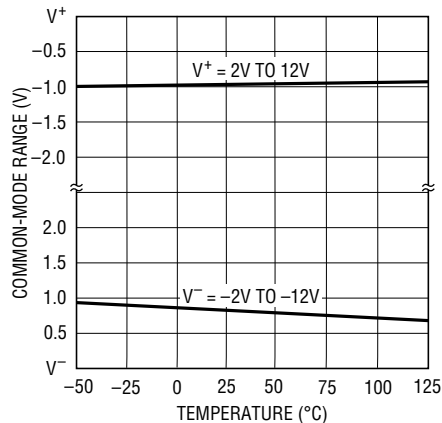
# TYPICAL PERFORMANCE CHARACTERISTICS

### Supply Current vs Supply Voltage



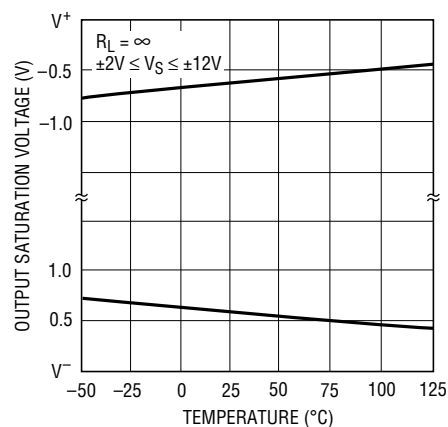
LT1252 • TPC01

### Input Common-Mode Limit vs Temperature



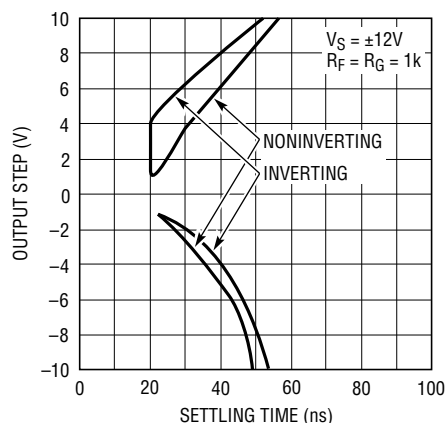
LT1252 • TPC02

### Output Saturation Voltage vs Temperature



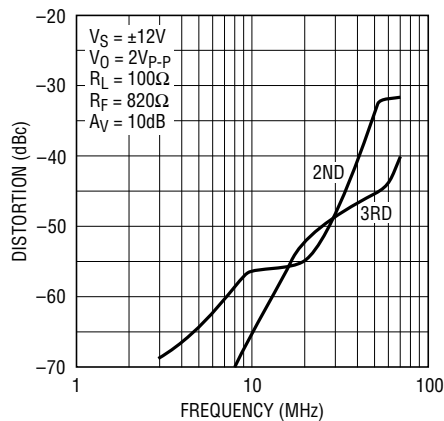
LT1252 • TPC03

### Settling Time to 10mV vs Output Step



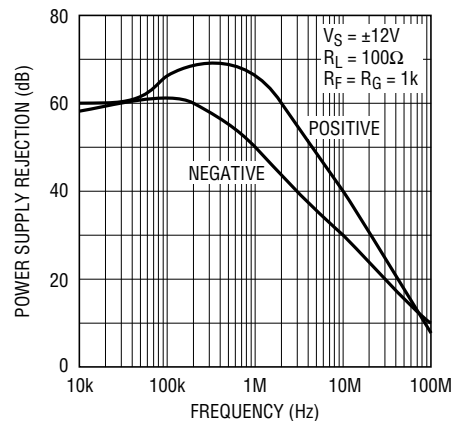
LT1252 • TPC04

### 2nd and 3rd Harmonic Distortion vs Frequency



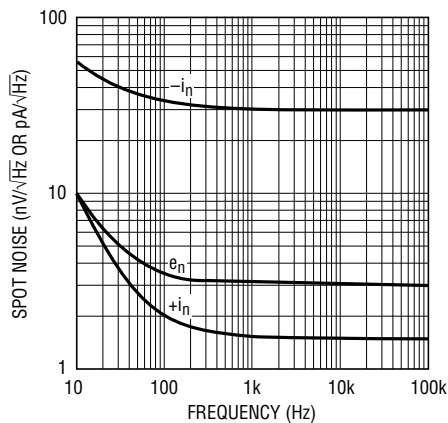
LT1252 • TPC05

### Power Supply Rejection vs Frequency



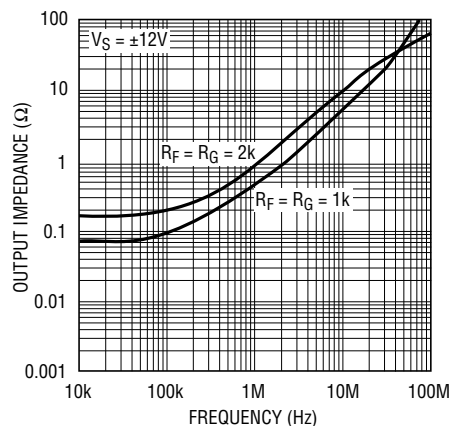
LT1252 • TPC06

### Spot Noise Voltage and Current vs Frequency



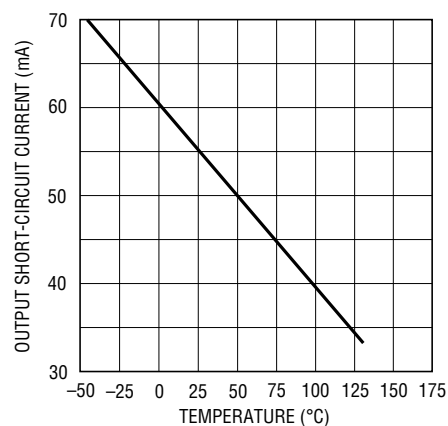
LT1252 • TPC07

### Output Impedance vs Frequency



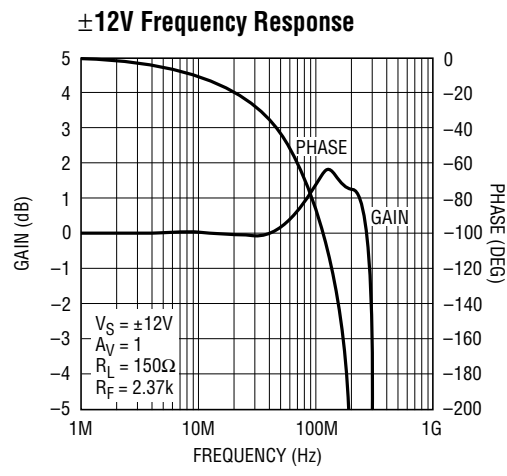
LT1252 • TPC08

### Output Short-Circuit Current vs Junction Temperature

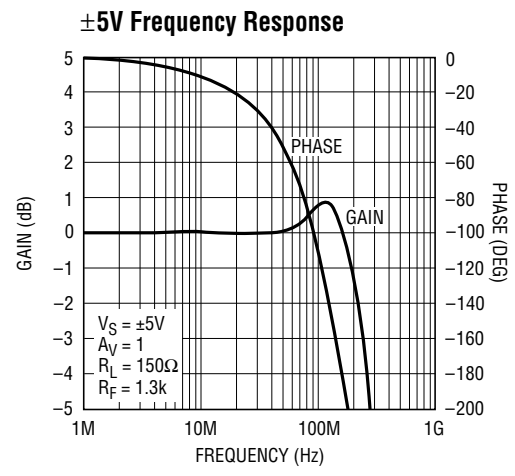


LT1252 • TPC09

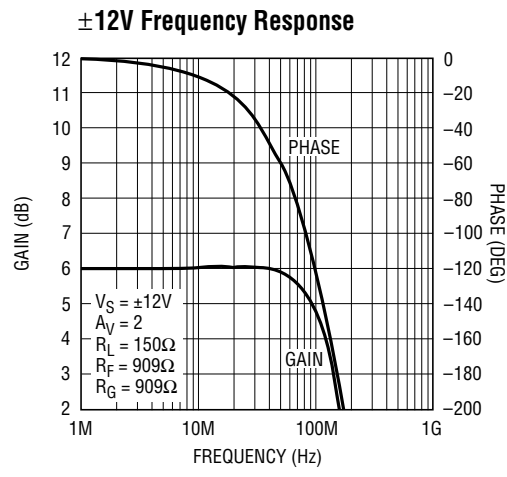
# TYPICAL PERFORMANCE CHARACTERISTICS



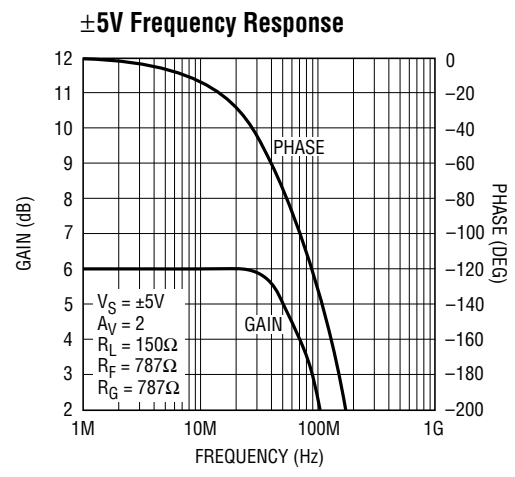
LT1252 • TPC10



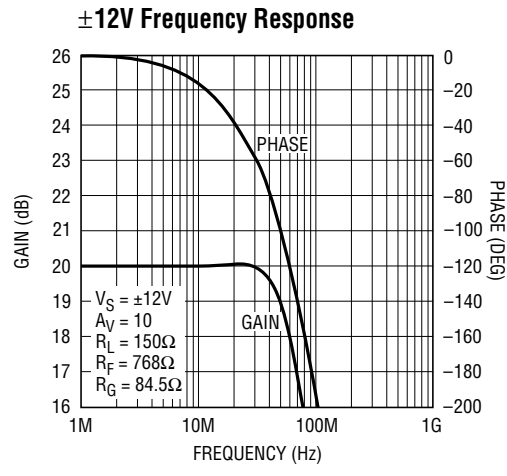
LT1252 • TPC11



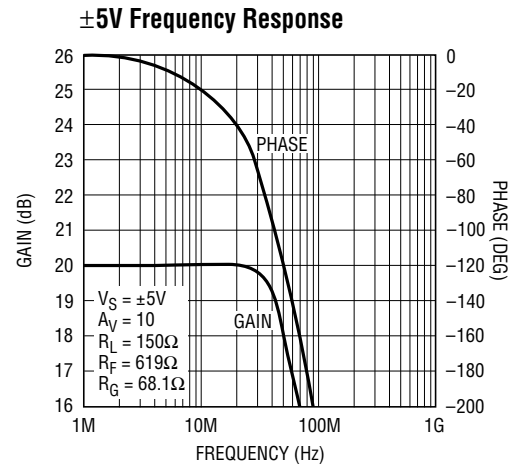
LT1252 • TPC12



LT1252 • TPC13



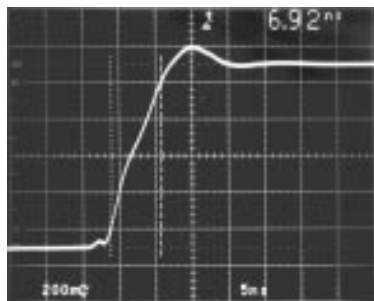
LT1252 • TPC14



LT1252 • TPC15

## TYPICAL PERFORMANCE CHARACTERISTICS

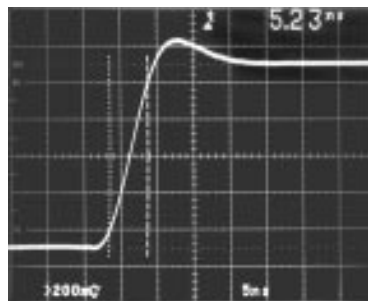
Transient Response



$V_S = \pm 5V$   
 $A_V = 1$   
 $R_L = 150\Omega$   
 $R_F = 619\Omega$   
 $V_O = 1V$

LT1252 • TPC16

Transient Response

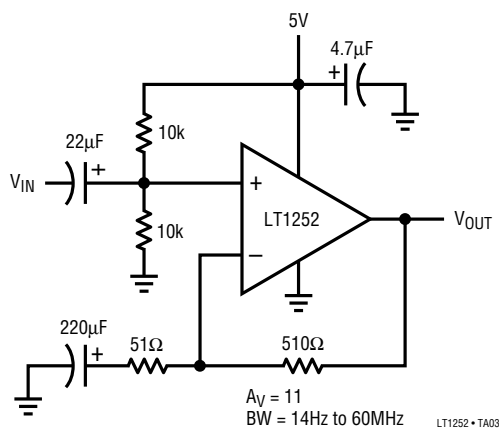


$V_S = \pm 5V$     $R_F = 619\Omega$   
 $A_V = 10$     $R_G = 68.1\Omega$   
 $R_L = 150\Omega$     $V_O = 1.5V$

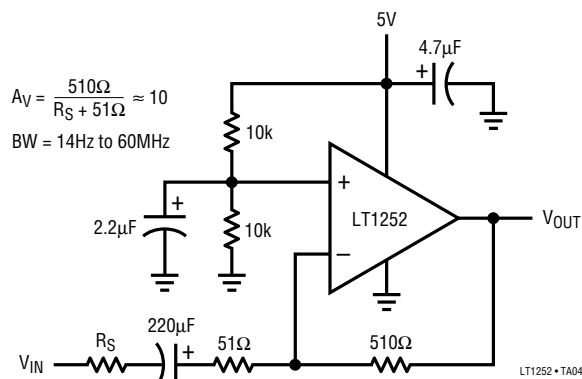
LT1252 • TPC17

## TYPICAL APPLICATIONS

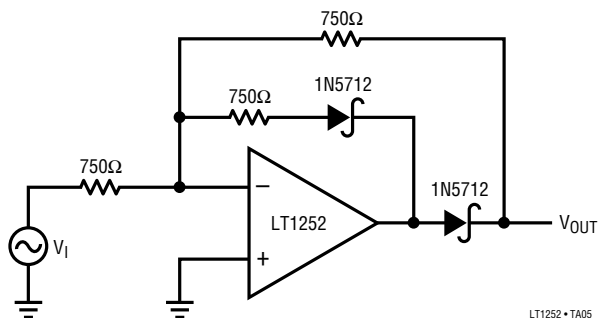
Single Supply AC-Coupled Amplifier  
Noninverting



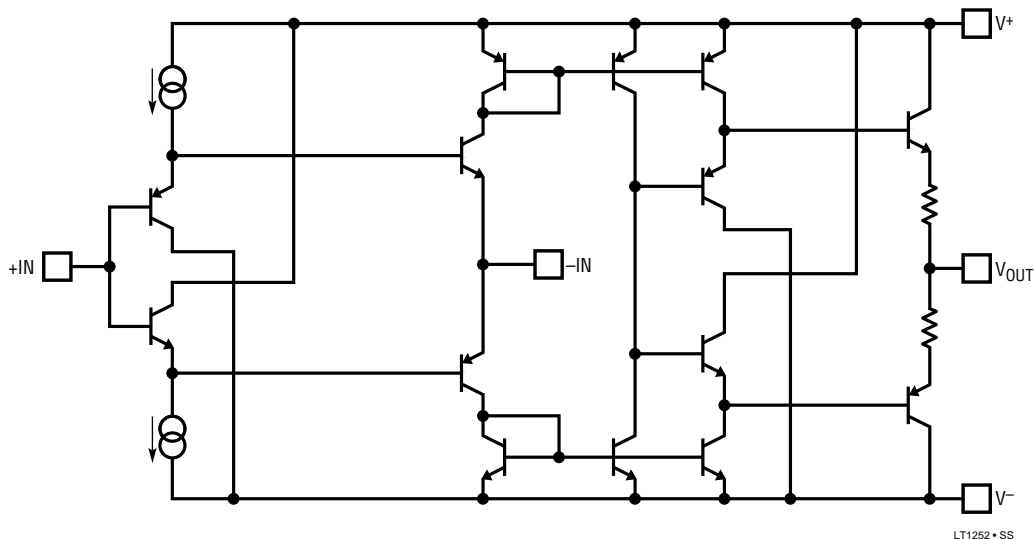
Single Supply AC-Coupled Amplifier  
Inverting



Half Wave Rectifier

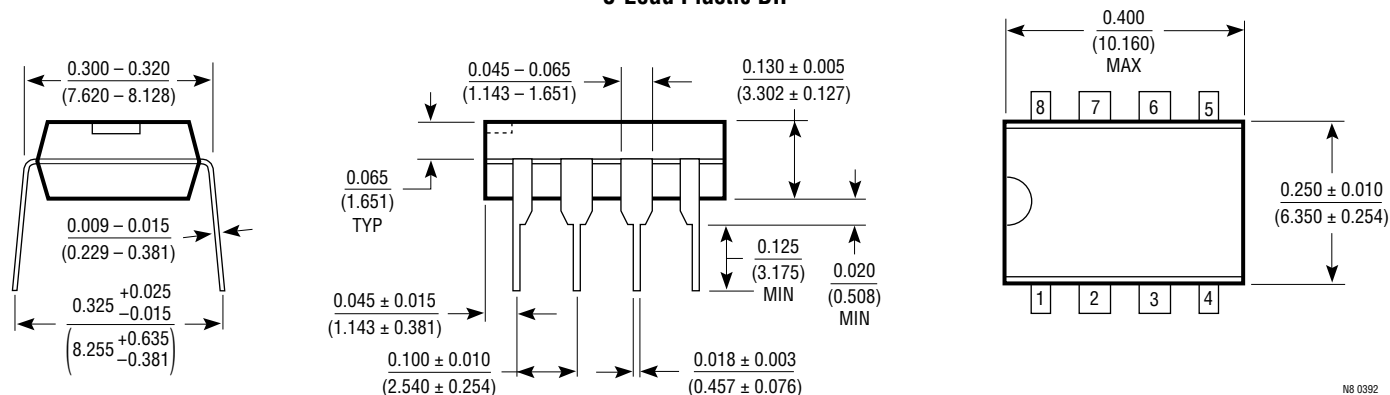


# SIMPLIFIED SCHEMATIC

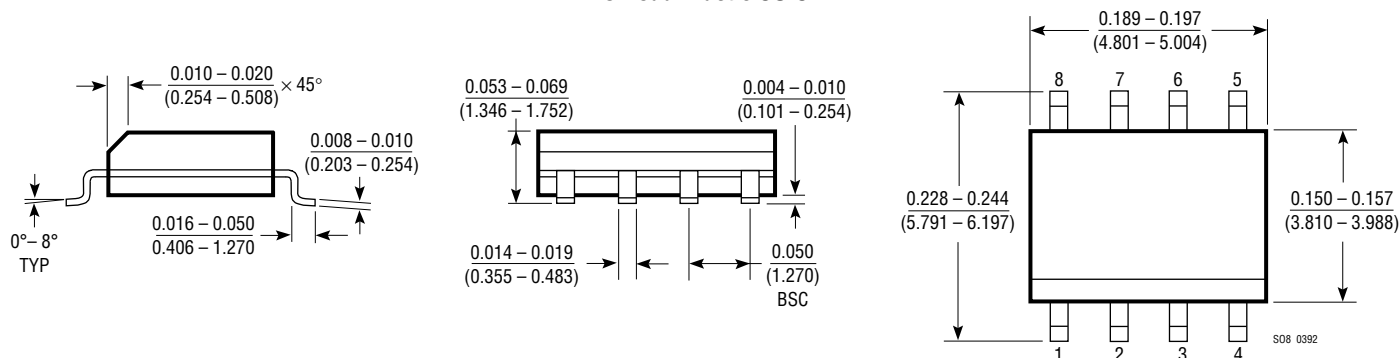


## PACKAGE DESCRIPTION Dimensions in inches (millimeters) unless otherwise noted.

### N8 Package 8-Lead Plastic DIP



### S8 Package 8-Lead Plastic SOIC



## U.S. Area Sales Offices

### NORTHEAST REGION

#### Linear Technology Corporation

One Oxford Valley  
2300 E. Lincoln Hwy., Suite 306  
Langhorne, PA 19047  
Phone: (215) 757-8578  
FAX: (215) 757-5631

#### Linear Technology Corporation

266 Lowell St., Suite B-8  
Wilmington, MA 01887  
Phone: (508) 658-3881  
FAX: (508) 658-2701

### SOUTHEAST REGION

#### Linear Technology Corporation

17060 Dallas Parkway  
Suite 208  
Dallas, TX 75248  
Phone: (214) 733-3071  
FAX: (214) 380-5138

### CENTRAL REGION

#### Linear Technology Corporation

Chesapeake Square  
229 Mitchell Court, Suite A-25  
Addison, IL 60101  
Phone: (708) 620-6910  
FAX: (708) 620-6977

### SOUTHWEST REGION

#### Linear Technology Corporation

22141 Ventura Blvd.  
Suite 206  
Woodland Hills, CA 91364  
Phone: (818) 703-0835  
FAX: (818) 703-0517

### NORTHWEST REGION

#### Linear Technology Corporation

782 Sycamore Dr.  
Milpitas, CA 95035  
Phone: (408) 428-2050  
FAX: (408) 432-6331

## International Sales Offices

### FRANCE

#### Linear Technology S.A.R.L.

Immeuble "Le Quartz"  
58 Chemin de la Justice  
92290 Chatenay Malabry  
France  
Phone: 33-1-41079555  
FAX: 33-1-46314613

### GERMANY

#### Linear Technolgy GmbH

Untere Hauptstr. 9  
D-85386 Eching  
Germany  
Phone: 49-89-3197410  
FAX: 49-89-3194821

### JAPAN

#### Linear Technology KK

5F YZ Bldg.  
4-4-12 Iidabashi, Chiyoda-Ku  
Tokyo, 102 Japan  
Phone: 81-3-3237-7891  
FAX: 81-3-3237-8010

### KOREA

#### Linear Technology Korea Branch

Namsong Building, #505  
Itaewon-Dong 260-199  
Yongsan-Ku, Seoul  
Korea  
Phone: 82-2-792-1617  
FAX: 82-2-792-1619

### SINGAPORE

#### Linear Technology Pte. Ltd.

101 Boon Keng Road  
#02-15 Kallang Ind. Estates  
Singapore 1233  
Phone: 65-293-5322  
FAX: 65-292-0398

### TAIWAN

#### Linear Technology Corporation

Rm. 801, No. 46, Sec. 2  
Chung Shan N. Rd.  
Taipei, Taiwan, R.O.C.  
Phone: 886-2-521-7575  
FAX: 886-2-562-2285

### UNITED KINGDOM

#### Linear Technology (UK) Ltd.

The Coliseum, Riverside Way  
Camberley, Surrey GU15 3YL  
United Kingdom  
Phone: 44-276-677676  
FAX: 44-276-64851

## World Headquarters

#### Linear Technology Corporation

1630 McCarthy Blvd.  
Milpitas, CA 95035-7487  
Phone: (408) 432-1900  
FAX: (408) 434-0507

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