Low Cost Video Amplifier

FEATURES

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

APPLICATIONS

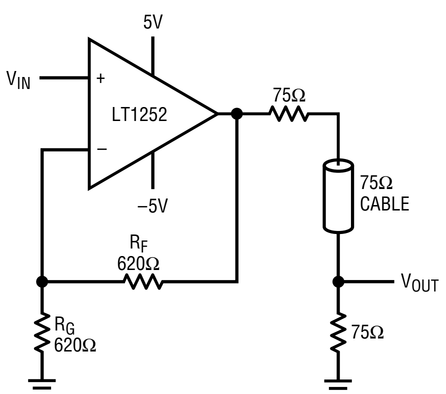
- RGB Cable Drivers
- Composite Video Cable Drivers
- Gain Blocks in IF Stages

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

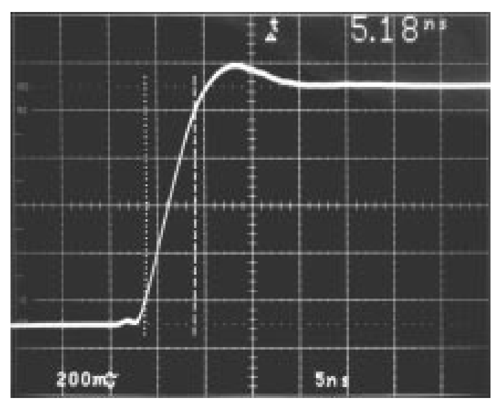


$A_V = 1 + \frac{R_F}{R_G}$ BW = 100MHz

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

LT1252 • TA01

Transient Response



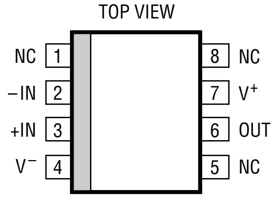
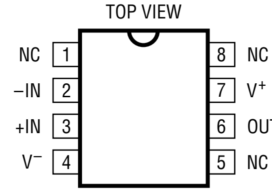
V_S = ±5V
A_V = 2
R_L = 150Ω
V_O = 1V

LT1252 • TA02

ABSOLUTE MAXIMUM RATINGS

Total Supply Voltage (V^+ to V^-) 28V
Input Current .... ±15mA
Output Short-Circuit Duration (Note 1) .... Continuous
Operating Temperature Range .... 0°C to 70°C
Storage Temperature Range .... –65°C to 150°C
Junction Temperature (Note 2) .... 150°C
Lead Temperature (Soldering, 10 sec) .... 300°C

PACKAGE/ORDER INFORMATION

	ORDER PART NUMBER		ORDER PART NUMBER
TOP VIEW  S8 PACKAGE 8-LEAD PLASTIC SO T_{JMAX} = 150°C, θ_{JA} = 150°C/W	LT1252CS8	TOP VIEW  N8 PACKAGE 8-LEAD PLASTIC DIP T_{JMAX} = 150°C, θ_{JA} = 100°C/W	LT1252CN8
	S8 PART MARKING		
	1252		

ELECTRICAL CHARACTERISTICS 0°C ≤ T_A ≤ 70°C, V_S = ±5V to ±12V, 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	µA
$-I_B$	Inverting Bias Current			20	100	µA
A_{VOL}	Large-Signal Voltage Gain	V_S = ±5V, V_O = ±2V, R_L = 150Ω	560	1500		V/V
PSRR	Power Supply Rejection Ratio	V_S = ±3V to ±12V	60	70		dB
CMRR	Common-Mode Rejection Ratio	V_S = ±5V, V_{CM} = ±2V	55	65		dB
V_{OUT}	Maximum Output Voltage Swing	V_S = ±12V, R_L = 500Ω V_S = ±5V, R_L = 150Ω	±7.0 ±2.5	±10.5 ±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		MΩ
C_{IN}	Input Capacitance			3		pF
	Power Supply Range Dual Single		±2 4		±12 24	V V
SR	Input Slew Rate	A_V = 1		125		V/µs
	Output Slew Rate	A_V = 2		250		V/µs

ELECTRICAL CHARACTERISTICS $0°C \le T_A \le 70°C$, $V_S = \pm5V$ to $\pm12V$, unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
t_r	Small-Signal Rise Time	$V_S = \pm12V$, $A_V = 2$		3.5		ns
	Rise and Fall Time	$V_S = \pm5V$, $A_V = 2$, $V_{OUT} = 1V_{P-P}$		5.2		ns
t_p	Propagation Delay	$V_S = \pm5V$, $A_V = 2$		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.

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

LT1252CN8: $T_J = T_A + (P_D \times 100°C/W)$
LT1252CS8: $T_J = T_A + (P_D \times 150°C/W)$

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)
±12	1	150	2370	None	282	45	1.9
±12	−1	1000	1100	1100	58	17	0.1
±12	−1	150	909	909	73	34	0.1
±12	2	1000	1210	1210	253	20	0.1
±12	2	150	909	909	142	38	0.1
±12	5	1000	1000	249	73	25	0.1
±12	5	150	866	215	75	31	0.1
±12	10	1000	909	100	67	26	0.1
±12	10	150	768	84.5	69	32	0.1
±5	1	1000	2210	None	260	10	2.4
±5	1	150	1300	None	232	50	0.8
±5	−1	1000	1000	1000	50	11	0.1
±5	−1	150	732	732	69	34	0.1
±5	2	1000	909	909	133	24	0.1
±5	2	150	787	787	100	30	0.1
±5	5	1000	825	205	62	21	0.1
±5	5	150	698	174	66	30	0.1
±5	10	1000	750	82.5	58	22	0.1
±5	10	150	619	68.1	60	30	0.1

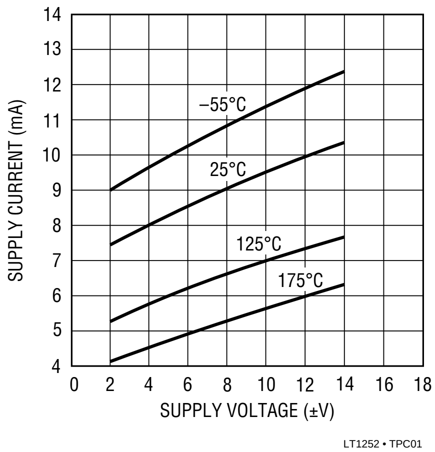
NTSC VIDEO (Note 1)

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

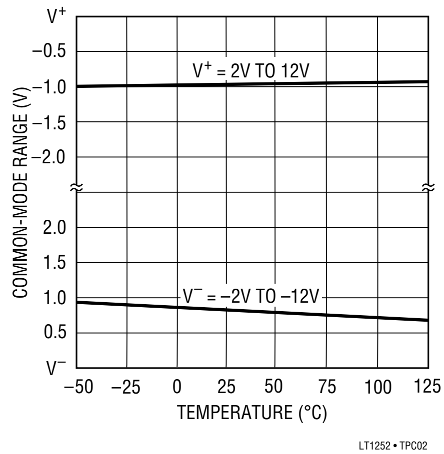
Note 1: Differential Gain and Phase are measured using a Tektronix TSG 120 YC/NTSC signal generator and a Tektronix 1780R Video Measurement Set. The resolution of this equipment is 0.1% and 0.1°. Ten identical amplifier stages were cascaded giving an effective resolution of 0.01% and 0.01°.

TYPICAL PERFORMANCE CHARACTERISTICS

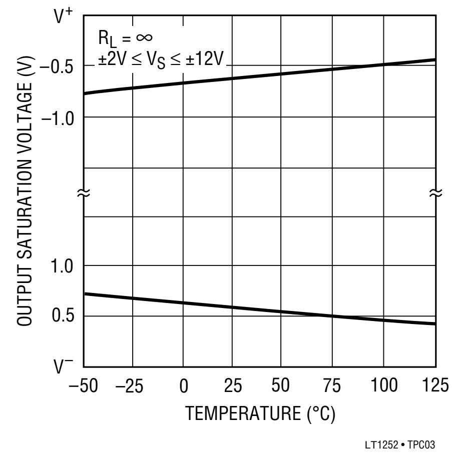
Supply Current vs Supply Voltage



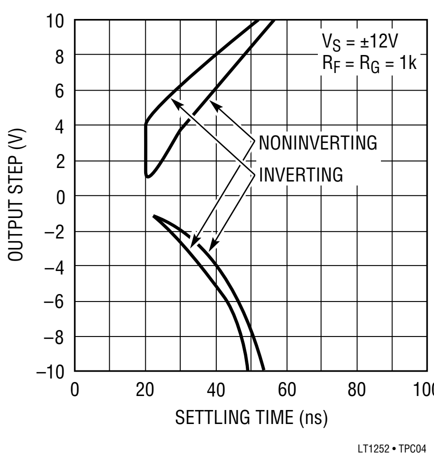
Input Common-Mode Limit vs Temperature



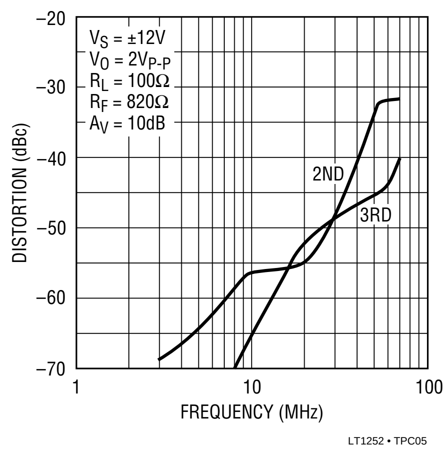
Output Saturation Voltage vs Temperature



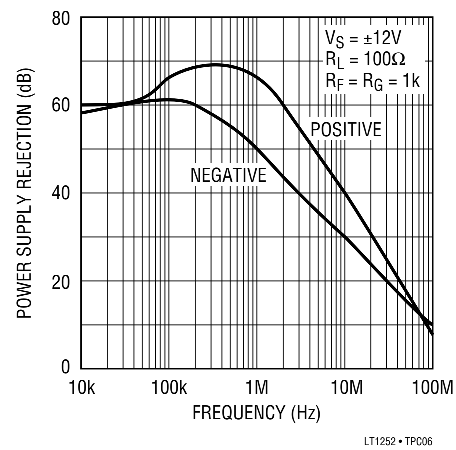
Settling Time to 10mV vs Output Step



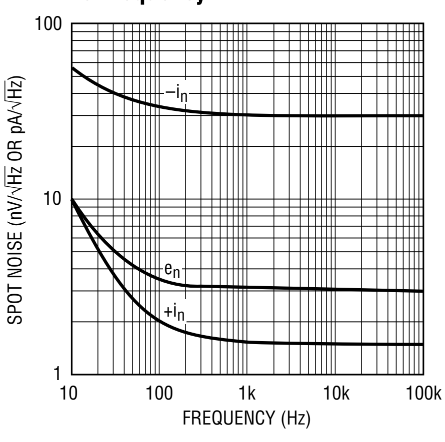
2nd and 3rd Harmonic Distortion vs Frequency



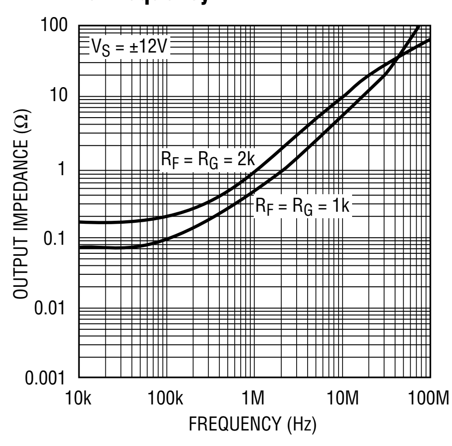
Power Supply Rejection vs Frequency



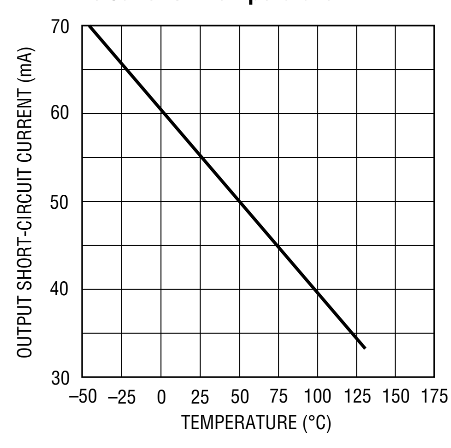
Spot Noise Voltage and Current vs Frequency



Output Impedance vs Frequency

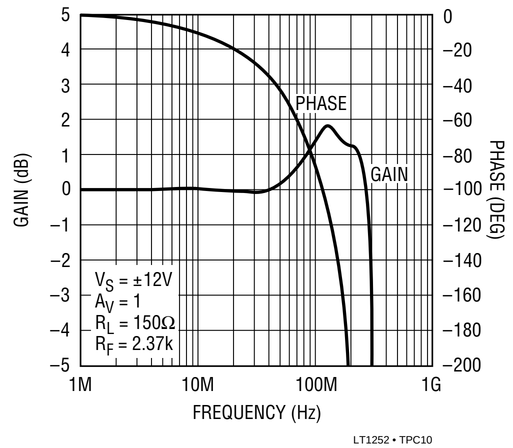


Output Short-Circuit Current vs Junction Temperature

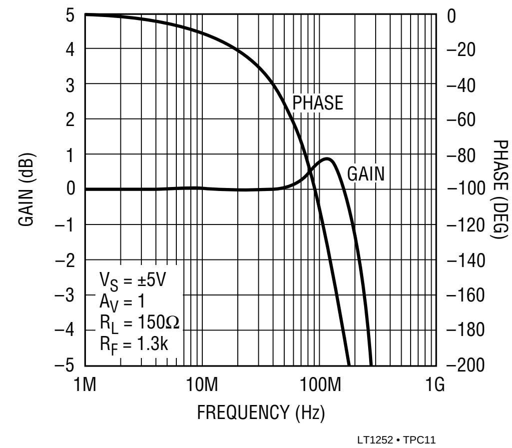


TYPICAL PERFORMANCE CHARACTERISTICS

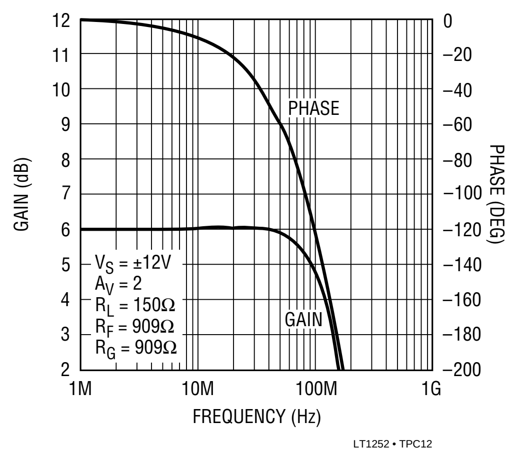
±12V Frequency Response



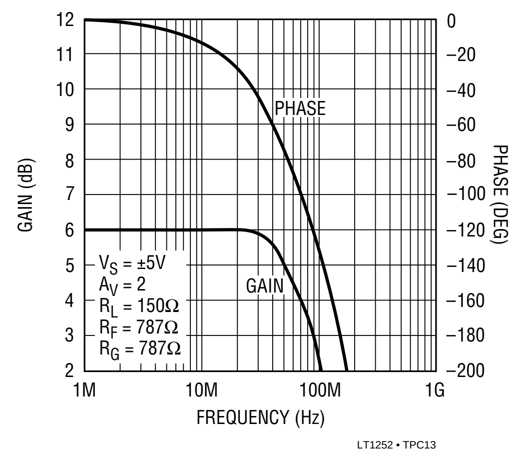
±5V Frequency Response



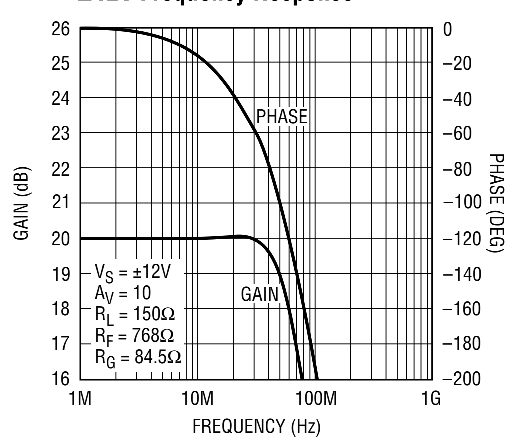
±12V Frequency Response



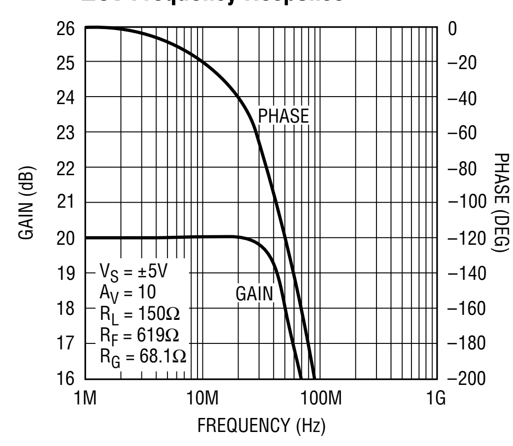
±5V Frequency Response



±12V Frequency Response

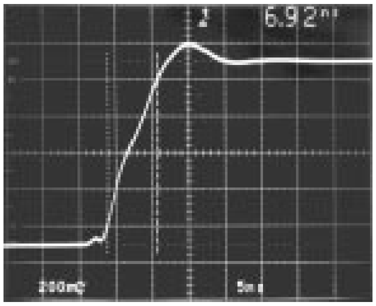


±5V Frequency Response



TYPICAL PERFORMANCE CHARACTERISTICS

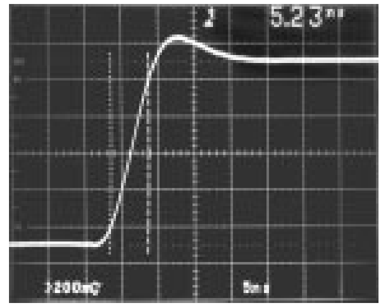
Transient Response



LT1252 • TPC16

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

Transient Response

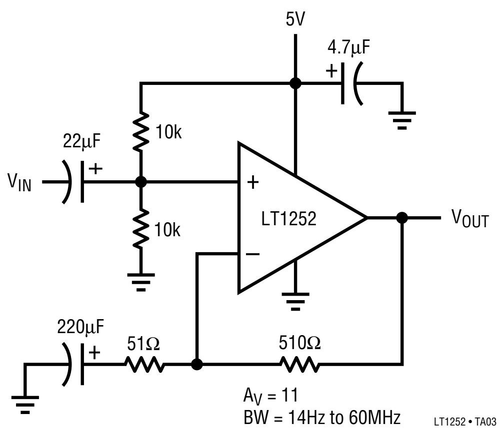


LT1252 • TPC17

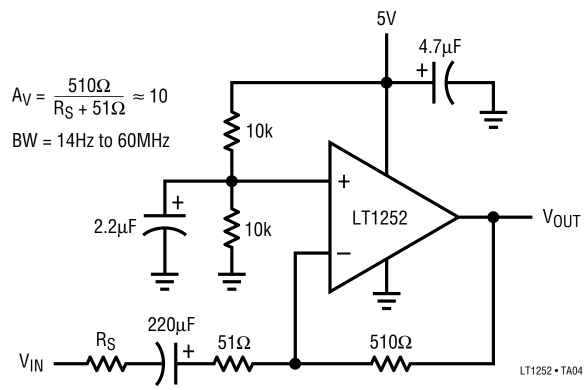
$V_S = \pm 5V$ $R_F = 619\Omega$
$A_V = 10$ $R_G = 68.1\Omega$
$R_L = 150\Omega$ $V_O = 1.5V$

TYPICAL APPLICATIONS

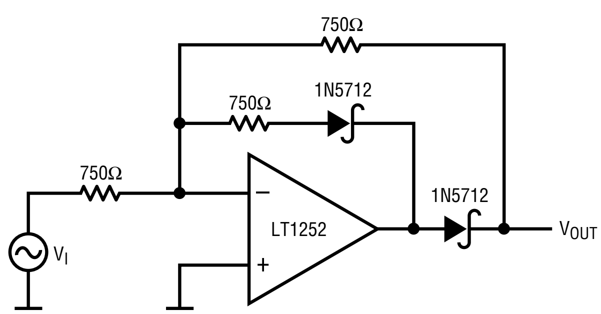
Single Supply AC-Coupled Amplifier Noninverting



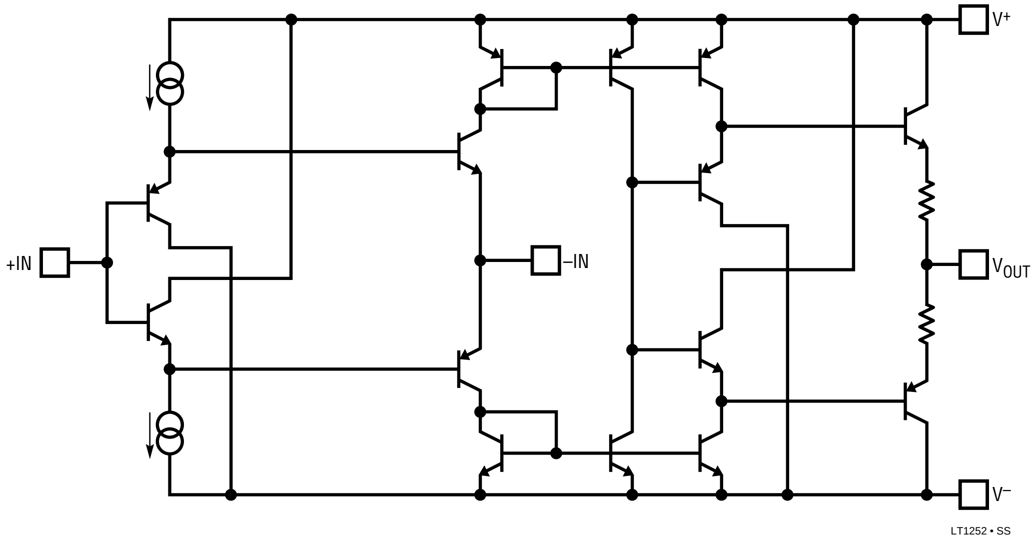
Single Supply AC-Coupled Amplifier Inverting



Half Wave Rectifier



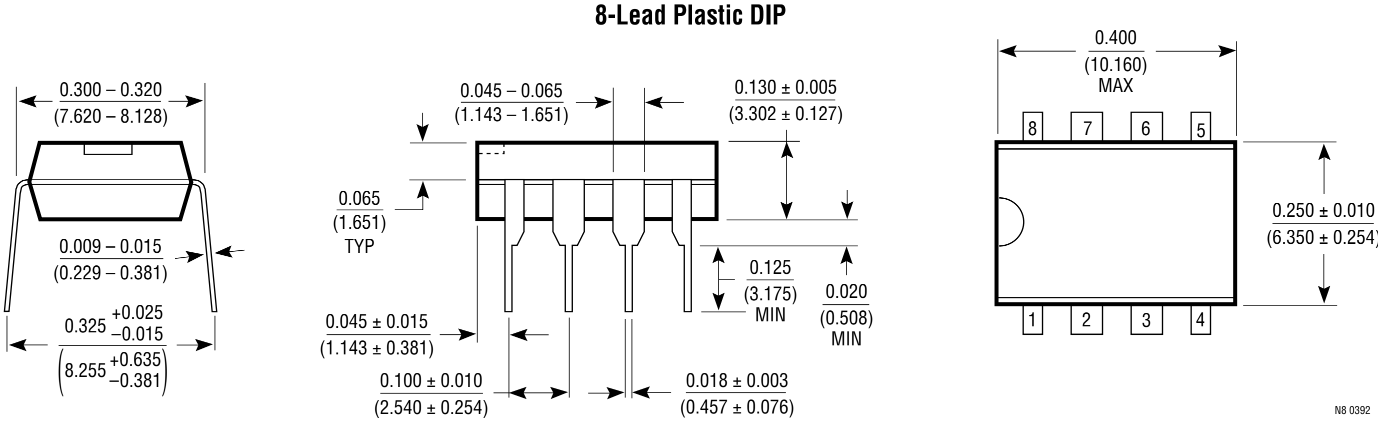
SIMPLIFIED SCHEMATIC



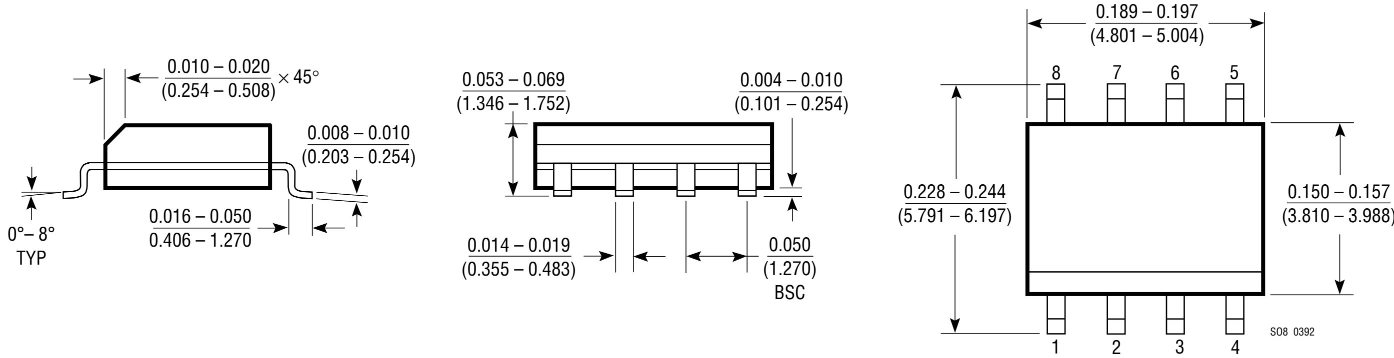
PACKAGE DESCRIPTION

Dimensions in inches (millimeters) unless otherwise noted.

N8 Package
8-Lead Plastic DIP



S8 Package
8-Lead Plastic SOIC



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