# Dual/Quad Decompensated Low Noise, High Speed Precision Op Amps

## FEATURES

- 100% Tested Low Voltage Noise — 2.7nV/√Hz Typ, 4.2nV/√Hz Max
- Slew Rate — 11V/µs Typ
- Gain-Bandwidth Product — 65MHz Typ
- Offset Voltage, Prime Grade — 70µV Max
  Low Grade — 100µV Max
- High Voltage Gain — 5 Million Min
- Supply Current Per Amplifier — 3.1mA Max
- Common Mode Rejection — 112dB Min
- Power Supply Rejection — 116dB Min
- Available in 8-Pin SO Package

## APPLICATIONS

- Two and Three Op Amp Instrumentation Amplifiers
- Low Noise Signal Processing
- Active Filters
- Microvolt Accuracy Threshold Detection
- Strain Gauge Amplifiers
- Direct Coupled Audio Gain Stages
- Tape Head Preamplifiers
- Microphone Preamplifiers
- Accelerometer Amplifiers
- Infrared Detectors

## DESCRIPTION

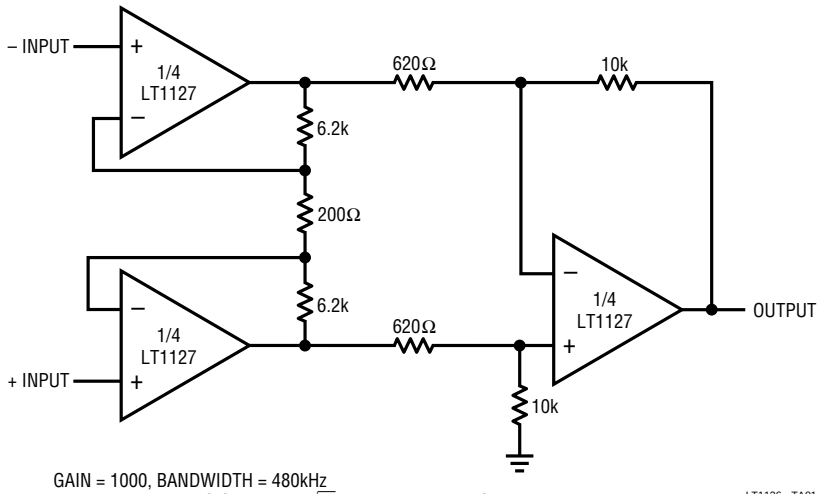
The LT1126 dual and LT1127 quad are high performance, decompensated op amps that offer higher slew rate and bandwidth than the LT1124 dual and the LT1125 quad operational amplifiers. The enhanced AC performance is available without degrading DC specs of the LT1124/LT1125. Both LT1126/LT1127 are stable in a gain of 10 or more.

In the design, processing, and testing of the device, particular attention has been paid to the optimization of the entire distribution of several key parameters. Slew rate, gain-bandwidth, and 1kHz noise are 100% tested for each individual amplifier. Consequently, the specifications of even the lowest cost grades (the LT1126C and the LT1127C) have been enhanced.

Power consumption of the dual LT1126 is less than one half of two OP-37s. Low power and high performance in an 8-pin SO package makes the LT1126 a first choice for surface mounted systems and where board space is restricted.

Protected by U.S. patents 4,775,884 and 4,837,496.

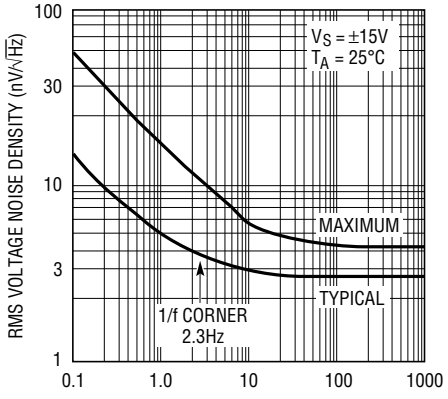
**Low Noise, Wide Bandwidth Instrumentation Amplifier**




GAIN = 1000, BANDWIDTH = 480kHz
INPUT REFERRED NOISE = 4.5nV/√Hz AT 1kHz, 6µV$_{RMS}$ OVER BANDWIDTH

LT1126 • TA01

**Voltage Noise vs Frequency**




LT1126 • TA07

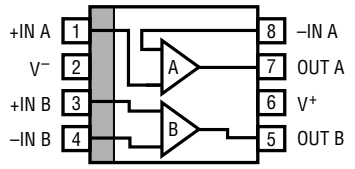
## ABSOLUTE MAXIMUM RATINGS

Supply Voltage ..... ±22V
Input Voltage ..... Equal to Supply Voltage
Output Short Circuit Duration ..... Indefinite
Differential Input Current (Note 5) ..... ±25mA
Lead Temperature (Soldering, 10 sec.) ..... 300°C

Operating Temperature Range
LT1126AM/LT1126M
LT1127AM/LT1127M ..... –55°C to 125°C
LT1126AC/LT1126C
LT1127AC/LT1127C ..... –40°C to 85°C
Storage Temperature Range
All Grades ..... –65°C to 150°C

## PACKAGE/ORDER INFORMATION

TOP VIEW



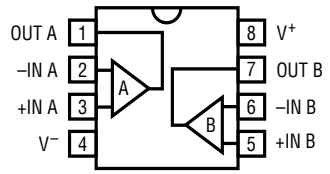

S8 PACKAGE
8-LEAD PLASTIC SOIC

NOTE: THIS PIN CONFIGURATION DIFFERS FROM THE 8-PIN DIP CONFIGURATION. INSTEAD, IT FOLLOWS THE INDUSTRY STANDARD LT1013DS8 SO PACKAGE PIN LOCATIONS

LT1126 • POI01

| ORDER PART NUMBER |
|---|
| LT1126CS8 |
| **S8 PART MARKING** |
| 1126 |

TOP VIEW



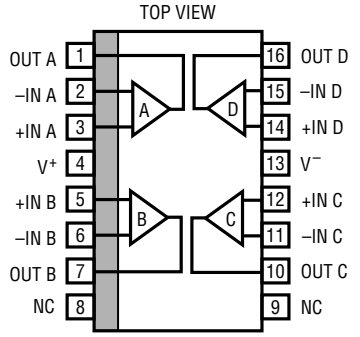

J8 PACKAGE
8-LEAD CERAMIC DIP

N8 PACKAGE
8-LEAD PLASTIC DIP

LT1126 • POI02

| ORDER PART NUMBER |
|---|
| LT1126AMJ8 |
| LT1126MJ8 |
| LT1126CJ8 |
| LT1126ACN8 |
| LT1126CN8 |

TOP VIEW

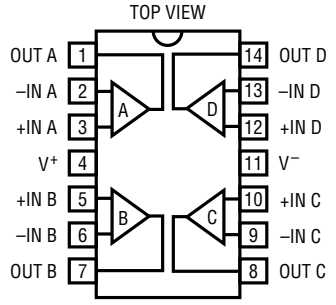



S PACKAGE
16-LEAD PLASTIC SOL

LT1126 • POI03

| ORDER PART NUMBER |
|---|
| LT1127CS |

TOP VIEW




J PACKAGE
14-LEAD CERAMIC DIP

N PACKAGE
14-LEAD PLASTIC DIP

LT1126 • POI04

| ORDER PART NUMBER |
|---|
| LT1127AMJ |
| LT1127MJ |
| LT1127CJ |
| LT1127ACN |
| LT1127CN |

## ELECTRICAL CHARACTERISTICS

**$V_S$ = ±15V, $T_A$ = 25°C, unless otherwise noted.**

| SYMBOL | PARAMETER | CONDITIONS (Note 1) | LT1126AM/AC LT1127AM/AC MIN | TYP | MAX | LT1126M/C LT1127M/C MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|---|---|---|
| $V_{OS}$ | Input Offset Voltage | LT1126 | | 20 | 70 | | 25 | 100 | µV |
| | | LT1127 | | 25 | 90 | | 30 | 140 | µV |
| $\frac{\Delta V_{OS}}{\Delta Time}$ | Long Term Input Offset Voltage Stability | | | 0.3 | | | 0.3 | | µV/Mo |
| $I_{OS}$ | Input Offset Current | LT1126 | | 5 | 15 | | 6 | 20 | nA |
| | | LT1127 | | 6 | 20 | | 7 | 30 | nA |
| $I_B$ | Input Bias Current | | | ±7 | ±20 | | ±8 | ±30 | nA |
| $e_n$ | Input Noise Voltage | 0.1Hz to 10Hz (Notes 7 and 8) | | 70 | 200 | | 70 | | nVp-p |

## ELECTRICAL CHARACTERISTICS $V_S = \pm 15V$, $T_A = 25°C$, unless otherwise noted.

| SYMBOL | PARAMETER | CONDITIONS (Note 1) | LT1126AM/AC LT1127AM/AC MIN | TYP | MAX | LT1126M/C LT1127M/C MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|---|---|---|
| | Input Noise Voltage Density | $f_O$ = 10Hz (Note 3) | | 3.0 | 5.5 | | 3.0 | 5.5 | nV/√Hz |
| | | $f_O$ = 1000Hz (Note 2) | | 2.7 | 4.2 | | 2.7 | 4.2 | nV/√Hz |
| $i_n$ | Input Noise Current Density | $f_O$ = 10Hz | | 1.3 | | | 1.3 | | pA/√Hz |
| | | $f_O$ = 1000Hz | | 0.3 | | | 0.3 | | pA/√Hz |
| $V_{CM}$ | Input Voltage Range | | ±12.0 | ±12.8 | | ±12.0 | ±12.8 | | V |
| CMRR | Common Mode Rejection Ratio | $V_{CM}$ = ±12V | 112 | 126 | | 106 | 124 | | dB |
| PSRR | Power Supply Rejection Ratio | $V_S$ = ±4V to ±18V | 116 | 126 | | 110 | 124 | | dB |
| $A_{VOL}$ | Large Signal Voltage Gain | $R_L \geq 10k\Omega$, $V_O$ = ±10V | 5.0 | 17.0 | | 3.0 | 15.0 | | V/μV |
| | | $R_L \geq 2k\Omega$, $V_O$ = ±10V | 2.0 | 4.0 | | 1.5 | 3.0 | | V/μV |
| $V_{OUT}$ | Maximum Output Voltage Swing | $R_L \geq 2k\Omega$ | ±13.0 | ±13.8 | | ±12.5 | ±13.8 | | V |
| SR | Slew Rate | $R_L \geq 2k\Omega$ (Notes 2 and 6) | 8.0 | 11 | | 8.0 | 11 | | V/μs |
| GBW | Gain-Bandwidth Product | $f_O$ = 10kHz (Note 2) | 45 | 65 | | 45 | 65 | | MHz |
| $Z_O$ | Open Loop Output Resistance | $V_O$ = 0, $I_O$ = 0 | | 75 | | | 75 | | Ω |
| $I_S$ | Supply Current Per Amplifier | | | 2.6 | 3.1 | | 2.6 | 3.1 | mA |
| | Channel Separation | f ≤ 10Hz (Note 8) | 134 | 150 | | 130 | 150 | | dB |
| | | $V_O$ = ±10V, $R_L$ = 2kΩ | | | | | | | |

## ELECTRICAL CHARACTERISTICS $V_S = \pm 15V$, $-55°C \leq T_A \leq 125°C$, unless otherwise noted.

| SYMBOL | PARAMETER | CONDITIONS (Note 1) | | LT1126AM LT1127AM MIN | TYP | MAX | LT1126M LT1127M MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|---|---|---|---|
| $V_{OS}$ | Input Offset Voltage | LT1126 | ● | | 50 | 170 | | 60 | 250 | μV |
| | | LT1127 | ● | | 55 | 190 | | 70 | 290 | μV |
| $\frac{\Delta V_{OS}}{\Delta Temp}$ | Average Input Offset Voltage Drift | (Note 4) | ● | | 0.3 | 1.0 | | 0.4 | 1.5 | μV/°C |
| $I_{OS}$ | Input Offset Current | LT1126 | ● | | 18 | 45 | | 20 | 60 | nA |
| | | LT1127 | ● | | 18 | 55 | | 20 | 70 | nA |
| $I_B$ | Input Bias Current | | ● | | ±18 | ±55 | | ±20 | ±70 | nA |
| $V_{CM}$ | Input Voltage Range | | ● | ±11.3 | ±12 | | ±11.3 | ±12 | | V |
| CMRR | Common Mode Rejection Ratio | $V_{CM}$ = ±11.3V | ● | 106 | 122 | | 100 | 120 | | dB |
| PSRR | Power Supply Rejection Ratio | $V_S$ = ±4V to ±18V | ● | 110 | 122 | | 104 | 120 | | dB |
| $A_{VOL}$ | Large Signal Voltage Gain | $R_L \geq 10k\Omega$, $V_O$ = ±10V | ● | 3.0 | 10.0 | | 2.0 | 10.0 | | V/μV |
| | | $R_L \geq 2k\Omega$, $V_O$ = ±10V | ● | 1.0 | 3.0 | | 0.7 | 2.0 | | V/μV |
| $V_{OUT}$ | Maximum Output Voltage Swing | $R_L \geq 2k\Omega$ | ● | ±12.5 | ±13.6 | | ±12.0 | ±13.6 | | V |
| SR | Slew Rate | $R_L \geq 2k\Omega$ (Notes 2 and 6) | ● | 7.2 | 10 | | 7.0 | 10 | | V/μs |
| $I_S$ | Supply Current Per Amplifier | | ● | | 2.8 | 3.5 | | 2.8 | 3.5 | mA |

The ● denotes the specifications which apply over the full operating temperature range.

**Note 1:** Typical parameters are defined as the 60% yield of parameter distributions of individual amplifiers; i.e., out of 100 LT1127s (or 100 LT1126s) typically 240 op amps (or 120) will be better than the indicated specification.

**Note 2:** This parameter is 100% tested for each individual amplifier.

**Note 3:** This parameter is sample tested only.

**Note 4:** This parameter is not 100% tested.

**Note 5:** The inputs are protected by back-to-back diodes. Current limiting resistors are not used in order to achieve low noise. If differential input voltage exceeds ±1.4V, the input current should be limited to 25mA.

**Note 6:** Slew rate is measured in $A_V$ = –10; input signal is ±1V, output measured at ±5V.

**Note 7:** 0.1Hz to 10Hz noise can be inferred from the 10Hz noise voltage density test. See the test circuit and frequency response curve for 0.1Hz to 10Hz tester in the Applications Information section of the LT1007 or LT1028 datasheets.

**Note 8:** This parameter is guaranteed but not tested.

**Note 9:** The LT1126 and LT1127 are not tested and are not quality assurance sampled at –40°C and at 85°C. These specifications are guaranteed by design, correlation and/or inference from –55°C, 0°C, 25°C, 70°C and/or 125°C tests.

## ELECTRICAL CHARACTERISTICS $V_S = \pm 15V$, $0°C \le T_A \le 70°C$, unless otherwise noted.

| SYMBOL | PARAMETER | CONDITIONS (Note 1) | | LT1126AC LT1127AC MIN | LT1126AC LT1127AC TYP | LT1126AC LT1127AC MAX | LT1126C LT1127C MIN | LT1126C LT1127C TYP | LT1126C LT1127C MAX | UNITS |
|---|---|---|---|---|---|---|---|---|---|---|
| $V_{OS}$ | Input Offset Voltage | LT1126 | ● | | 35 | 120 | | 45 | 170 | µV |
| | | LT1127 | ● | | 40 | 140 | | 50 | 210 | µV |
| $\Delta V_{OS}/\Delta T$ | Average Input Offset Voltage Drift | (Note 4) | ● | | 0.3 | 1.0 | | 0.4 | 1.5 | µV/°C |
| $I_{OS}$ | Input Offset Current | LT1126 | ● | | 6 | 25 | | 7 | 35 | nA |
| | | LT1127 | ● | | 7 | 35 | | 8 | 45 | nA |
| $I_B$ | Input Bias Current | | ● | | ±8 | ±35 | | ±9 | ±45 | nA |
| $V_{CM}$ | Input Voltage Range | | ● | ±11.5 | ±12.4 | | ±11.5 | ±12.4 | | V |
| CMRR | Common Mode Rejection Ratio | $V_{CM} = \pm 11.5V$ | ● | 109 | 125 | | 102 | 122 | | dB |
| PSRR | Power Supply Rejection Ratio | $V_S = \pm 4V$ to $\pm 18V$ | ● | 112 | 125 | | 107 | 122 | | dB |
| $A_{VOL}$ | Large Signal Voltage Gain | $R_L \ge 10k\Omega$, $V_O = \pm 10V$ | ● | 4.0 | 15.0 | | 2.5 | 14.0 | | V/µV |
| | | $R_L \ge 2k\Omega$, $V_O = \pm 10V$ | ● | 1.5 | 3.5 | | 1.0 | 2.5 | | V/µV |
| $V_{OUT}$ | Maximum Output Voltage Swing | $R_L \ge 2k\Omega$ | ● | ±12.5 | ±13.7 | | ±12.0 | ±13.7 | | V |
| SR | Slew Rate | $R_L \ge 2k\Omega$ (Notes 2 and 6) | ● | 7.5 | 10.5 | | 7.3 | 10.5 | | V/µs |
| $I_S$ | Supply Current Per Amplifier | | ● | | 2.7 | 3.3 | | 2.7 | 3.3 | mA |

## ELECTRICAL CHARACTERISTICS $V_S = \pm 15V$, $-40°C \le T_A \le 85°C$, unless otherwise noted. (Note 9)

| SYMBOL | PARAMETER | CONDITIONS (Note 1) | | LT1126AC LT1127AC MIN | LT1126AC LT1127AC TYP | LT1126AC LT1127AC MAX | LT1126C LT1127C MIN | LT1126C LT1127C TYP | LT1126C LT1127C MAX | UNITS |
|---|---|---|---|---|---|---|---|---|---|---|
| $V_{OS}$ | Input Offset Voltage | LT1126 | ● | | 40 | 140 | | 50 | 200 | µV |
| | | LT1127 | ● | | 45 | 160 | | 55 | 240 | µV |
| $\Delta V_{OS}/\Delta T$ | Average Input Offset Voltage Drift | | ● | | 0.3 | 1.0 | | 0.4 | 1.5 | µV/°C |
| $I_{OS}$ | Input Offset Current | LT1126 | ● | | 15 | 40 | | 17 | 55 | nA |
| | | LT1127 | ● | | 15 | 50 | | 17 | 65 | nA |
| $I_B$ | Input Bias Current | | ● | | ±15 | ±50 | | ±17 | ±65 | nA |
| $V_{CM}$ | Input Voltage Range | | ● | ±11.4 | ±12.2 | | ±11.4 | ±12.2 | | V |
| CMRR | Common Mode Rejection Ratio | $V_{CM} = \pm 11.4V$ | ● | 107 | 124 | | 101 | 121 | | dB |
| PSRR | Power Supply Rejection Ratio | $V_S = \pm 4V$ to $\pm 18V$ | ● | 111 | 124 | | 106 | 121 | | dB |
| $A_{VOL}$ | Large Signal Voltage Gain | $R_L \ge 10k\Omega$, $V_O = \pm 10V$ | ● | 3.5 | 12.0 | | 2.2 | 12.0 | | V/µV |
| | | $R_L \ge 2k\Omega$, $V_O = \pm 10V$ | ● | 1.2 | 3.2 | | 0.8 | 2.3 | | V/µV |
| $V_{OUT}$ | Maximum Output Voltage Swing | $R_L \ge 2k\Omega$ | ● | ±12.5 | ±13.6 | | ±12.0 | ±13.6 | | V |
| SR | Slew Rate | $R_L \ge 2k\Omega$ (Note 6) | ● | 7.3 | 10.2 | | 7.1 | 10.2 | | V/µs |
| $I_S$ | Supply Current Per Amplifier | | ● | | 2.8 | 3.4 | | 2.8 | 3.4 | mA |

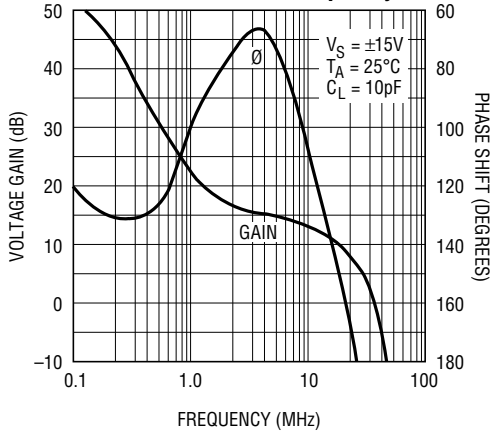
## TYPICAL PERFORMANCE CHARACTERISTICS

The typical behavior of many LT1126/LT1127 parameters is identical to the LT1124/LT1125. Please refer to the LT1124/LT1125 data sheet for the following performance characteristics:

**0.1Hz to 10Hz Voltage Noise**
**0.01Hz to 1Hz Voltage Noise**
**Current Noise vs Frequency**
**Input Bias or Offset Current vs Temperature**
**Output Short Circuit Current vs Time**
**Input Bias Current Over the Common Mode Range**
**Voltage Gain vs Temperature**
**Input Offset Voltage Drift Distribution**
**Offset Voltage Drift with Temperature of Representative Units**
**Output Voltage Swing vs Load Current**
**Common Mode Limit vs Temperature**
**Channel Separation vs Frequency**
**Warm-Up Drift**
**Power Supply Rejection Ratio vs Frequency**

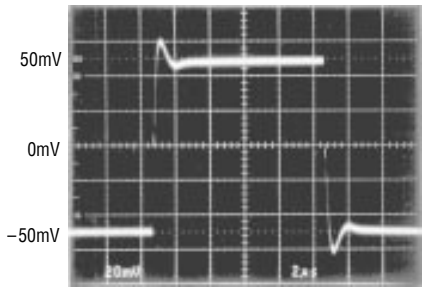
# TYPICAL PERFORMANCE CHARACTERISTICS

### Gain, Phase Shift vs Frequency




LT1126 • TPC01

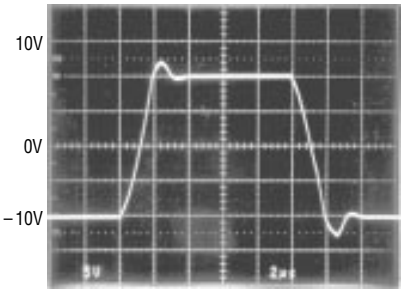
### Small-Signal Transient Response




$A_{VCL}$ = –10V
$V_S$ = ±15V OR ±5V
$C_L$ = 15pF

LT1126 • TPC02

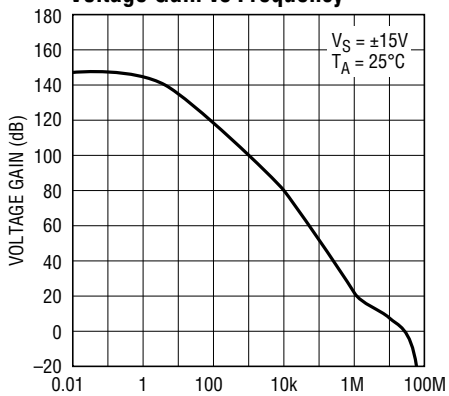
### Large-Signal Transient Response




$A_{VCL}$ = –10V
$V_S$ = ±15V

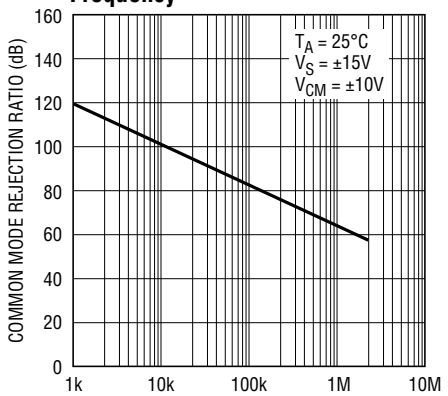
LT1126 • TPC03

### Voltage Gain vs Frequency



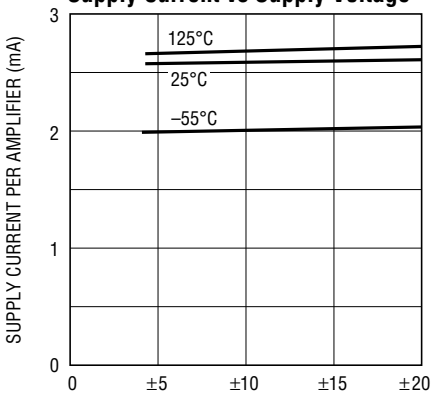

LT1126 • TPC04

### Common Mode Rejection Ratio vs Frequency



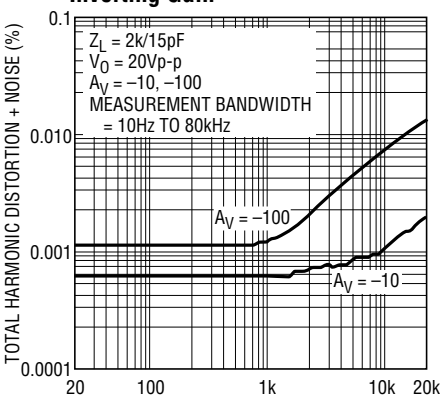

LT1126 • TPC05

### Supply Current vs Supply Voltage



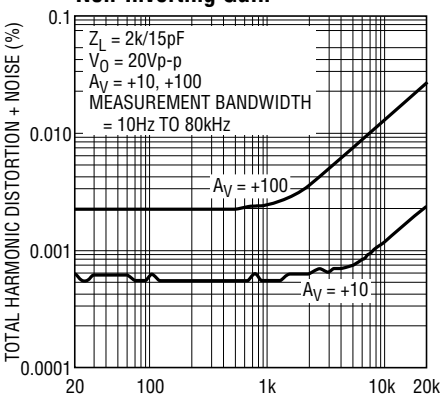

LT1126 • TPC06A

### Total Harmonic Distortion and Noise vs Frequency for Inverting Gain



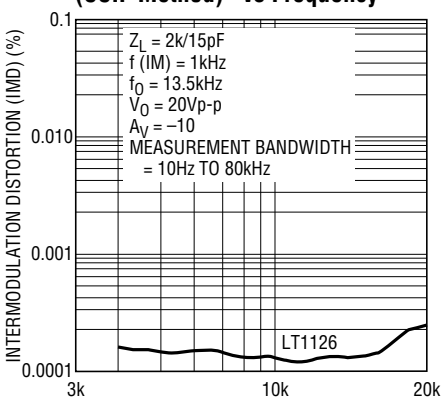

LT1126 • TPC07

### Total Harmonic Distortion and Noise vs Frequency for Non-Inverting Gain




LT1126 • TPC08

### Intermodulation Distortion (CCIF Method)* vs Frequency




LT1126 • TPC09

*See LT1115 data sheet for definition of CCIF testing

# APPLICATIONS INFORMATION

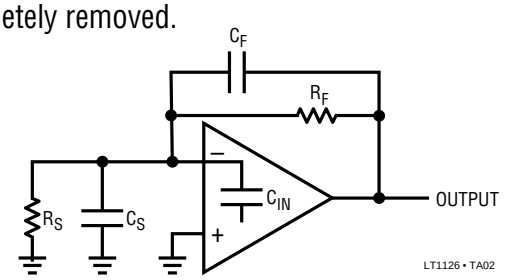
### Matching Specifications

In many applications the performance of a system depends on the matching between two op amps, rather than the individual characteristics of the two devices. The three op amp instrumentation amplifier configuration shown in this data sheet is an example. Matching characteristics are not 100% tested on the LT1126/LT1127.

Some specifications are guaranteed by definition. For example, 70μV maximum offset voltage implies that mismatch cannot be more than 140μV. 112dB (= 2.5μV/V) CMRR means that worst case CMRR match is 106dB (5μV/V). However, the following table can be used to estimate the expected matching performance between the two sides of the LT1126, and between amplifiers A and D, and between amplifiers B and C of the LT1127.

### High Speed Operation

When the feedback around the op amp is resistive ($R_F$), a pole will be created with $R_F$, the source resistance and capacitance ($R_S$, $C_S$), and the amplifier input capacitance ($C_{IN} \approx 2pF$). In low closed loop gain configurations and with $R_S$ and $R_F$ in the kilohm range, this pole can create excess phase shift and even oscillation. A small capacitor ($C_F$) in parallel with $R_F$ eliminates this problem. With $R_S$ ($C_S$ + $C_{IN}$) = $R_F C_F$, the effect of the feedback pole is completely removed.

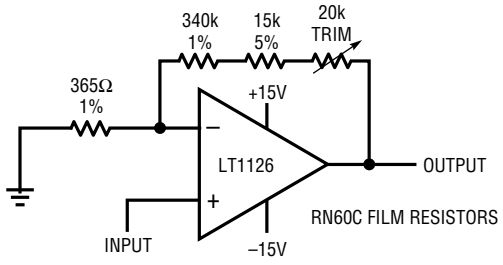



**Expected Match**

| PARAMETER | | LT1126AM/AC LT1127AM/AC 50% YIELD | LT1126AM/AC LT1127AM/AC 98% YIELD | LT1126M/C LT1127M/C 50% YIELD | LT1126M/C LT1127M/C 98% YIELD | UNITS |
|---|---|---|---|---|---|---|
| $V_{OS}$ Match, $\Delta V_{OS}$ | LT1126 | 20 | 110 | 30 | 130 | μV |
| | LT1127 | 30 | 150 | 50 | 180 | μV |
| Temperature Coefficient Match | | 0.35 | 1.0 | 0.5 | 1.5 | μV/°C |
| Average Non-Inverting $I_B$ | | 6 | 18 | 7 | 25 | nA |
| Match of Non-Inverting $I_B$ | | 7 | 22 | 8 | 30 | nA |
| CMRR Match | | 126 | 115 | 123 | 112 | dB |
| PSRR Match | | 127 | 118 | 127 | 114 | dB |

# TYPICAL APPLICATIONS

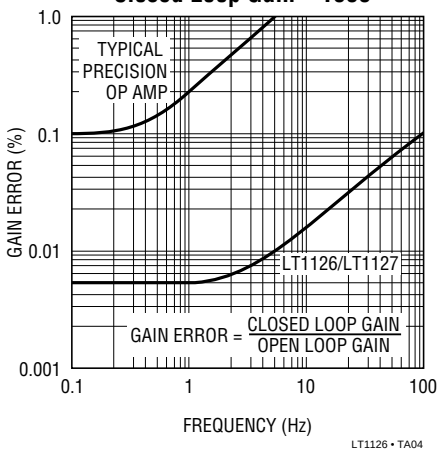
**Gain 1000 Amplifier with 0.01% Accuracy, DC to 5Hz**




THE HIGH GAIN AND WIDE BANDWIDTH OF THE LT1126/LT1127 IS USEFUL IN LOW FREQUENCY HIGH CLOSED LOOP GAIN AMPLIFIER APPLICATIONS. A TYPICAL PRECISION OP AMP MAY HAVE AN OPEN LOOP GAIN OF ONE MILLION WITH 500kHz BANDWIDTH. AS THE GAIN ERROR PLOT SHOWS, THIS DEVICE IS CAPABLE OF 0.1% AMPLIFYING ACCURACY UP TO 0.3Hz ONLY. EVEN INSTRUMENTATION RANGE SIGNALS CAN VARY AT A FASTER RATE. THE LT1126/LT1127 "GAIN PRECISION — BANDWIDTH PRODUCT" IS 330 TIMES HIGHER, AS SHOWN.

LT1126 • TA03

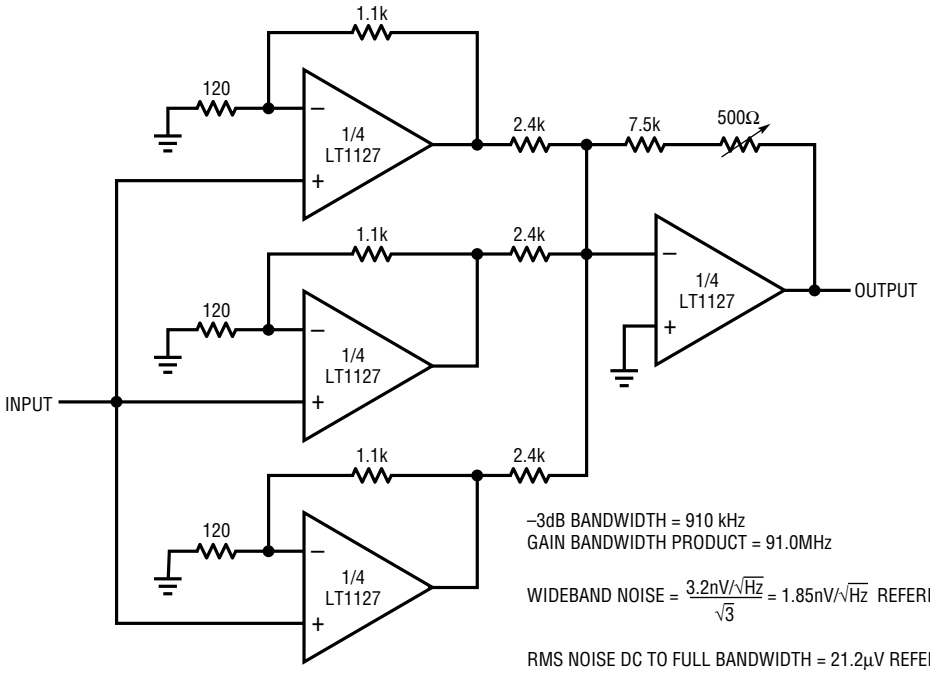
**Gain Error vs Frequency**
**Closed Loop Gain = 1000**




LT1126 • TA04

# TYPICAL APPLICATIONS

**Low Noise, Wideband, Gain = 100 Amplifier with High Input Impedance**



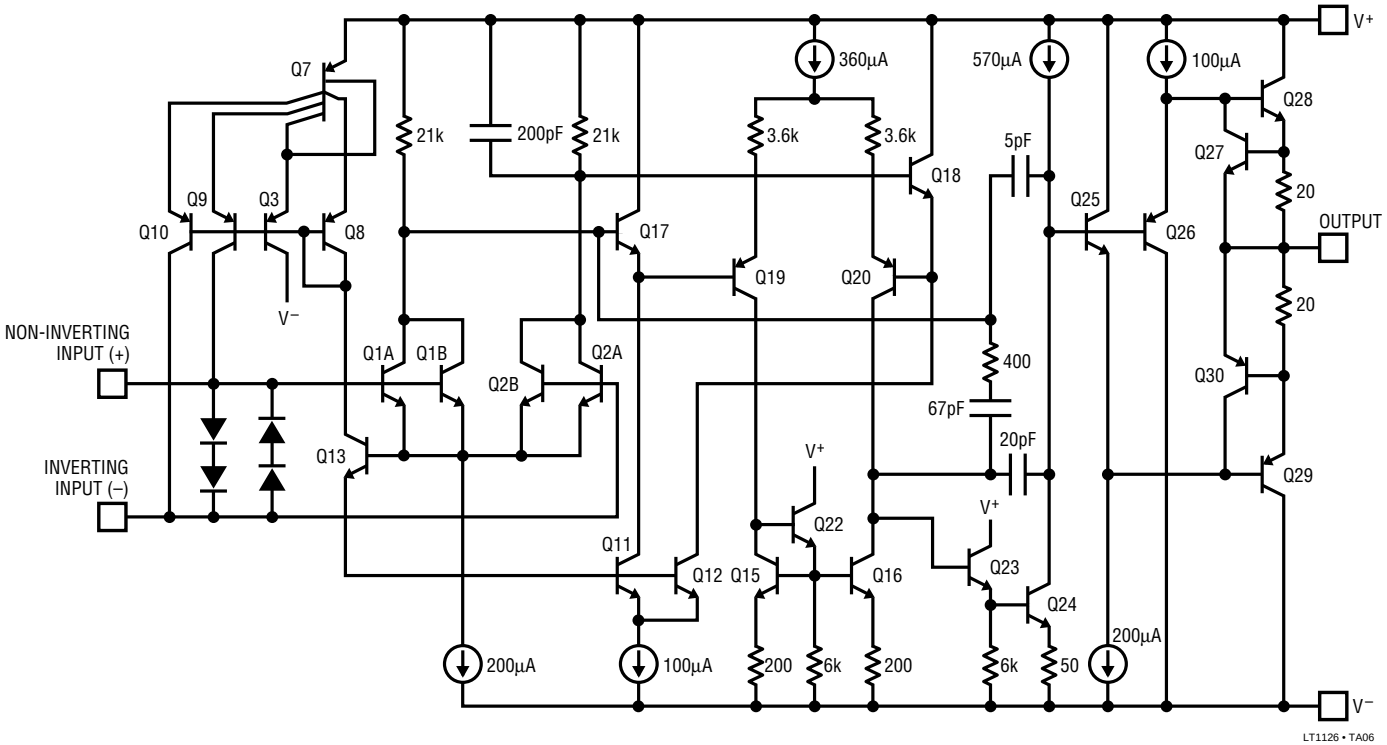

–3dB BANDWIDTH = 910 kHz
GAIN BANDWIDTH PRODUCT = 91.0MHz

WIDEBAND NOISE = $\frac{3.2nV/\sqrt{Hz}}{\sqrt{3}} = 1.85nV/\sqrt{Hz}$ REFERRED TO INPUT

RMS NOISE DC TO FULL BANDWIDTH = 21.2µV REFERRED TO INPUT

LT1126 • TA05

# SCHEMATIC DIAGRAM (1/2 LT1126, 1/4 LT1127)




LT1126 • TA06

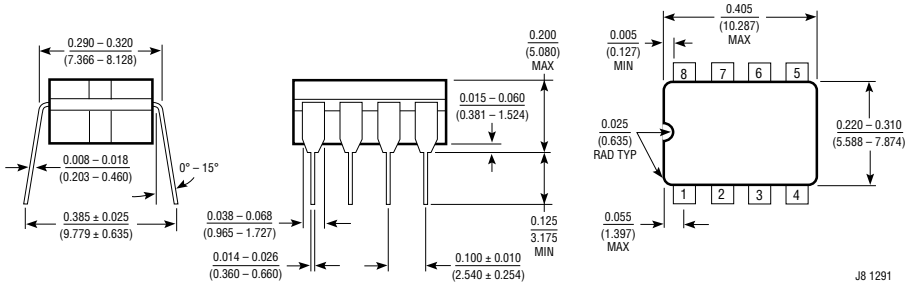
LINEAR TECHNOLOGY

Information furnished by Linear Technology Corporation is believed to be accurate and reliable. However, no responsibility is assumed for its use. Linear Technology Corporation makes no representation that the interconnection of its circuits as described herein will not infringe on existing patent rights.

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

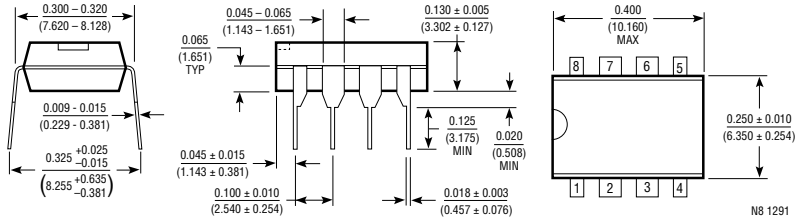
### J8 Package
### 8-Lead Ceramic DIP

| $T_{J\,MAX}$ | $\theta_{JA}$ |
|---|---|
| 160°C | 100°C/W |



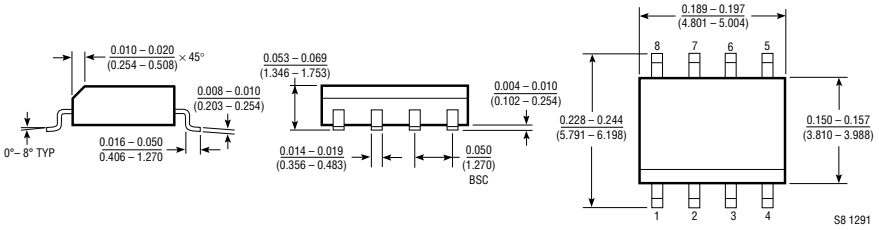

### N8 Package
### 8-Lead Plastic DIP

| $T_{J\,MAX}$ | $\theta_{JA}$ |
|---|---|
| 140°C | 130°C/W |



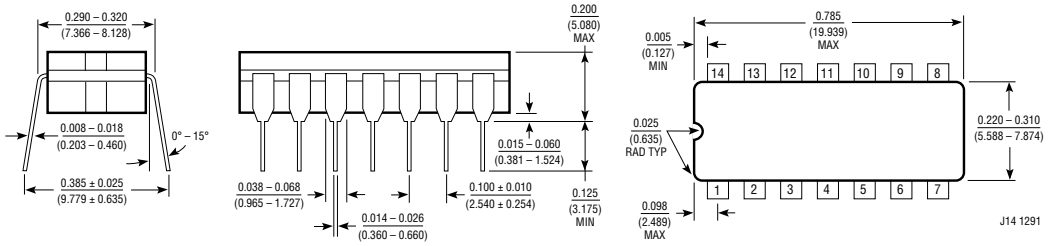

### S8 Package
### 8-Lead Plastic SOIC

| $T_{J\,MAX}$ | $\theta_{JA}$ |
|---|---|
| 140°C | 190°C/W |



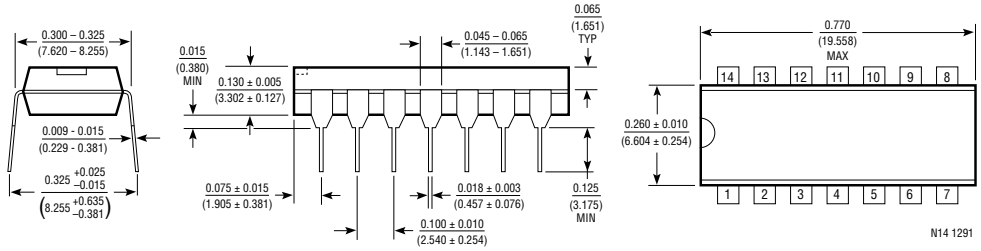

### J Package
### 14-Lead Ceramic DIP

| $T_{J\,MAX}$ | $\theta_{JA}$ |
|---|---|
| 160°C | 80°C/W |



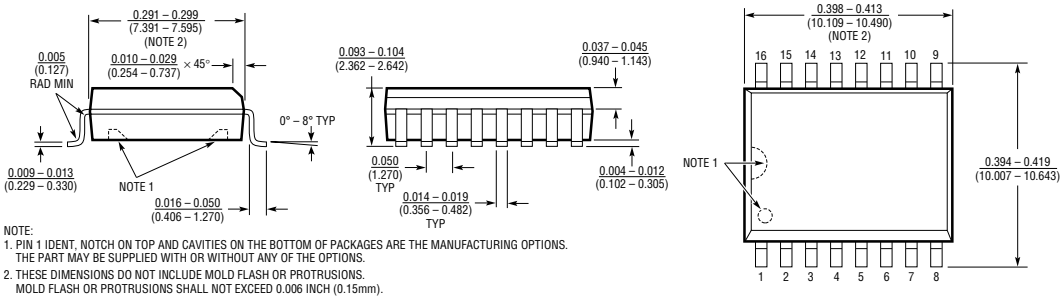

### N Package
### 14-Lead Plastic DIP

| $T_{J\,MAX}$ | $\theta_{JA}$ |
|---|---|
| 140°C | 110°C/W |




### SOL Package
### 16-Lead Plastic SOL

| $T_{J\,MAX}$ | $\theta_{JA}$ |
|---|---|
| 140°C | 130°C/W |




NOTE:
1. PIN 1 IDENT, NOTCH ON TOP AND CAVITIES ON THE BOTTOM OF PACKAGES ARE THE MANUFACTURING OPTIONS. THE PART MAY BE SUPPLIED WITH OR WITHOUT ANY OF THE OPTIONS.
2. THESE DIMENSIONS DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED 0.006 INCH (0.15mm).



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