INA826 Precision, 200-µA Supply Current, 3-V to 36-V Supply Instrumentation Amplifier With Rail-to-Rail Output

1 Features

- Input common-mode range: Includes V–
- Common-mode rejection:
  - 104 dB, min (G = 10)
  - 100 dB, min at 5 kHz (G = 10)
- Power-supply rejection: 100 dB, min (G = 1)
- Low offset voltage: 150 µV, max
- Gain drift: 1 ppm/°C (G = 1), 35 ppm/°C (G > 1)
- Noise: 18 nV/√Hz, G ≥ 100
- Bandwidth: 1 MHz (G = 1), 60 kHz (G = 100)
- Inputs protected up to ±40 V
- Rail-to-rail output
- Supply current: 200 µA
- Supply range:
  - Single supply: 3 V to 36 V
  - Dual supply: ±1.5 V to ±18 V
- Specified temperature range: –40°C to +125°C
- Packages: 8-pin VSSOP, SOIC, and WSON

2 Applications

- Analog input module
- Flow transmitter
- Battery test
- LCD test
- Electrocardiogram (ECG)
- Surgical equipment
- Process analytics (pH, gas, concentration, force and humidity)
- Circuit breaker (ACB, MCCB, VCB)

3 Description

The INA826 is a cost-effective instrumentation amplifier that offers extremely low power consumption and operates over a very wide single-supply or dual-supply range. A single external resistor sets any gain from 1 to 1000. The device offers excellent stability over temperature, even at G > 1, as a result of the low gain drift of only 35 ppm/°C (maximum).

The INA826 is optimized to provide excellent common-mode rejection ratio of over 100 dB (G = 10) over frequencies up to 5 kHz. At G = 1, the common-mode rejection ratio exceeds 84 dB across the full input common-mode range, from the negative supply all the way up to 1 V of the positive supply. Using a rail-to-rail output, the INA826 is a great choice for low-voltage operation from a 3-V single supply, as well as dual supplies up to ±18 V.

Additional circuitry protects the inputs against overvoltage of up to ±40 V beyond the power supplies by limiting the input currents to less than 8 mA.

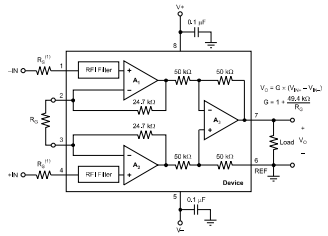
The INA826 is available in 8-pin SOIC, VSSOP, and tiny 3-mm × 3-mm WSON surface-mount packages. All versions are specified for the –40°C to +125°C temperature range.

Device Information[1]

PART NUMBER	PACKAGE	BODY SIZE (NOM)
INA826	SOIC (8)	4.90 mm × 3.91 mm
	WSON (8)	3.00 mm × 3.00 mm
	VSSOP (8)	3.00 mm × 3.00 mm

(1) For all available packages, see the package option addendum at the end of the data sheet.

General-Purpose Instrumentation Amplifier



(1) This resistor is optional if the input voltage stays above [(V–) – 2 V] or if the signal source current drive capability is limited to less than 3.5 mA; see the *Input Protection* section for more details.

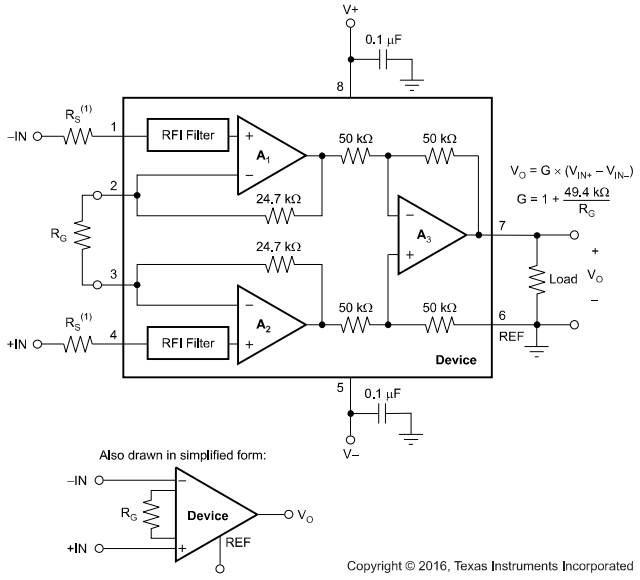
8 Detailed Description

8.1 Overview

The *Functional Block Diagram* section shows the basic connections required for operation of the INA826. Good layout practice mandates the use of bypass capacitors placed as close to the device pins as possible.

The output of the INA826 is referred to the output reference (REF) terminal, which is normally grounded. This connection must be low-impedance to maintain good common-mode rejection. Although 5 Ω or less of stray resistance can be tolerated when maintaining specified CMRR, small stray resistances of tens of ohms in series with the REF pin can cause noticeable degradation in CMRR.

8.2 Functional Block Diagram



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