

ADHV4702-1

24 V to 220 V Precision Operational Amplifier

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Introduction

The **ADHV4702-1** is a high voltage (220 V), unity-gain stable precision operational amplifier. The next generation of proprietary semiconductor processes and innovative architecture from Analog Devices enable this precision operational amplifier to operate from symmetrical dual supplies of ± 110 V, asymmetrical dual supplies, or a single supply of 220 V.

The Industry's First 220 V Precision Operational Amplifier

The ADVH4702-1 has a 170 dB typical open-loop gain (A_{OL}) and a 160 dB typical common-mode rejection ratio (CMRR). The ADVH4702-1 also has a $2 \mu\text{V}/^\circ\text{C}$ maximum input offset voltage (V_{OS}) drift and an $8 \text{ nV}/\sqrt{\text{Hz}}$ input voltage noise. The exceptional dc precision of the ADVH4702-1 is complemented by excellent dynamic performance with a small signal bandwidth of 10 MHz and a slew rate of $74 \text{ V}/\mu\text{s}$. The ADVH4702-1 has an output current of 20 mA typical. In addition, its unique features such as adjustable supply current, slew boosting circuitry, and flexible exposed pad bias voltage make this part the ideal high voltage solution for a wide range of applications.

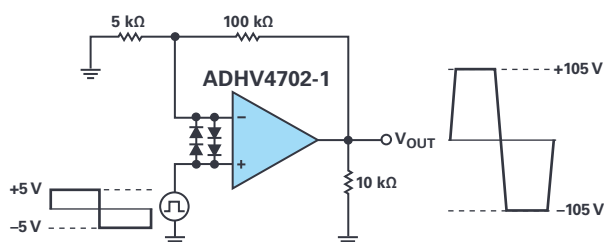


Figure 1. ADVH4702-1 output swing circuit and capability.

Applications

ADHV4702-1 is the first amplifier in the market that offers high voltage and precision performance in a small form factor. The ADVH4702-1 solves difficult design challenges and can be used in many different applications such as automated test equipment, life sciences, LIDAR, and healthcare. In automated test equipment applications, the device can be used for high-side current measurement and high voltage precision supply generation. For life sciences, the ADVH4702-1 can be used to provide precision high voltage control for mass spectrometry systems. In LIDAR applications, it can be used to accurately control the APD bias voltage. In healthcare applications, the product can be used to tightly control the bias point of silicon photomultipliers.

12-Lead, 7 mm × 7 mm LFCSP Compliant with IEC 61010-1 Spacing

The ADVH4702-1 is available in a 12-lead, 7 mm × 7 mm lead frame chip scale package (LFCSP) with an exposed pad compliant to International Electrotechnical Commission IEC 61010-1 creepage and clearance standards. This package significantly reduces the solution size and simplifies system architectures by eliminating supporting components like dc-to-dc converters and floating supplies.

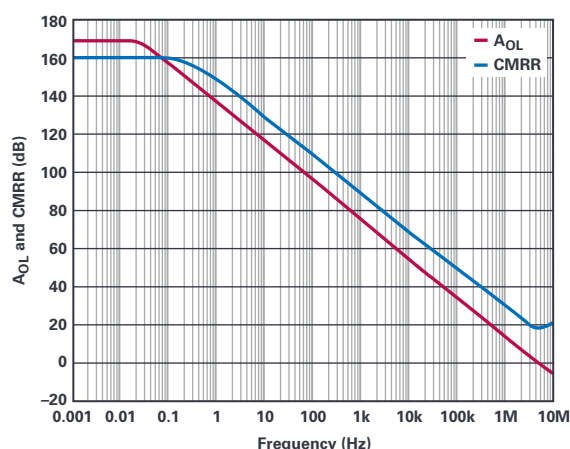


Figure 2. ADVH4702-1 precision performance.

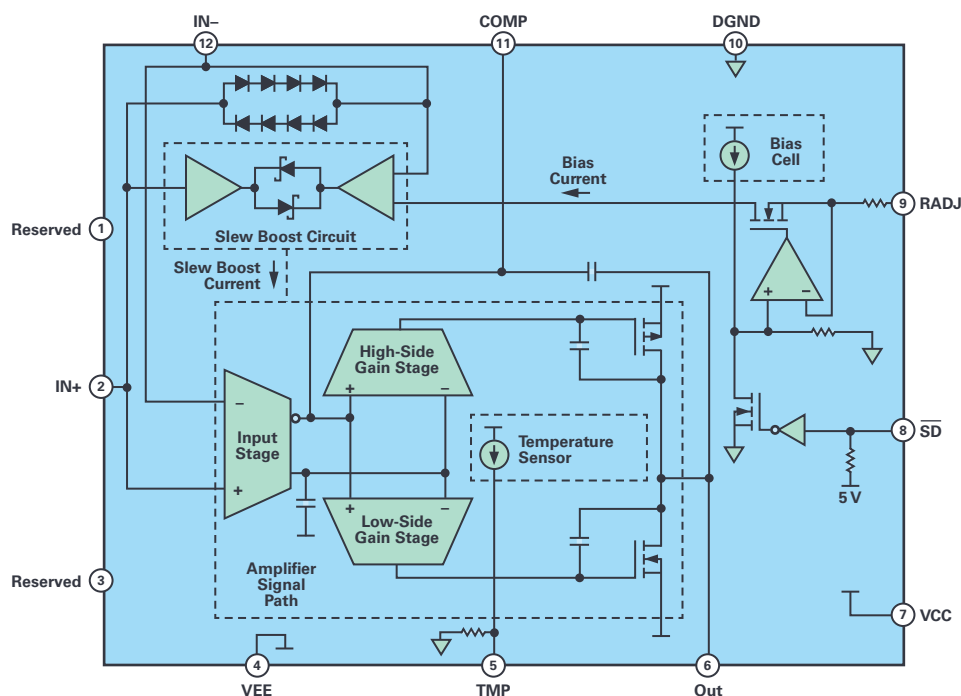
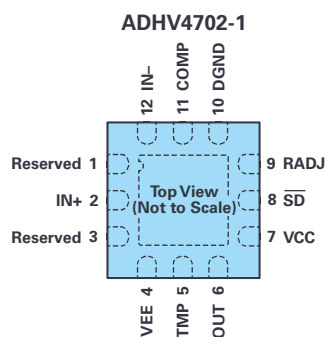


Figure 3. ADHV4702-1 functional block diagram.



Notes:
 1. Reserved. These pins are internally connected. Float or tie these pins to the digital ground.
 2. Exposed thermal pad. No internal electrical connection. Tie EPAD to external ground plane and/or heat sink for thermal management.

Figure 4. ADHV4702-1 pin configuration.

About the Author

Yihang Yang is an applications engineer in ADI's Linear Precision Solution Group, where she focuses on high voltage amplifiers and signal chains. She received her B.S. in electrical engineering from Arizona State University. She can be reached at yihang.yang@analog.com.

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