

AD5382	32 通道、14 位、3 V/5 V 单电源 DAC
ADR421	低噪声、2.500 V XFET®基准电压源
ADR431	超低噪声 XFET 基准电压源

## 利用 AD5382 DAC 实现 32 通道可编程电压以及出色的温度漂移性能

### 电路功能与优势

本电路为多通道 DAC 配置, 具有出色的温度漂移性能。它提供 32 个独立电压通道, 分辨率为 14 位, 温度稳定性典型值低于 3 ppm/°C。

### 电路描述

图 1 显示采用外部基准电压源的 AD5382 典型配置。在所示电路中, 所有 AGND、SIGNAL\_GND 和 DAC\_GND 引脚均连在一起, 并与一个公共 AGND 引脚相连。在 AD5382 器件上, AGND 与 DGND 连在一起。上电时, AD5382 默认采用外部基准电压源工作。

此设计使用两个独立的 5.0 V 电源, 一个电源为基准电压源和 AD5382 的模拟部分(AVDD)供电, 另一个电源为 AD5382 的数字部分(DVDD)供电。为获得最佳性能, 务必使用线性稳压器驱动电路的模拟部分。如果用开关稳压器驱动数字部分, 应注意将 DVDD 电源引脚上的开关噪声降至最低。可能还需要利用串联的铁氧体磁珠进行额外去耦。AD5382 数字(DVDD)电源可以采用 3 V 或 5 V 电源, 与数字元件接口时, 这种电源可以带来极大的灵活性。如果电源从线性稳压器获得, 则两个电源引脚可连在一起, 并连至共同的 5 V 电源。有关电源设计的指导信息, 请参考 [ADIsimPower™](#) 设计工具。

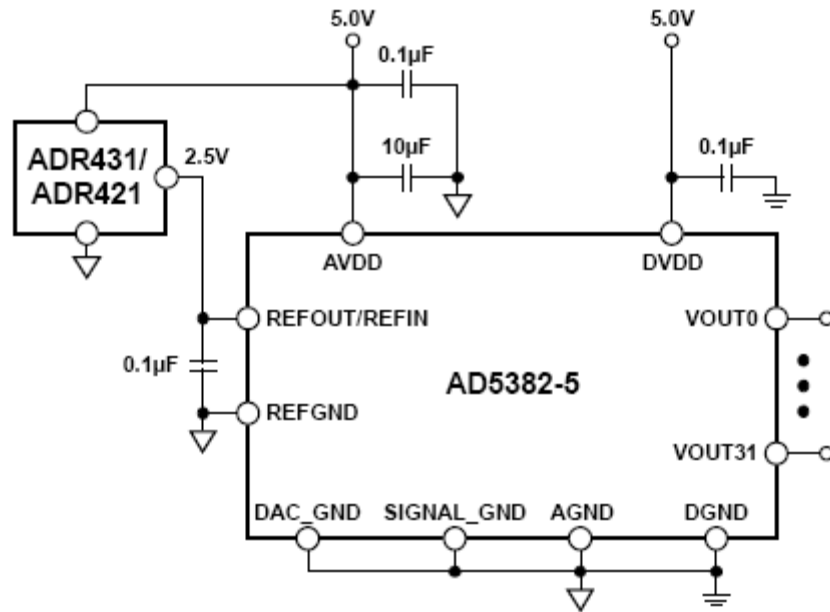


图 1. 采用外部基准电压源的 AD5382 典型配置 (原理示意图)

Rev.A

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建议使用 0.1  $\mu\text{F}$  陶瓷电容和 10  $\mu\text{F}$  钽电容，对靠近器件的电源去耦。本电路中，AD5382 的基准电压从 2.5 V 外部基准电压源 ADR421 或 ADR431 获得。ADR431 具有较低的输出电压噪声，适合特别注重这一特性的应用。应使用 0.1  $\mu\text{F}$  电容在器件的 REFOUT/REFIN 引脚对基准电压源去耦。

### 常见变化

该电路的一种变化形式是 AD5382-3 采用 1.2 V 基准电压源 ADR280，所有其它连接和元件均与以上所述相同。

### 进一步阅读

[ADIsimPower Design Tool](#).

Kester, Walt. 2005. *The Data Conversion Handbook*. Analog Devices. Chapters 3 and 7.

MT-015 Tutorial, *Basic DAC Architectures II: Binary DACs*. Analog Devices.

MT-031 Tutorial, *Grounding Data Converters and Solving the Mystery of AGND and DGND*. Analog Devices.

MT-101 Tutorial, *Decoupling Techniques*. Analog Devices.  
Voltage Reference Wizard Design Tool.

### 数据手册和评估板

[AD5382 Data Sheet](#).

[AD5382 Evaluation Board](#).

[ADR421 Data Sheet](#).

[ADR431 Data Sheet](#).

### 修订历史

**5/09—Rev. 0 to Rev. A**

Updated Format ..... Universal

**10/08—Revision 0: Initial Version**

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