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连接/参考器件

AD5754	完整的四通道、16 位、单极性/双极性电压输出 DAC
REF192	2.5 V 精密基准电压源

利用 AD5754 DAC 提供软件可配置的 16 位、四通道、单极性/双极性电压输出

电路功能与优势

本电路采用四通道、16 位、串行输入、单极性/双极性电压输出 DAC AD5754BREZ 及 2.5 V 精密基准电压源 REF192ESZ，可提供单极性和双极性数据转换。该 16 位 DAC 电路所需的附加外部器件只有电源引脚和基准输入上的去耦电容，从而可以节省成本和电路板空间。本电路非常适合闭环伺服控制应用。

电路描述

AD5754 是一款数模转换器，可保证 16 位单调性，积分非线性 (INL) 误差为 ± 16 LSB，总非调整误差 (TUE) 为 0.1%，建立时间为 10 μ s。该器件还集成了基准电压缓冲和输出放大器，从而可以进一步节省成本和电路板空间。在以下电源电压范围内能够保证性能：AV_{DD} 电源电压范围为 +4.5 V 至 +16.5 V，AV_{SS} 电源电压范围为 -4.5 V 至 -16.5 V。如果只需要单极性输出，则可以将 AV_{SS} 与 0 V 相连。各通道的输出范围均可独立编程，提供以下选项：0 V 至 +5 V、0 V 至 +10 V、0 V 至 +10.8 V、-5 V 至 +5 V、-10 V 至 +10 V、-10.8 V 至 +10.8 V。对于双极性输出，输入编码方式为用户可选的二进制补码或偏移二进制（取决于 BIN/2sCOMP 引脚的状态）。对于单极性输出，编码方式为标准二进制。图 2 显示，该电路在 25°C 环境温度时的典型输出误差小于 0.06%FSR。

本电路必须构建在具有较大面积接地层的多层电路板上。为实现最佳性能，必须采用适当的布局、接地和去耦技术（请参考教程 MT-031 和教程 MT-101）。

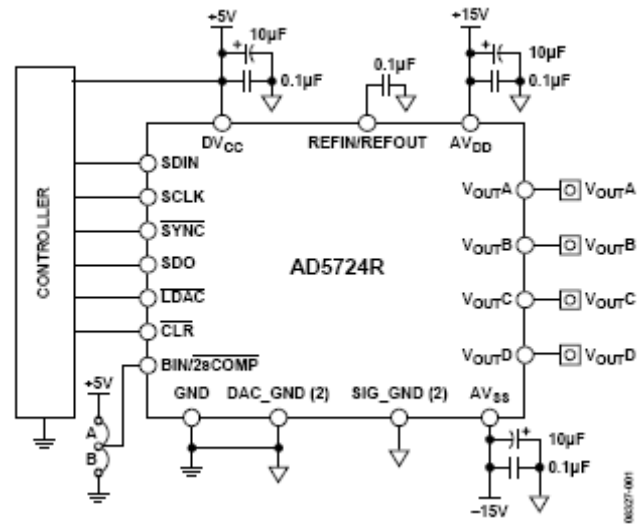


图 1. AD5754 DAC 的单极性/双极性配置（原理示意图）

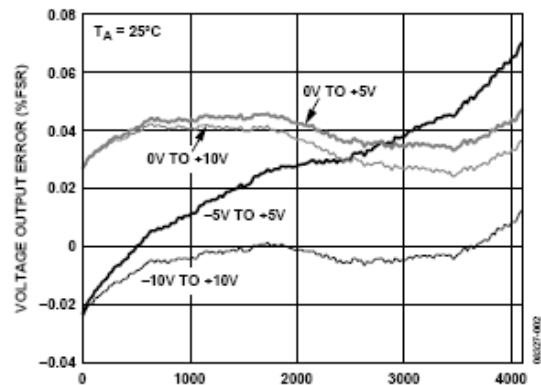


图 2. 电压输出误差

Rev.0

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进一步阅读

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

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

AD5754 Data Sheet.

REF192 Data Sheet.

AD5754R Evaluation Board (Compatible with AD5724R).

修订历史

07/09—Revision 0: Initial Version

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