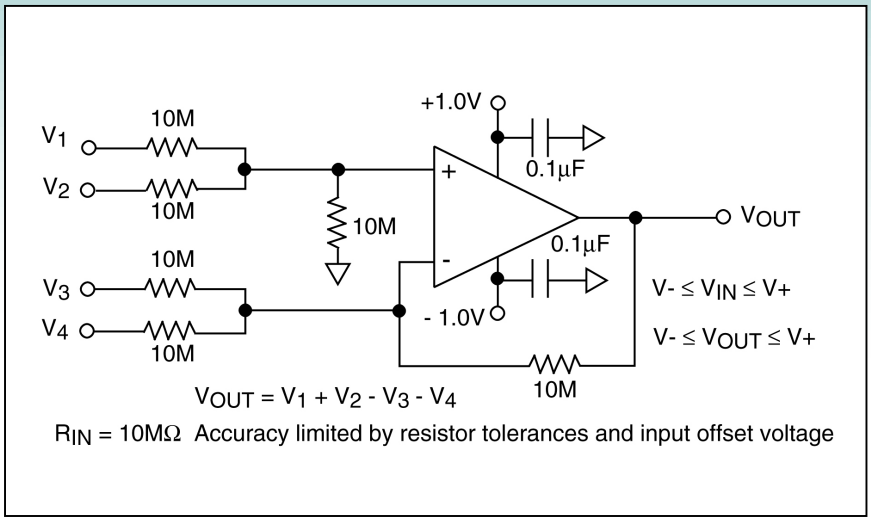
Category: Amplifiers **CIRCUIT IDEAS FOR DESIGNERS** Schematic no. amp_27002.0

Low Voltage High Input Impedance Precision DC Summing Amplifier



Description

This circuit presents a simple low voltage precision DC summing amplifier that has high input impedance of 10Mohm. The obvious advantage here is that the high input resistance of the summing resistor(s) reduces the loading on the input signal sources and therefore affords better signal accuracy and integrity. However, when such high value input resistors are used, the input leakage currents to the operational amplifier must be significantly lower than the lowest input signal currents available so that the accuracy of the summing amplifier is preserved. In this example, a 10Mohm resistor is used as a basic summing amplifier input resistor. To determine an input signal resolution, assume a "signal current" available as equal to 10pA, which computes to 10Mohm x 10pA =100µV. The input leakage current of the operational amplifier therefore limits the input voltage resolution and the minimum discernable voltage signal. A CMOS operational amplifier with very low input-leakage current specifications guaranteed would be required for this type of application. Using the same method of reasoning, a 10µV signal resolution would require either 1pA max. input leakage current or a 1Mohm input resistor instead of a 10Mohm input resistor. This circuit functions with power supplies of +/- 1V.

Recommended Components

ALD1706A, ALD1726, ALD1701A, ALD1721
½ ALD2701A, ½ ALD2706A, ½ ALD2711, ½ ALD2711A

Other Related Circuit Ideas

Schematic no. amp_27001.0 High Input Impedance DC Summing Amplifier
Schematic no. amp_27003.0 High Input Impedance Precision DC Summing Amplifier