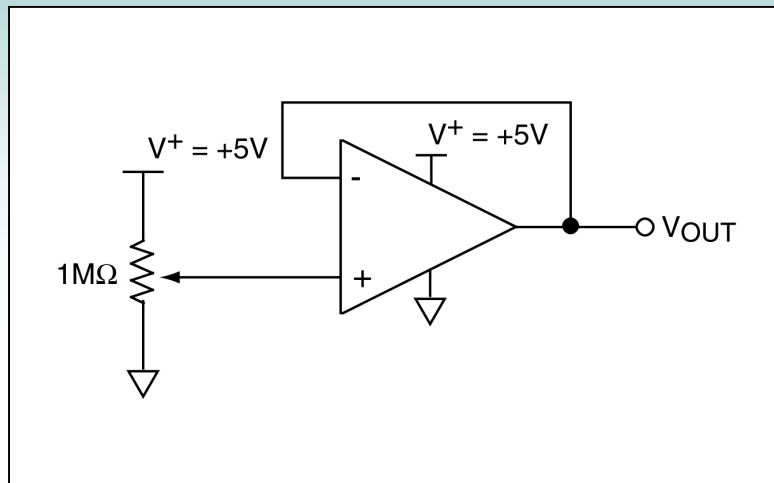**Micropower Buffered Rail-to-Rail Adjustable Voltage Source**

Description

This circuit is a variation to the basic connection of a unity gain buffer amplifier. The unity gain amplifier is used primarily to isolate the input from the output. In this configuration, the output is connected back to the negative input terminal of the amplifier. Therefore any voltage at the output would be forced upon the −ve input as well. As the operational amplifier has very high open loop gain, the output voltage would tend to be forced to a value very close to V_{IN} voltage. Any difference in voltage between the +ve input and the −ve input terminals would result in an equivalent input voltage applied across the inputs of the operational amplifier, which is then amplified by the open loop gain of the operational amplifier. By using a rail-to-rail operational amplifier (see list below), the input voltage V_{IN} can be at any voltage between the V+ and V- supply rails. The output of the rail-to-rail operational amplifier generally has a very low output resistance, which, when connected to a load resistor, would result in an output voltage that can reach from within a few millivolts to a few tenths of millivolts from the supply rails. The actual output voltage achievable depends on the output impedance of the operational amplifier selected and the current it has to supply to the load resistance. Input to the +ve input terminal is set by the potentiometer. The potentiometer can be of almost any value available, due to the high input impedance of the operational amplifier ($R_{IN} > \sim 1000$ Gohm). Generally a potentiometer 1 Mohm or higher is used to limit the power consumption across the potentiometer.

Recommended Components

ALD1701, ALD1706, ALD1721, ALD1726, ½ ALD2711, ½ ALD2701, ½ ALD2706

Other Related Circuit Ideas

Schematic no. vf_27001.0 Rail-to-Rail Voltage Follower/Buffer