

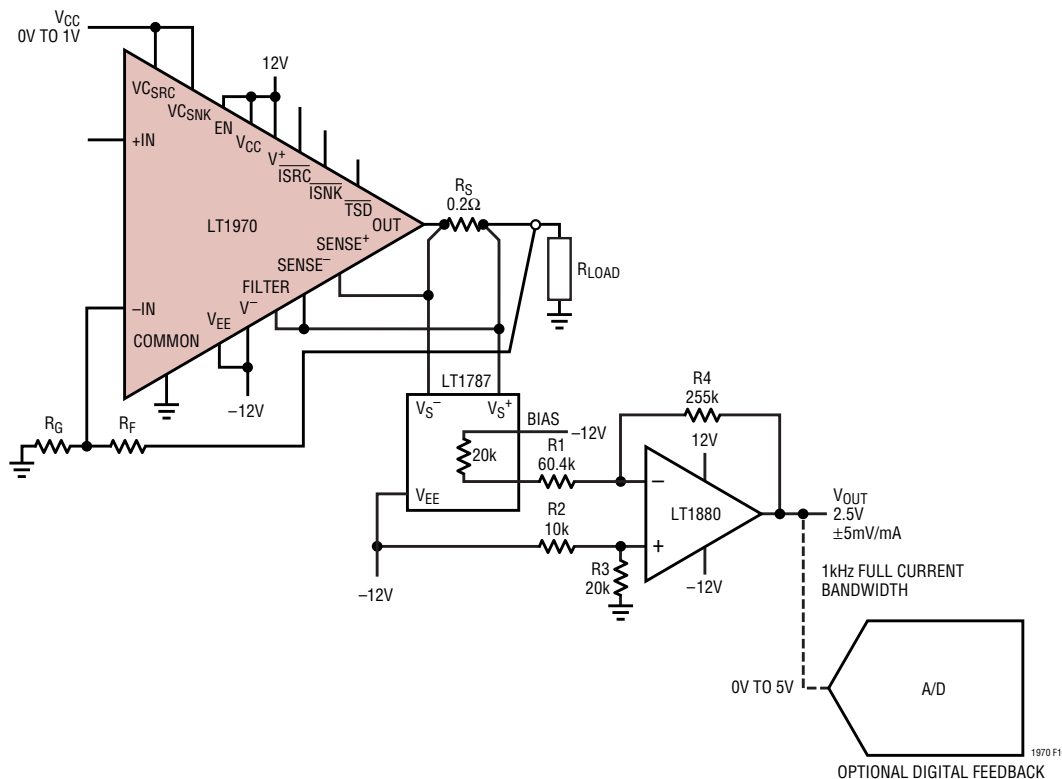
APPLICATION NOTE 105: Current Sense Circuit Collection

Digitizing

In many systems the analog voltage quantity indicating current flow must be input to a system controller. In this chapter several examples of the direct interface of a current sense amplifier to an A to D converter are shown.

To see other chapters in this Application Note, return to the [Introduction](#).

Sensing Output Current

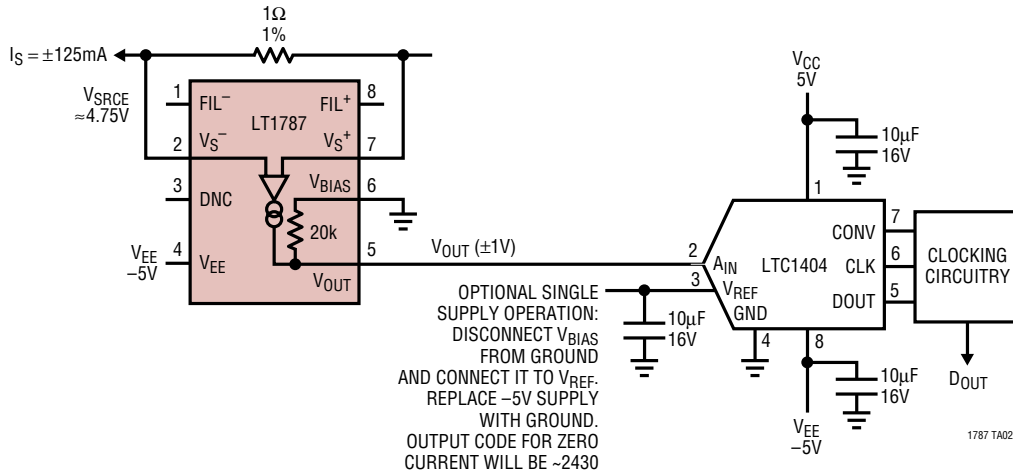


The LT1970 is a 500mA power amplifier with voltage programmable output current limit. Separate DC voltage inputs and an output current sensing resistor control the maximum sourcing and sinking current values. These control voltages could be provided by a D-to-A Converter

in a microprocessor controlled system. For closed loop control of the current to a load an LT1787 can monitor the output current. The LT1880 op amp provides scaling and level shifting of the voltage applied to an A-to-D Converter for a 5mV/mA feedback signal.

APPLICATION NOTE 105: Current Sense Circuit Collection

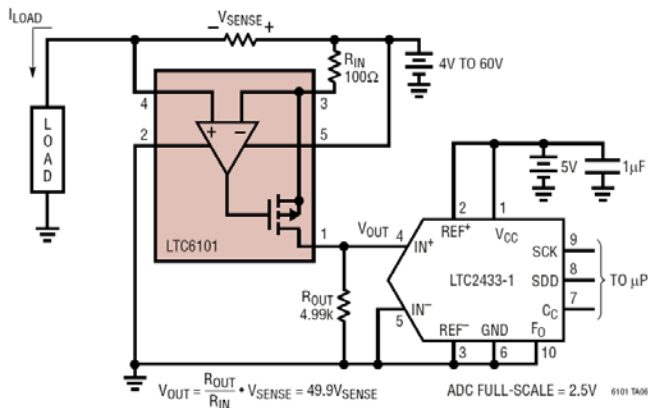
Split or Single Supply Operation, Bidirectional Output into A/D



In this circuit, split supply operation is used on both the LT1787 and LTC1404 to provide a symmetric bidirectional measurement. In the single-supply case, where the

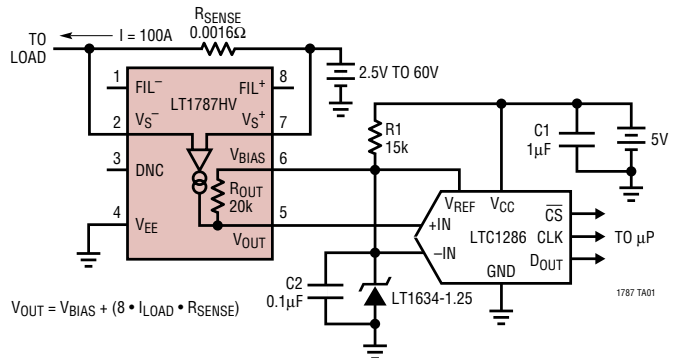
LT1787 pin 6 is driven by V_{REF} , the bidirectional measurement range is slightly asymmetric due to V_{REF} being somewhat greater than mid-span of the ADC input range.

16-Bit Resolution Unidirectional Output into LTC2433 ADC



The LTC2433-1 can accurately digitize signal with source impedances up to 5kΩ. This LTC6101 current sense circuit uses a 4.99kΩ output resistance to meet this requirement, thus no additional buffering is necessary.

12-Bit Resolution Unidirectional Output into LTC1286 ADC



While the LT1787 is able to provide a bidirectional output, in this application the economical LTC1286 is used to digitize a unidirectional measurement. The LT1787 has a nominal gain of eight, providing a 1.25V full-scale output at approximately 100A of load current.