

From AN105-106

Variable Current Source (Figure 193)

A basic high side current source is implemented at the output, while an input translation amplifier section provides for flexible input scaling. A rail-to-rail input capability is required to have both amplifiers in one package, since the input stage has common mode near ground and the second section operates near V_{CC} .

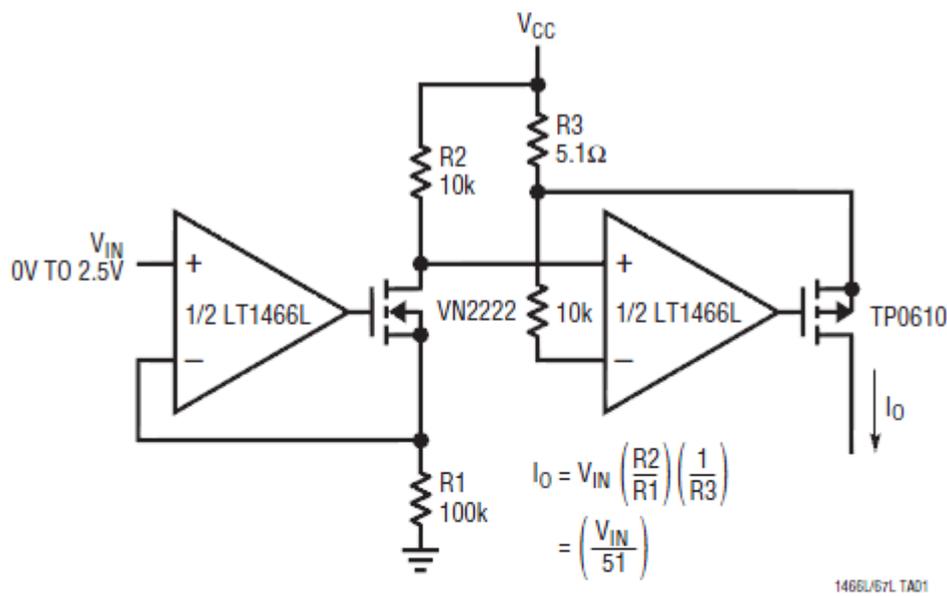


Figure 193. Variable Current Source

Precision Voltage Controlled Current Source (Figure 195)

The ultra-precise LTC2053 instrumentation amplifier is configured to servo the voltage drop on sense resistor R to match the command V_C . The LTC2053 output capability limits this basic configuration to low current applications.

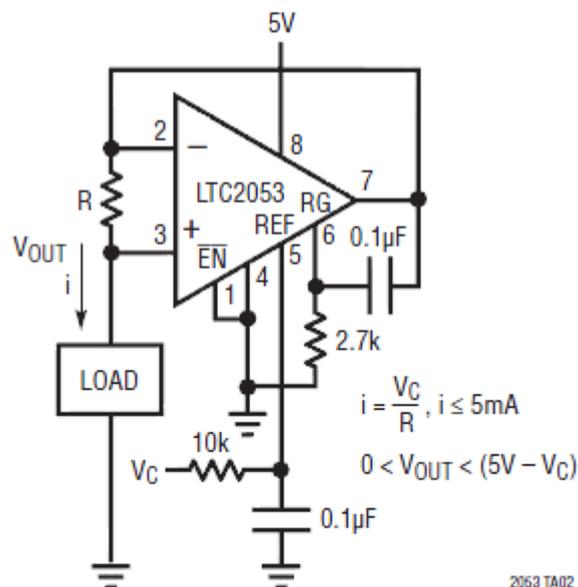


Figure 195. Precision Voltage Controlled Current Source

Switchable Precision Current Source (Figure 196)

This is a simple current-source configuration where the op amp servos to establish a match between the drop on the sense resistor and that of the 1.2V reference. This particular op amp includes a shutdown feature so the current source function can be switched off with a logic command. The 2kΩ pull-up resistor assures the output MOSFET is off when the op amp is in shutdown mode.

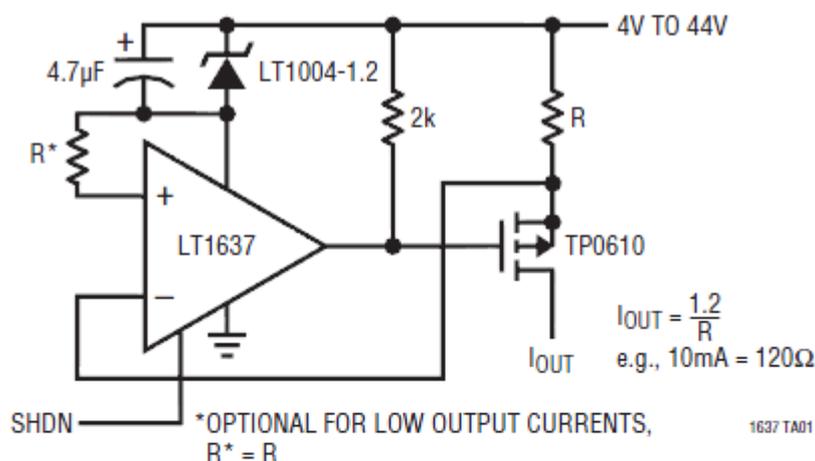


Figure 196. Switchable Precision Current Source

Boosted Bidirectional Controlled Current Source (Figure 197)

This is a classical Howland bidirectional current source implemented with an LT1990 integrated difference amplifier. The op amp circuit serves to match the R_{SENSE} voltage drop to the input command V_{CTL} . When the load current exceeds about 0.7mA in either direction, one of the boost transistors will start conducting to provide the additional commanded current.

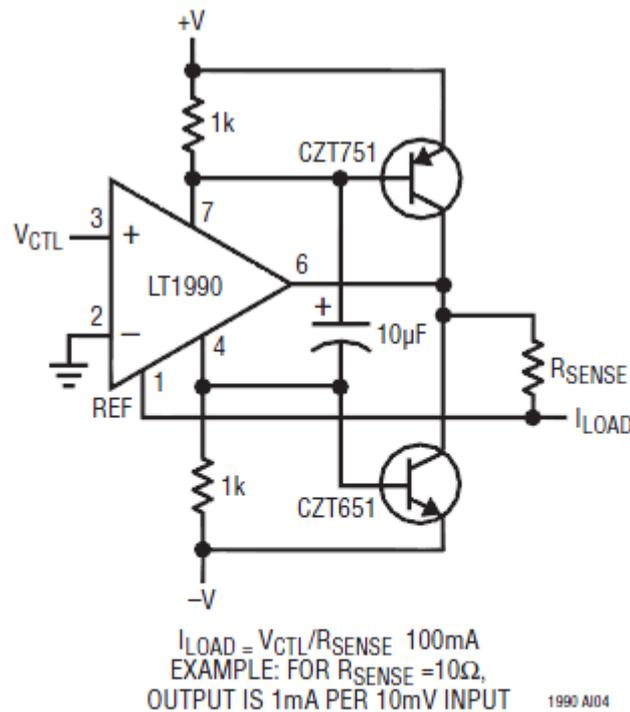
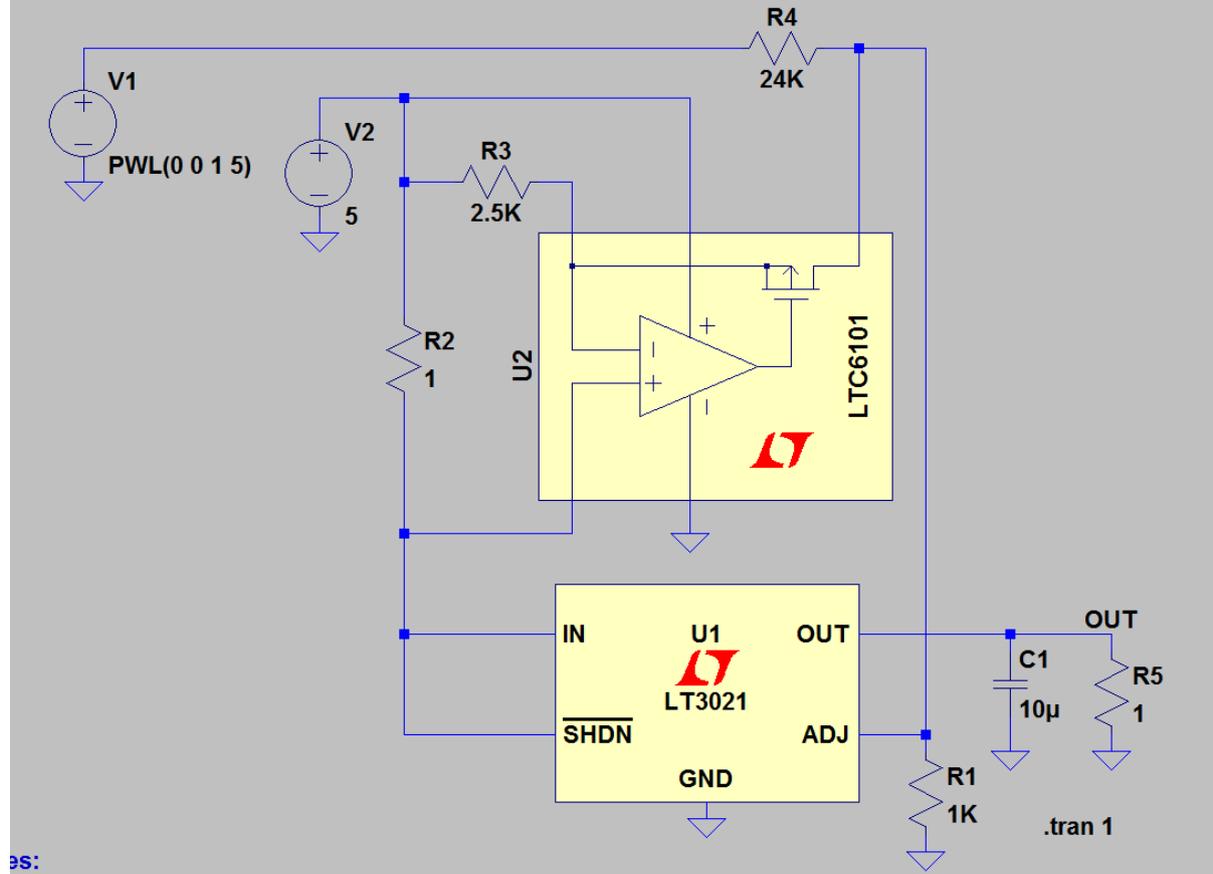


Figure 197. Boosted Bidirectional Controlled Current Source

LTC6101 - High Voltage, High-Side Current Sense Amplifier
LT3021 - 500mA, Low Voltage, Very Low Dropout Linear Regulator
Voltage Controlled Current Source
Input: 0V to 5V Output: 500mA to 0mA, 100mA/V



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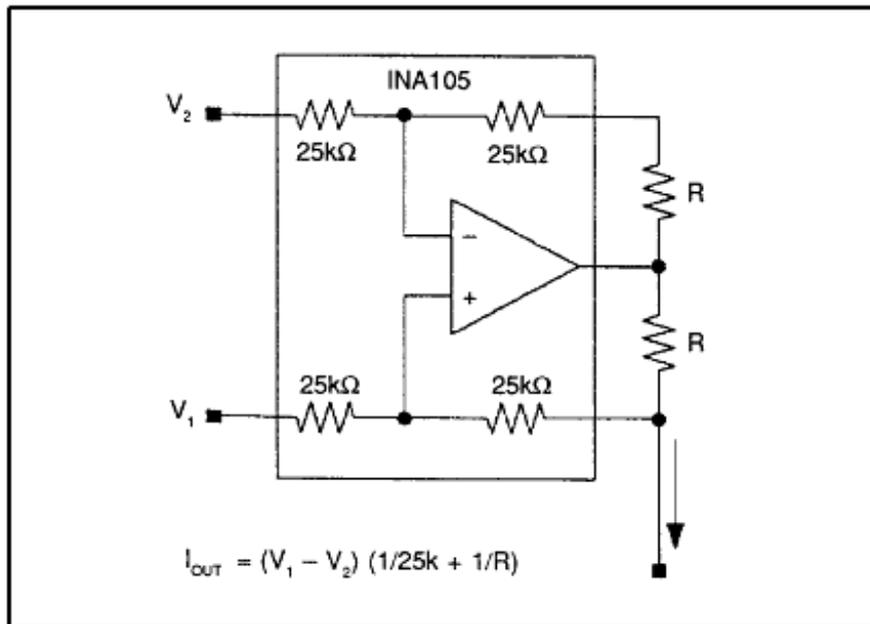


FIGURE 50. Voltage-controlled current source with differential inputs and bipolar output.

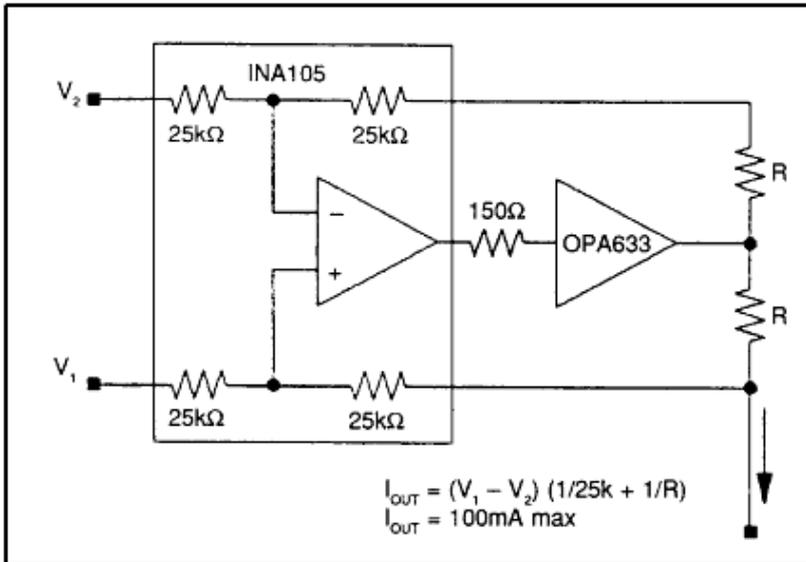


FIGURE 52. Voltage-controlled current source with differential inputs and current boosted bipolar output.

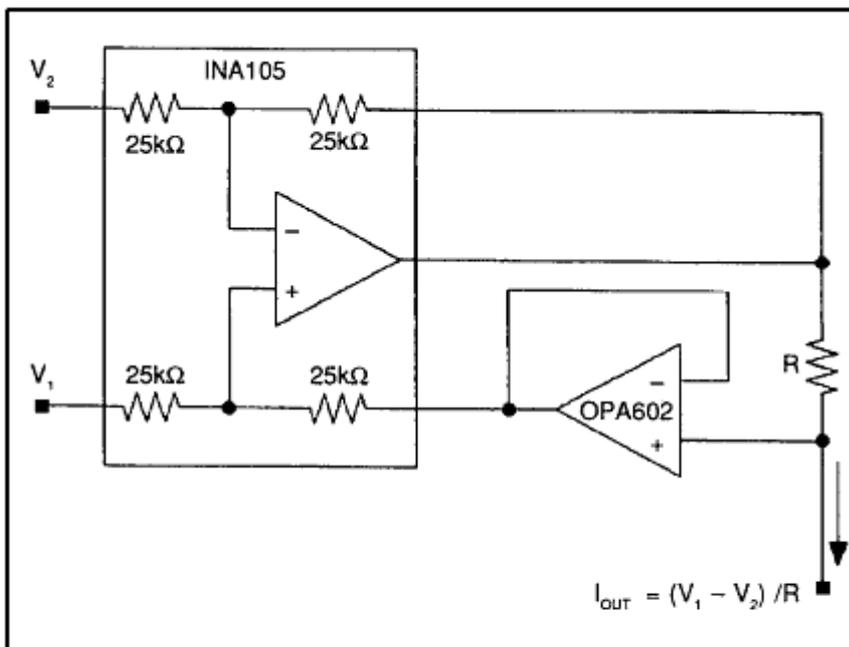


FIGURE 51. Voltage-controlled current source with differential inputs and bipolar output and circuit to eliminate feedback resistor error.

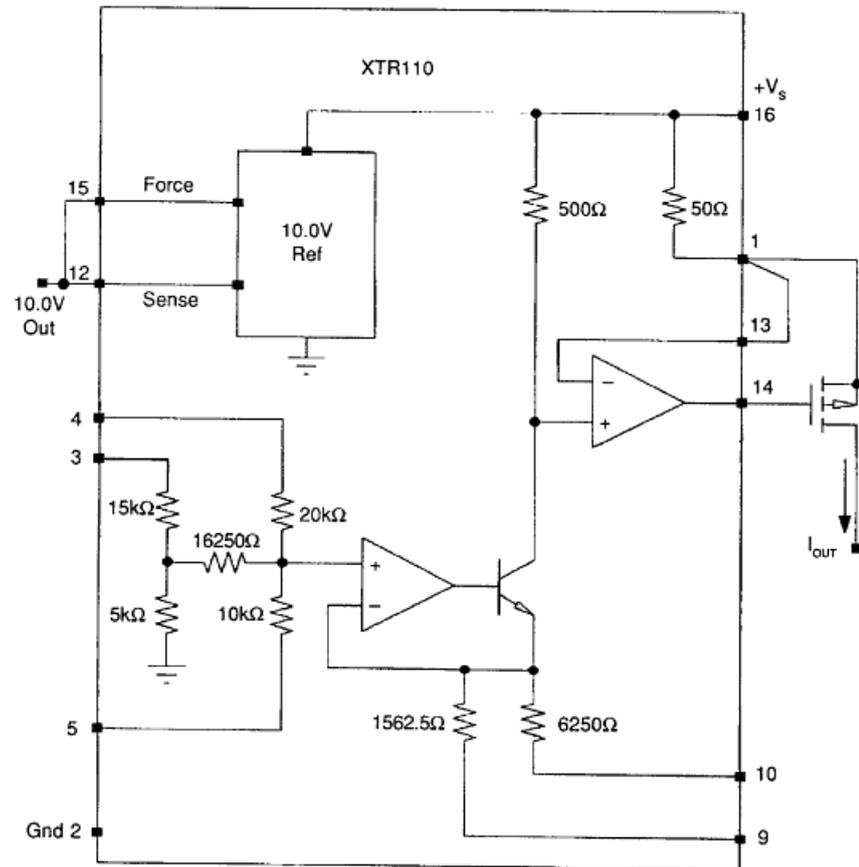


FIGURE 54. Precision single-supply voltage-to-current source transmitter—the XTR110.

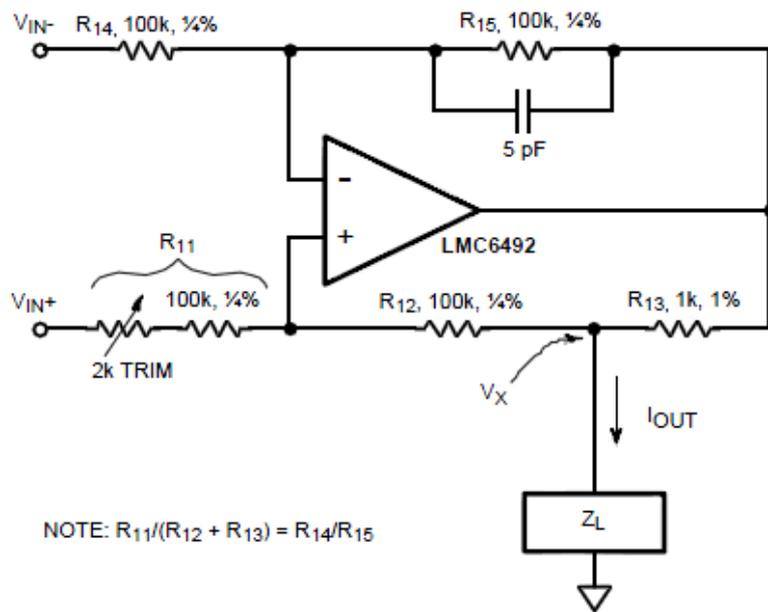


Figure 6. The “Improved Howland” with Trim for Z_{OUT}

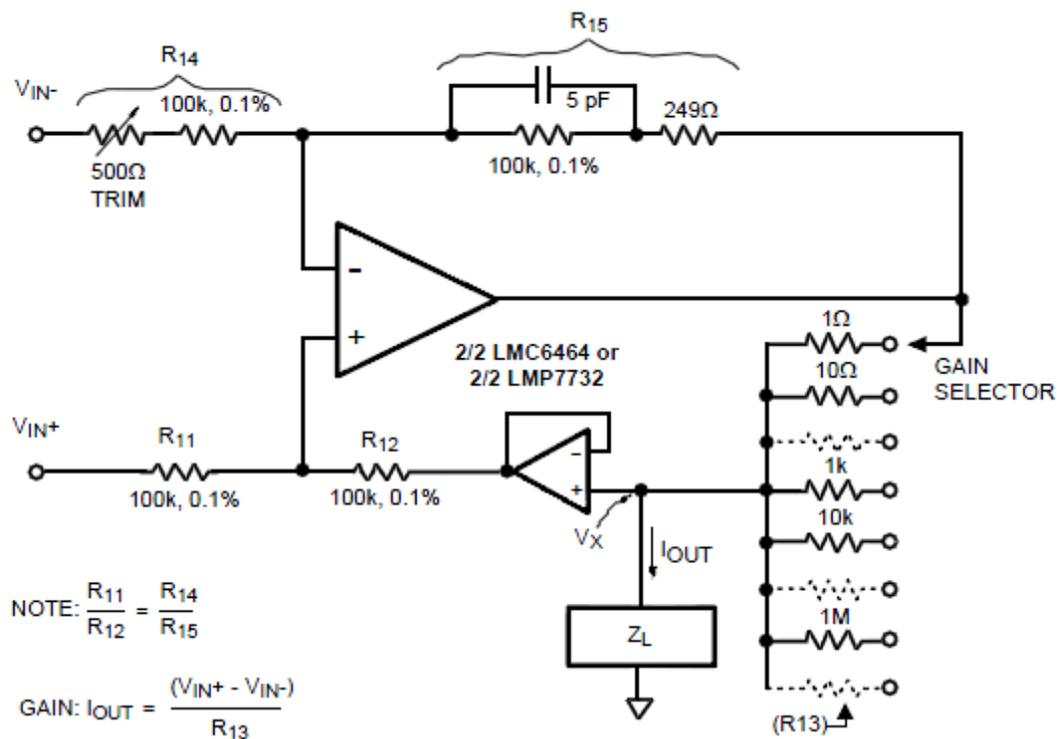


Figure 9. Multi-Range Current Pump

From EDN 'Two instrumentation amps make accurate voltage-to-current source' Frank Ciaglone

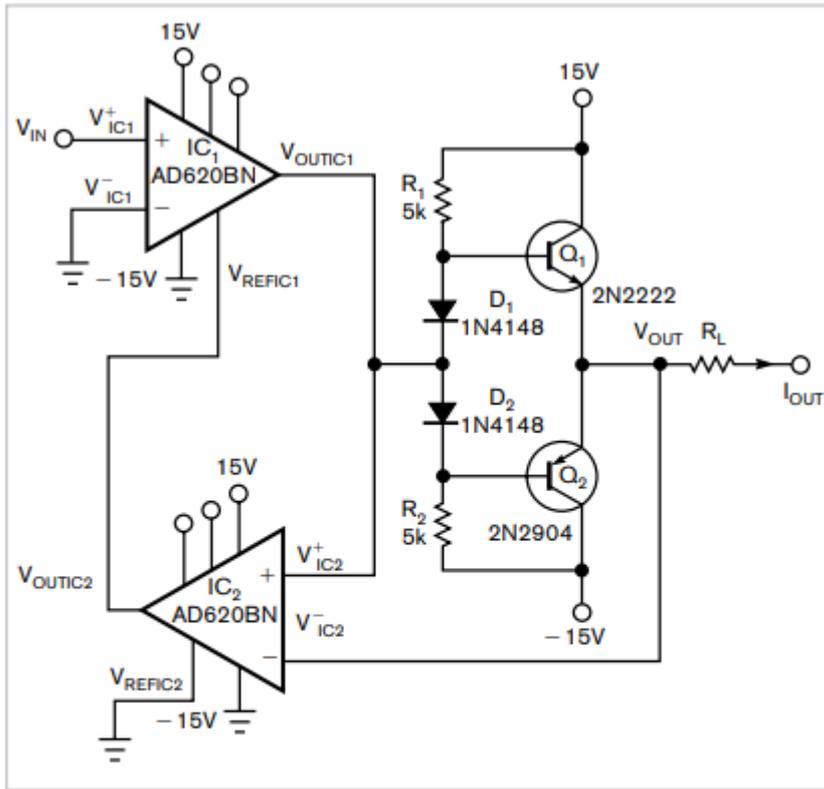
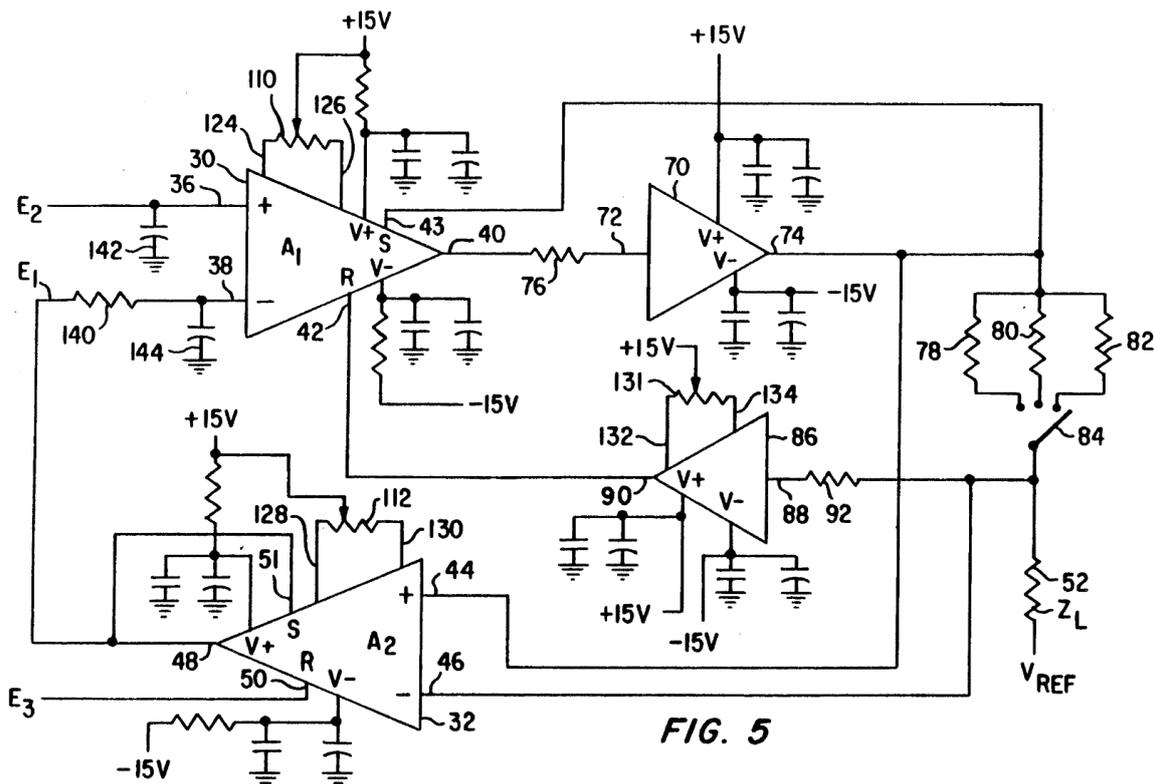


Figure 2 This handy voltage-to-current converter delivers high accuracy over a range of conditions.

From US5153499 patent



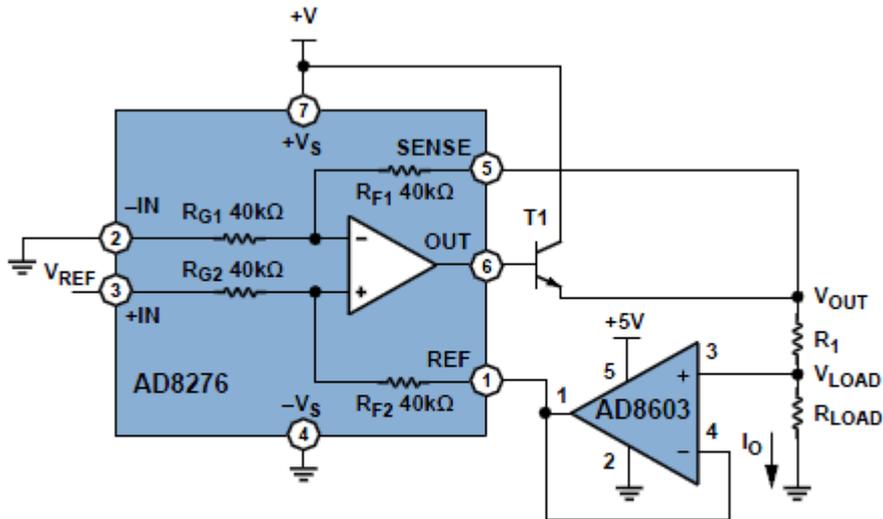


Figure 1. Difference amp and op amp form precision current source.

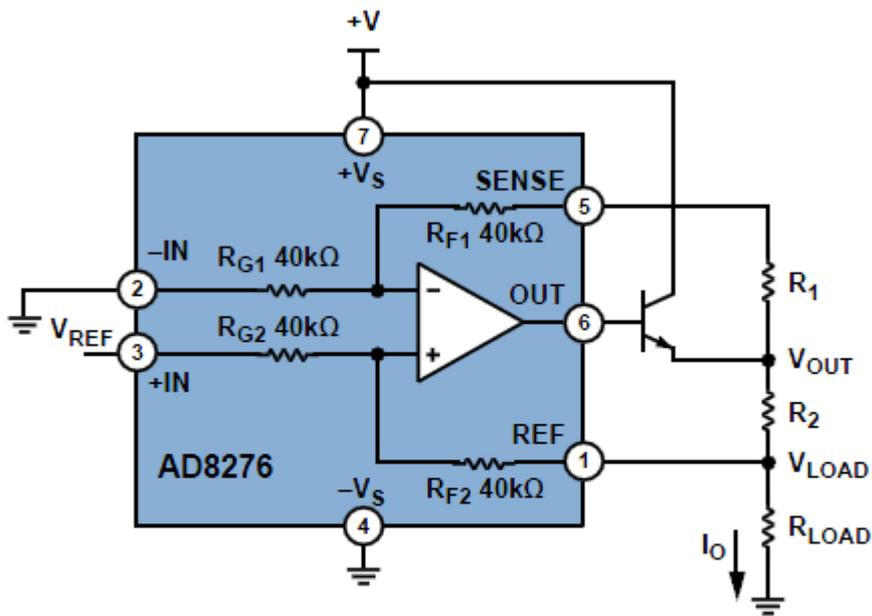


Figure 5. Difference amp and matched resistors form precision current source.

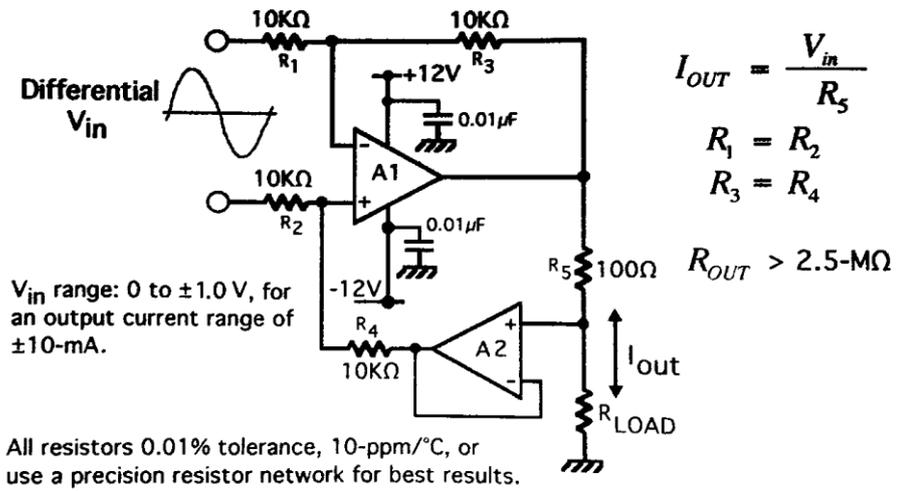


Figure 11.12. A fast, precision current pump.

From eevblog 'Precision voltage controlled current source?' source 'kridri'

