Buffered Current Source

Description

This current source is a voltage to current converter where $V_{BIAS}$ is the voltage that sets the voltage for the converter. This voltage is mirrored via the op amp to the inverting input and applied across the current setting resistor $R_{SET}$. The current output $I_{O}$ is directly determined by the equation: $I_{O} = V_{BIAS}/R_{SET}$. This current source can supply very low currents accurately. Optionally, $V_{BIAS}$ can also be set precisely by using an EPAD(R) MOSFET such as the ALD1108E. To increase current output, the current output MOSFET can be built by parallel connection of $n$ number of MOSFETs (all the drain terminals connected to each other, all the sources connected together and all gates shorted together). Alternatively, a power MOSFET can be employed to boost current output.

Recommended Components

Current output devices: $\frac{1}{2}$ ALD1102, $\frac{1}{4}$ ALD1106, $\frac{1}{2}$ ALD1116
Op Amps: ALD1721, ALD1701, ALD1706, ALD1726, ALD1702
Voltage setting MOSFET devices: $\frac{1}{2}$ ALD1102, $\frac{1}{4}$ ALD1106, $\frac{1}{2}$ ALD1116

Other Related Circuit Ideas

Schematic no. cs_11002.0 Cascode Current Source