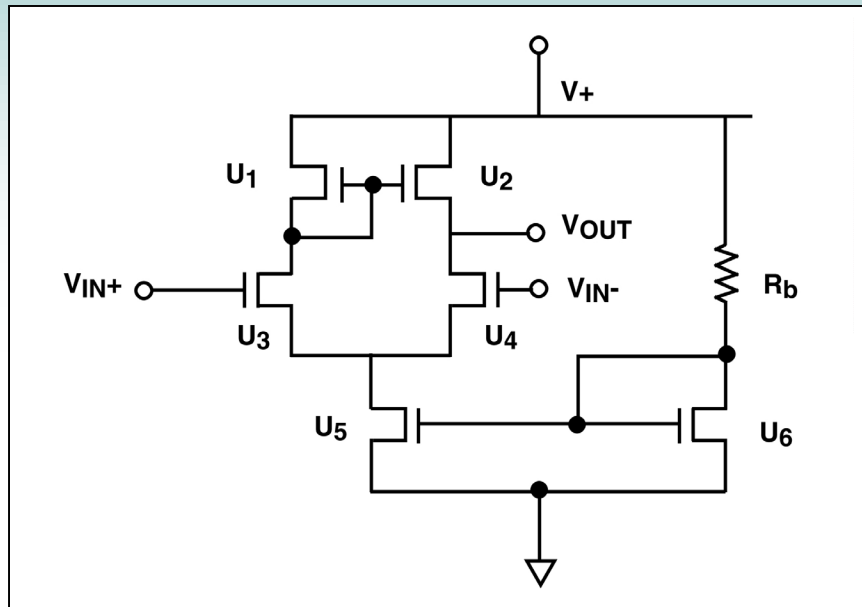




Ultra Low Voltage Differential Amplifier



Description

This circuit presents an ultra low voltage differential amplifier using discrete Zero Threshold or Nanopower EPAD MOSFETs. This differential amplifier has high input impedance and a DC voltage gain of approximately 23. The circuit can be implemented using various EPAD MOSFETs with different threshold voltages. The ratio of number of EPAD MOSFETs connected in parallel to construct U6 to U5 help determine the quiescent bias current of the differential pair and the bias output voltage. Generally an EPAD MOSFET ratio of 1X to 3X functions well, meaning using one EPAD MOSFET for U5 and up to three EPAD MOSFETs connected in parallel for U6. Similarly, U2 and U1 may need to be ratioed to bias the circuit to give a desired output voltage level. Depletion mode EPAD MOSFETs can also be employed for active loads U1 and U2.

An example shown here operates at supplies of +/- 0.2V, and consumes a total current of 46 nA, which results in 18nW of power.

Recommended Components

U1: ¼ ALD110800 U2: ¼ ALD110800 U3: ¼ ALD110800 U4: ¼ ALD110800
 U5: ¼ ALD110800 U6: ¼ ALD110800 Rb: 17.6MOhm

NOTE: ALD110900 is an equivalent dual device version of the ALD110800.

Other Related Circuit Ideas