



Category: Current Source

CIRCUIT IDEAS FOR DESIGNERS

Schematic no. cs_11009.0

Nanoamp EPAD Current Sink**Description**

This is a basic zero gate bias N-channel EPAD current source. The gate and the source of the MOSFET are connected. Hence, it does not require a separate gate bias voltage. The circuit has the ability to generate power in nano watts with the current flowing in nano amps and infinitesimally small gate to source voltage. The MOSFET essentially operates at or below its threshold voltage, $V_{GS(th)}$, which is its subthreshold region. At $V_{GS(th)}$ set to 0.0V, the drain-source current, $I_{DS} = I_{OUT}$ for the ALD110800 (or ALD110900, ALD212900, ALD210800, etc.), is $\sim 1000\text{nA}$ at $V_{DS}=0.1\text{V}$. At $V_{GS(th)}$ set to 0.0V, the drain-source current, $I_{DS} = I_{OUT}$ for the ALD110802 (or ALD110902, ALD212902, ALD210802), is $\sim 20\text{nA}$ at $V_{DS} = 0.1\text{V}$. At $V_{GS(th)}$ set to 0.0V, the drain-source current, $I_{DS} = I_{OUT}$ for the ALD110804 (or ALD110904, ALD212904, ALD210804), is $\sim 0.2\text{nA}$ at $V_{DS} = 0.1\text{V}$. As this threshold voltage decreases by a factor of 0.1V, the current flowing through the transistor decreases by a decade. This nA current source produces very high equivalent output resistance.

For full schematic diagram and notes, please register and login at aldinc.com