



Category: FET

CIRCUIT IDEAS FOR DESIGNERS

Schematic no. fet\_11137.0

## **P-Channel Current Mirrors & Current Multipliers**

## Description

When M1, M2, M3 and M4 are matched devices, the current across all the transistors have exactly the same gate bias voltage and remain constant. The drain and the gate of the M1 transistor are diode-connected and the current is set with VSET = ISET x RSET. The gate of M1 is connected to the gate of transistors M2, M3, and M4, which produces currents that mirror ISET. With equal resistance loads R1, R2 and R3, the voltages V1, V2 and V3 mirror VSET. This circuit has a range of current values from 100µA to 0.1µA. A 100µA current is achieved using RSET = 1.5K $\Omega$  and a 0.1µA current is achieved using RSET = 2M $\Omega$ . For current multiplier applications, connecting V1 and V2 together produces 2 X ISET current, and connecting V1, V2 and V3 together produces 3 x ISET current. Alternatively, V1, V2 and V3 are three separate independent current sources, each at ISET.

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

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