



Category: Current Source

CIRCUIT IDEAS FOR DESIGNERS

Schematic no. cs_11011.0

Low Tempco 44 μ A P-channel Cascode Current Source**Description**

This P-channel cascode micro current source is used when higher temperature stability is desired. Q1 is diode-connected with its source connected to V+ and Q4 is diode-connected with its source connected to the drain of Q1. V_{GS} of Q1 sets V_{GS} of Q2 whereas V_{GS} of Q4 sets V_{GS} of Q3. I_{DS} current through Q1 is equal to that of Q4, which in turn is set by R₁ and R_P. R_P is adjusted so that I_{OUT} is equal to 44 μ A. I_{DS} of Q2 is equal to I_{DS} of Q3, which is equal to I_{DS} of Q1 as Q1 and Q2 are matched and have equal V_{GS}. The set current measured across the two resistors R₁+ R_P is therefore equal to I_{OUT}. This circuit operates at near zero tempco which means that the circuit can undergo a wide range of temperature values without affecting I_{OUT} =44 μ A. The operating temperature range of this circuit is between -25°C and +125°C, giving an average temperature coefficient of 121ppm (parts per million). This 44 μ A output current is valid for output voltage range from -5V to 3V with an average error of less than one percent.

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