

Voltage Reference for Battery Powered Circuits

The LM4050 from National Semiconductor is a high precision micropower shunt voltage reference in a sub-miniature, surface-mount, three pin, SOT-23 package. The unit operates in the industrial temperature range of -40°C to $+85^{\circ}\text{C}$. The design eliminates the need for an external stabilising capacitor and is at the same time stable when operated into any capacitive load. The unit is available in several different, fixed reverse breakdown voltages from 2.500 V, 4.096 V, 5.000 V, 8.192 V to 10.000 V. The minimum operating current ranges from $60\ \mu\text{A}$ for the LM4050-2.5 to $100\ \mu\text{A}$ for the LM4050-10.0 this, along with its tiny outline, makes it ideal for use in battery powered applications. The LM4050 is available in three different grades of accuracy of **0.1%**, **0.2%** and **0.5%**, all have a low temperature coefficient of less than $50\ \text{ppm}/^{\circ}\text{C}$.

During the manufacturing process, the use of fuse and zener-zap reverse breakdown voltage trimming ensure that the premium (or A grade) components have an accuracy of better than $\pm 0.1\%$ at 25°C . Stable reverse breakdown accuracy over a wide range of temperatures and operating currents is achieved by bandgap reference temperature drift curvature correction and a low dynamic impedance. Altogether this is a versatile component with an impressive specification.

The full data sheet is available from the web site: www.national.com

