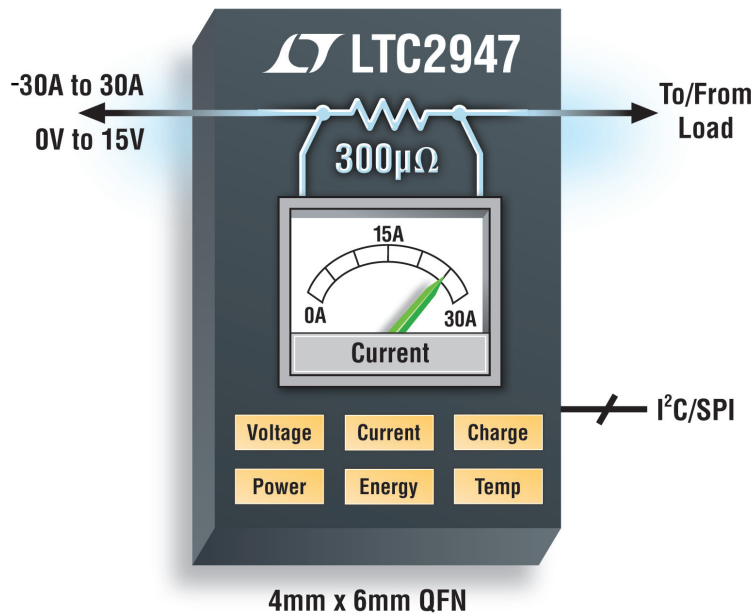


Energy Meter with Integrated Sense Resistor



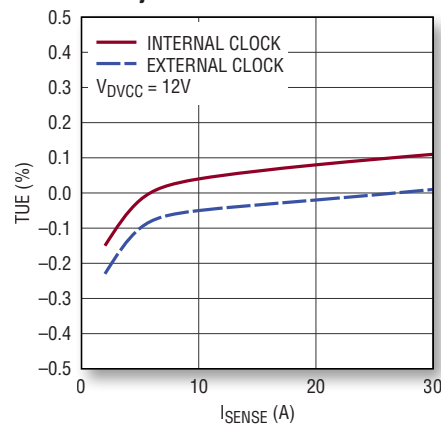
Internal 30A/300 $\mu\Omega$ Sense Resistor with 1.0% Current Accuracy

Now it's easy to digitally monitor the parameters required to accurately manage your system's power profile or energy consumption. Current, voltage, power, charge and energy data are available via a simple I²C/SPI interface. The LTC[®]2947 utilizes three $\Delta\Sigma$ ADCs to simultaneously measure current and voltage, and calculate power for true power readings. An integrated temperature-compensated sense resistor maximizes measurement accuracy over temperature and simplifies space-constrained designs.

Features

- Monitors Current (1.0%), Voltage (0.5%), Power (1.2%), Charge (1.0%) and Energy (1.2%)
- Integrated 300 $\mu\Omega$ Sense Resistor with \pm 30A Current Range and Low 9mA Offset
- 0V to 15V Rail-to-Rail Input Range
- Three $\Delta\Sigma$ ADCs for Instantaneous Multiplication of Voltage and Current
- Internal \pm 1% or External Time Bases
- Max and Min Value Tracking
- Alerts when Limits Exceeded
- I²C or SPI Configurable Interface
- 32-Pin 4mm x 6mm QFN Package

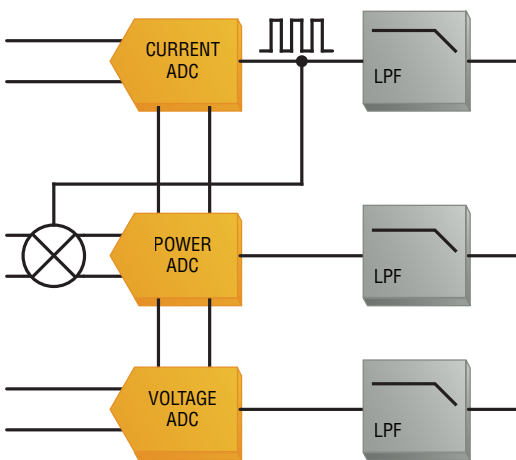
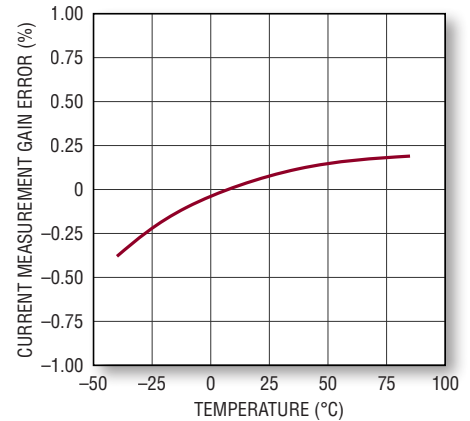
Energy Measurement Total Unadjusted Error vs Current



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Integrated Sense Resistor

At high current levels, power dissipation typically mandates the use of a low value sense resistor which also reduces input voltage signal. As a result, current measurement accuracy becomes susceptible to thermoelectric voltages and board layout. The LTC2947's integrated temperature-compensated $300\mu\Omega$ sense resistor is insensitive to such disturbances and provides low power dissipation and high accuracy across the entire operating range, producing a $\pm 30A$ monitoring solution that is superior to external sense resistor solutions.



Three ADCs

The LTC2947 employs three $\Delta\Sigma$ ADCs to measure voltage, current and power. Instead of multiplying average values of current and voltage, the LTC2947 multiplies raw (pre-decimation filter) readings of current and voltage at a 5MHz sampling frequency, then converts the results. This technique enables the LTC2947 to accurately measure power in the presence of current and voltage variations up to 50kHz—far beyond its conversion frequency. This may happen when power is drawn from a battery with significant impedance, resulting in up to 10% more accurate power measurement results.

Demonstration System

Quickly evaluate the LTC2947's functions and performance with the simple DC2334 demonstration circuit and intuitive QuikEval™ PC software, or attach an available LCD keypad shield to run as a standalone power, charge and energy monitor without the need of a PC. Further minimize development time with complete driver code (written in C), schematics, bill of materials (BOM) and Gerber files.

