



Guaranteed 0.04% Accurate Hybrid/Electric Battery Monitor Includes Isolated Interface

MILPITAS, CA – October 31, 2012 – Linear Technology announces the [LTC®6804](#) high voltage battery monitor for hybrid electric and electric vehicles, and other high voltage, stacked-battery systems. An LTC6804 can measure up to 12 series connected battery cells at voltages up to 4.2V with 16 bit resolution and better than 0.04% accuracy. This high precision is maintained over time, temperature and operating conditions by a sub-surface Zener voltage reference similar to references used in precision instrumentation. When stacked in series, the LTC6804 enables the measurement of every battery cell voltage in large high voltage systems. Six operating modes are available to optimize update rate, resolution and the low pass response of the built-in 3rd order noise filter. In the fastest mode, all cells can be measured within 290µsec.

Multiple LTC6804s can be interconnected over long distances and operated simultaneously, using Linear Technology's proprietary 2-wire isoSPI™ interface. Integrated into every LTC6804, the isoSPI interface provides high RF noise immunity up to 1Mbps and up to 100 meters of cable, using only twisted pair. Two communication options are available: with the LTC6804-1, multiple devices are connected in a daisy chain with one host processor connection for all devices; with the LTC6804-2, multiple devices are connected in parallel to the host processor with each device individually addressed.

The LTC6804 was designed to minimize power consumption, especially during long-term storage where battery drain is unacceptable. In sleep mode, the LTC6804 draws less than 4µA from the batteries. General purpose I/O pins are available to monitor analog signals, such as current and temperature, and can be captured simultaneously with the cell voltage measurements. Additional features include passive balancing for each cell with a programmable balancing timer for up to 2 hours, even when the LTC6804 is in sleep mode. The LTC6804 interfaces with external I²C devices such as temperature sensors, ADCs, DACs and EEPROM. Local EEPROM can be used to store serialization and calibration data, enabling modular systems.

The LTC6804 was designed to surpass the environmental, reliability and safety demands of automotive and industrial applications. The LTC6804 is fully specified for operation from -40°C to 125°C. It has been engineered for ISO 26262 (ASIL) compliant systems and a full set of self-tests ensure that there are no latent fault conditions. To accomplish this, the LTC6804 includes a redundant voltage reference, extensive logic test circuitry, open wire detection capability, a watchdog timer and packet error checking on the serial interface.

“The LTC6804 combines 30 years of analog experience with hard-earned lessons in automotive battery management,” says Mike Kultgen, design manager for Linear Technology. “On the bench, or on the road, this part delivers outstanding performance.”

Along with the LTC6804, Linear Technology is introducing the LTC6820 isoSPI transceiver. The LTC6820 enables bidirectional transmission of the Serial Peripheral Interface bus (SPI) across an isolated barrier up to 100 meters. With the LTC6820, the SPI data is encoded into a differential signal, which is then transmitted via twisted pair and a simple, inexpensive Ethernet transformer. The LTC6820 supports SPI data rates up to 1MHz, using matched source and sink currents to eliminate the need for a transformer center tap and to reduce EMI. The drive currents and the comparator thresholds are set with two resistors, allowing the system to be optimized for cable length and signal-to-noise performance. The [LTC6820](#) is a companion to the LTC6804 high voltage battery monitor with its built-in isoSPI interface. Battery management systems using the LTC6804 can interface to external components, such as microcontrollers, via the LTC6820.

The LTC6804 is offered in a small 8mm x 12mm surface mount device. Priced at \$10.95 each in 1,000-piece quantities, samples, demonstration boards and the data sheet are now available at www.linear.com/product/LTC6804. The LTC6804 will be available in production quantities in January 2013. The LTC6820 is offered in an MSOP and tiny QFN package and is priced at \$2.29 each in 1,000-piece quantities. Samples, demonstration boards and the data sheet are now available for the www.linear.com/product/LTC6820.

Photo Caption: Precision, High Voltage Multicell Battery Stack Monitor & High Noise Immunity, Isolated, Bidirectional SPI Communications up to 100M

Summary of Features: LTC6804 & LTC6820

LTC6804

- Measures up to 12 Battery Cells in Series
- Stackable Architecture Supports 100s of Cells
- Built-in isoSPI Interface
 - 1MB Isolated Serial Communications
 - Uses a Single Twisted Pair, up to 100 Meters
 - Low EMI Susceptibility & Emissions
- 1.2mV Maximum Total Measurement Error
- 290µs to Measure All Cells in a System
- Synchronized Voltage & Current Measurement
- Delta-Sigma Converter with Built-In Noise Filter
- Engineered for ISO26262-Compliant Systems
- Passive Cell Balancing with Programmable Timer
- 5 General Purpose Digital I/O or Analog Inputs
 - Temperature or other Sensor Inputs
 - Configurable for I²C Interface
- 4µA Sleep Mode Supply Current
- 48-Lead SSOP Package

LTC6820

- 1Mbps Isolated SPI Data Communications
- Simple Galvanic Isolation Using Standard Transformers
- Bidirectional Interface over a Single Twisted Pair
- Supports Cable Lengths up to 100 Meters
- Very Low EMI Susceptibility & Emissions
- Configurable for High Noise Immunity or Low Power
- Requires No Software Changes in Most Systems
- Ultralow, 2µA Idle Current
- Automatic Wake-Up Detection
- Operating Temperature Range: -40°C to 125°C
- 2.7V to 5.5V Power Supply
- Interfaces to All Logic from 1.7V to 5.5V
- Available in 16-Lead QFN & MSOP Packages

About Linear Technology

Linear Technology Corporation, a member of the S&P 500, has been designing, manufacturing and marketing a broad line of high performance analog integrated circuits for major companies worldwide for three decades. The Company's products provide an essential bridge between our analog world and the digital electronics in communications, networking, industrial, automotive, computer, medical, instrumentation, consumer, and military and aerospace systems. Linear Technology produces power management, data conversion, signal conditioning, RF and interface ICs, µModule[®] subsystems, and wireless sensor network products. For more information, visit www.linear.com

 , LT, LTC, LTM, Linear Technology, the Linear logo and μ Module and are registered trademarks and isoSPI is a trademark of Linear Technology Corp. All other trademarks are the property of their respective owners.

Press Contacts:

North America / Worldwide

John Hamburger, Director Marketing
Communications
jhamburger@linear.com
Tel: 408-432-1900 ext 2419

Doug Dickinson, Media Relations Manager
ddickinson@linear.com
Tel: 408-432-1900 ext 2233

UK & Nordic

Alan Timmins
alan@ezwire.com
Tel: +44-1-252-629937