



4 μ A I_Q Hot Swap Controller Protects Batteries from Voltage & Current Faults

MILPITAS, CA – August 25, 2014 – Linear Technology Corporation introduces the [LTC4231](#), an ultralow quiescent current (I_Q) Hot Swap™ controller, enabling safe board or battery insertion and extraction from 2.7V to 36V systems. The LTC4231 controls an external N-channel MOSFET to gently power up board capacitors, avoiding sparks, connector damage and system glitches. Device quiescent current is a mere 4 μ A during normal operation, dropping to 0.3 μ A in shutdown mode. To ensure low current operation, the undervoltage and overvoltage resistive dividers are connected to a strobed ground, lowering their average current draw by 50x. The LTC4231 provides a compact and rugged micropower solution for hot plugging and battery protection, especially in energy conscious applications utilizing solar power or energy harvesting.

The LTC4231 survives and also protects downstream circuitry from reversed batteries up to –40V by controlling back-to-back N-channel MOSFETs. Undervoltage protection cuts off low voltage batteries to prevent deep discharge, while adjustable hysteresis avoids oscillations from battery recovery after load removal. Dual level overcurrent protection is provided by a timed circuit breaker and fast current limit. The 2.7V to 36V operating range accommodates a wide range of battery chemistries including lead-acid, Li-Ion and stacked NiCd.

The LTC4231 is available in two options: the LTC4231-1 remains off after an overcurrent fault, whereas the LTC4231-2 automatically attempts to turn on after a 500ms cooldown period. Specified over the 0°C to 70°C commercial and –40°C to 85°C industrial temperature ranges, the LTC4231 is offered in 12-pin MSOP and 3mm x 3mm QFN packages. 1,000-piece pricing starts at \$2.25 each. Device samples and evaluation circuit boards are available online or from your local Linear Technology sales office. For more information, visit www.linear.com/product/LTC4231

Photo Caption: 4 μ A I_Q, 2.7V to 36V V_{IN} Hot Swap™ Controller for On/Off, Low Battery Cutoff, Reverse Battery & Overload/Short-Circuit Protection


Summary of Features: LTC4231

- Enables Safe Board or Battery Insertion & Removal
- Low Quiescent Current: 4 μ A in Normal Operation, 0.3 μ A in Shutdown
- Overcurrent Protection
 - o Dual Level: Circuit Breaker with Higher Current Limit
 - o Adjustable Circuit Breaker Response Time
 - o 1 μ s (max) Fast Current Limit Response
 - o Automatic Retry or Latchoff After Current Fault
- Overvoltage & Undervoltage Protection
 - o Adjustable Undervoltage Hysteresis
 - o Divider Switched Ground to Reduce Current
- Wide Operating Voltage Range : 2.7V to 36V
- Reverse Battery Protection to –40V
- MOSFET On Status Output
- 12-Pin MSOP & 3mm × 3mm QFN Packages

The USA list pricing shown is for budgetary use only. International prices may differ due to local duties, taxes, fees and exchange rates.

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 over 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, μ Module® subsystems, and wireless sensor network products. For more information, visit www.linear.com

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