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Overvoltage Protection Regulator & Inrush Current Limiter Provides Protection Barrier for Intrinsic Safety Applications

MILPITAS, CA – May 5, 2009 – Linear Technology Corporation introduces the LT4356-3, an overvoltage protection regulator with overcurrent protection and inrush current limiting for high availability systems. The LT4356-3 is a new option offering latchoff operation under fault conditions, and is the latest member of a family of products designed to suppress high voltage surges and currents to protect downstream electronics from damage. The LT4356-3 provides an energy-efficient barrier to limit the amount of electrical and thermal energy available to electrical equipment, an important requirement in Intrinsic Safety applications.

Intrinsically safe equipment must operate in hazardous environments, where the amount of power dissipated must be limited under normal or abnormal operating conditions to prevent explosions caused by the ignition of hazardous gases. Traditional protection techniques use bulky, passive devices like Zener safety barriers, which consist of Zener diodes, resistors and fuses. These devices must be rated at 1.7 times the power they dissipate, so a resistor required to protect an IC under failure can be as large as the size of a thumb. The LT4356-3 provides an active barrier that, under normal operation, passes input power directly to the load with very little loss.

During an overvoltage event, the LT4356-3 regulates the output to a user-defined voltage by controlling the gate of an external N-Channel MOSFET. Inrush current limiting is achieved by controlling the voltage slew rate of the gate. The LT4356-3 monitors voltage drop across a current sense resistor at the input of the circuit to protect against overcurrent faults. For either an

overvoltage or overcurrent fault condition, an integrated fault timer ensures safe shutdown of the MOSFET if the fault persists. For complete conformance to the Intrinsic Safety specification, the LT4356-3 is offered in a 16-pin SOIC package, addressing the high voltage pin spacing requirements. Using two devices in series meets the redundancy requirements of the specification.

The LT4356-3 offers a wide input operating range of 4V to 80V, and can handle transient voltages of 100V and higher, in addition to providing reverse input protection to -60V without damage to itself or the load. The LT4356-3 is ideal for automotive, industrial, avionics and intrinsic safety applications, as well as positive high voltage distributed power Hot Swap™ systems.

An auxiliary amplifier is provided for additional design flexibility. The LT4356-3 can be used as a voltage detection comparator or as a low dropout (LDO) linear regulator controller. The LT4356 is available in three options, defined by the function of the shutdown pin. For the LT4356-1 (auto-retry) and LT4356-3 (latchoff option), shutdown of the device reduces the quiescent current to 7uA. For the LT4356-2 with auto-retry, the auxiliary amplifier and internal reference remain active to ensure a keep-alive supply voltage for vital functions when the main system is shut down. Quiescent current is reduced to 60uA during shutdown.

Specified over the full commercial, industrial, automotive and military temperature ranges, all three versions of the LT4356 are offered in (4mm x 3mm) 12-pin DFN, 10-pin MSOP and 16-pin SOIC packages. Demo boards and samples may be ordered from www.linear.com. Pricing begins at \$1.98 each for 1,000-piece quantities and the device is available today in production quantities. For more information, visit www.linear.com.


Photo Caption: LT4356 Intrinsic Safety Barrier

Summary of Features: LT4356

- Wide Operating Range: 4V to 80V
- Adjustable Output Clamp Voltage
- Inrush Current Limiting
- Reverse Input Protection to -60V
- Adjustable Fault Timer
- Fault Output Indication
- Spare Amplifier for Level Detection Comparator or Linear Regulator Controller
- Overcurrent Protection
- -55°C to +125°C Operation (Military Plastic)
- 12-Pin 4mm x 3mm DFN, 10-Lead MSOP & 16-Lead SOIC Packages

About Linear Technology

Linear Technology Corporation, a manufacturer of high performance linear integrated circuits, was founded in 1981, became a public company in 1986 and joined the S&P 500 index of major public companies in 2000. Linear Technology products include high performance amplifiers, comparators, voltage references, monolithic filters, linear regulators, DC-DC converters, battery chargers, data converters, communications interface circuits, RF signal conditioning circuits, and many other analog functions. Applications for Linear Technology's high performance circuits include telecommunications, cellular telephones, networking products such as optical switches, notebook and desktop computers, computer peripherals, video/multimedia, industrial instrumentation, security monitoring devices, high-end consumer products such as digital cameras and MP3 players, complex medical devices, automotive electronics, factory automation, process control, and military and space systems.

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