



36V, 800mA Robust Linear Regulator Has Extended SOA Plus Current & Temperature Monitor Outputs

MILPITAS, CA – February 4, 2016 – Linear Technology Corporation announces the [LT3089](#), a rugged 800mA wide input voltage range linear regulator with key usability, monitoring and protection features. The device has an extended safe operating area (SOA) compared to existing regulators, making it ideal for high input-to-output voltage and high output current applications where older regulators limit the output. The LT3089 uses a current source reference for single resistor output voltage settings and output adjustability down to 0V. Output current limit can be set externally with a single resistor. This regulator architecture, combined with low millivolt line and load regulation, enables multiple ICs to be paralleled easily for heat spreading and higher output current. The current from the device's current monitor can be summed with the set current for line-drop compensation, where the output of the LT3089 increases its current to compensate for line drops.

The LT3089 achieves unmatched line and load regulation of under 2mV, independent of output voltage, and features an input voltage range from 1.2V to 36V. The device fits well in applications requiring multiple rails. Output voltage is programmable with a single resistor from 0V to 34.5V with a 1.2V dropout. The on-chip trimmed 50 μ A current reference is $\pm 1\%$ accurate. The regulation, transient response and output noise (27 μ V_{RMS}) are independent of output voltage due to the device's voltage follower architecture. The LT3089 is configurable as a 2-terminal current source using only two resistors. Input or output capacitors for stability are optional in either linear regulator mode or current-source mode of operation.

The LT3089 provides several monitoring and protection functions. Current limit can be programmed with a single resistor. Monitor outputs provide a current output proportional to temperature (1 μ A/ $^{\circ}$ C) and output current (200 μ A/A), allowing easy ground-based measurement. The current monitor can be used to compensate for cable drops. The LT3089's internal protection

circuitry includes reverse input protection, reverse-current protection, internal current limiting and thermal shutdown.

According to Robert Dobkin, Linear Technology's Vice President, Engineering and CTO, "The LT3089 regulator's robust architecture, protection and monitoring features provide designers with new tools for reliable designs. A DD-Pak package for high power dissipation and various surface mount packages for lower power applications are available. System power and temperature are easily checked for proper operation."

The LT3089 is offered in a variety of thermally enhanced surface-mount compatible packages, including a low profile (0.75mm) 12-lead 4mm x 4mm DFN, a 16-lead thermally enhanced TSSOP and a 7-lead DD-Pak; all dissipate 2W in surface mount applications with no heat sink. A wide variety of grades/temperature ranges are offered including: E and I grades -40°C to 125°C , H grade -40°C to 150°C and the high reliability MP grade -55°C to 150°C . 1,000-piece pricing starts at \$2.13 each for the E grade. For more information, visit www.linear.com/product/LT3089.

Photo Caption: Rugged, 36V Wide SOA 800mA Linear Regulator


Summary of Features: LT3089

- Rugged Industrial Linear Regulator
- Wide Safe Operating Area at 800mA Output
- Output Current Monitor: $I_{\text{MON}} = I_{\text{OUT}}/5000$
- Junction Temperature Monitor: $1\mu\text{A}/^{\circ}\text{C}$
- Wide Input Voltage Range: 1.2V to 36V
- Single Resistor Sets Output Voltage 0 to 34.5V
- 50 μA SET Pin Current: 1% Initial Accuracy
- Paralleled Easily for Higher Current or Heat Spreading
- Externally Settable Current Limit
- Input or Output Capacitors optional
- $<1\text{mV}$ Load Regulation Typical
- $<0.001\%/V$ Line Regulation Typical
- Current Limit, Thermal Shutdown & Reverse Input Protection
- Available in Thermally Enhanced 12-Lead 4mm x 4mm DFN & 16-Lead TSSOP, 7-Lead DD-Pak 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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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