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Synchronous Step-Down DC/DC Controller Delivers Up to 95% Efficiency with 2MHz Operating Frequency

MILPITAS, CA – January 17, 2012 – Linear Technology Corporation introduces the [LTC3839](#), a high frequency controlled on-time single output dual phase synchronous step-down DC/DC controller that can achieve up to 92% efficiency with a 25A output when operating at 2MHz. The operating frequency is selectable from 200kHz to 2MHz or can be synchronized to an external clock. A low 30ns minimum on-time allows for a high step-down ratio at very high operating frequencies. The controlled on-time, valley current-mode architecture and Detect Transient Release feature provide a very fast transient response by increasing operating frequency during a transient event, enabling the output voltage to recover in only a few clock cycles. Up to 12 phases can be paralleled and clocked out of phase for high current applications (up to 250A).

The LTC3839 operates over a 4.5V to 38V input voltage range, encompassing a wide variety of applications including most intermediate bus voltages. Strong onboard N-channel MOSFET gate drivers allow the use of high power external MOSFETs for output currents up to 50A, at output voltages ranging from 0.6V to 5.5V, making the device ideal for point-of-load requirements. The LTC3839's differential amplifier provides true remote output voltage sensing of both the positive and negative terminals, enabling high accuracy regulation independent of PCB IR losses (up to $\pm 500\text{mV}$). The output current is monitored by sensing the voltage drop across the output inductor (DCR) for highest efficiency or by using a sense resistor for extra precision. Additional features include an onboard bias voltage LDO, soft-start or tracking, adjustable current limit, overvoltage protection, current limit foldback and external V_{CC} control.

The LTC3839 offers superior total regulation accuracy and is specified to account for all error sources including line, load and differential sensing. The LTC3839 total output voltage accuracy is $\pm 0.25\%$ at 25°C , $\pm 0.67\%$ from 0°C to 85°C , and $\pm 1\%$ maximum DC error over the full -40°C to 125°C operating junction temperature range. The LTC3839 is available in a thermally enhanced 5mm x 5mm QFN-32 package. The 1,000-piece price starts at \$3.18 each.

For more information, visit www.linear.com/product/LTC3839


Photo Caption: High Frequency/High Efficiency Step-Down DC/DC Controller

Summary of Features: LTC3839

- Controlled On-Time, Valley Current-Mode Control for Very Fast Transient Response
- Programmable Operating Frequency from 200kHz to 2MHz, Synchronizable to an External Clock
- Wide V_{IN} Range: 4.5V to 38V
- V_{OUT} Range: 0.6V to 5.5V
- Up to 50A Output Current
- High Step-Down Ratio: 30ns Minimum On-Time
- Up to 12 Phase Operation
- Detect Transient Release Feature
- Differential Amplifier for Remote Output Voltage Sensing
- $\pm 0.67\%$ Output Voltage Accuracy over Temperature
- R_{SENSE} or DCR Current Sensing
- Output Voltage Tracking or Programmable Soft Start
- Adjustable Current Limit
- Overvoltage Protection
- Foldback Current Limit

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, and μ Module[®] subsystems.

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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