



2MHz, DC Accurate Synchronous Step-Down DC/DC Controller with Differential Output Sensing & Clock Synchronization

MILPITAS, CA – November 2, 2010 – Linear Technology Corporation introduces the [LTC3833](#), a high frequency controlled on-time synchronous step-down DC/DC controller with differential output voltage sensing and clock synchronization. The controlled on-time, valley current-mode architecture forces a very fast transient response by increasing its operating frequency during a transient event, allowing the LTC3833 to recover from a large load step in only a few cycles. Its 4.5V to 38V input range encompasses 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 high load current, up to 25A in applications with output voltages ranging from 0.6V to 5.5V, making it ideal for point-of-load requirements.

The LTC3833's differential amplifier provides true remote output voltage sensing of both the positive and negative terminals, enabling high accuracy regulation independent of IR losses (up to $\pm 500\text{mV}$) in trace runs, vias and interconnects. A low 20ns minimum on time allows for a high step-down ratio power supply at high frequency operation. The operating frequency is selectable from 200kHz to 2MHz or can be synchronized to an external clock. The output current is monitored by sensing the voltage drop across the output inductor (DCR) for highest efficiency or by using a sense resistor. 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 LTC3833 offers superior total differential regulation accuracy and is specified to account for all error sources including line, load and differential sensing. The LTC3833 total differential output voltage accuracy is $\pm 0.25\%$ at 25°C, $\pm 0.67\%$ from 0°C to 85°C and $\pm 1\%$ over the full -40°C to 125°C operating junction temperature range. The LTC3833 is available in thermally enhanced 3mm x 4mm QFN-20 or TSSOP-20E packages. The 1,000-piece price starts at \$2.65 each. For more information, visit www.linear.com/3833.


Photo Caption: Fast Synchronous Step-Down DC/DC Controller

Summary of Features: LTC3833

- Controlled On Time for Very Fast Transient Response
- Differential Amplifier for Remote Output Voltage Sensing
- Wide V_{IN} Range: 4.5V to 38V
- V_{OUT} Range: 0.6V to 5.5V
- High Step-Down Ratio: 20ns Minimum On Time
- Selectable Fixed Operating Frequency from 200kHz to 2MHz
- $\pm 0.67\%$ 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
- Valley Current-Mode Control

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, μ Module[®] products, 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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