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Low Input Voltage Synchronous Step-Down DC/DC Controller Drives 5V Logic Level MOSFETs for High Efficiency

MILPITAS, CA – November 1, 2010 – Linear Technology Corporation announces the LTC3852, a low/wide input voltage (2.7V to 5.5V or 4V-38V) synchronous step-down DC/DC controller. The device's onboard charge pump provides 5V bias to drive low $R_{DS(ON)}$ and standard logic-level power MOSFETs from a 3.3V nominal supply. Since the LTC3852's internal charge pump and DC/DC controller are independent, the charge pump output can provide 5V to power the internal gate drivers, and the DC/DC converter power stage can draw power from another source (up to 38V maximum). Output currents up to 25A can be supplied over an output voltage range from 0.8V to 99% of V_{IN} (2.7V-5.5V), making the LTC3852 ideal for 3.3V-powered point-of-load applications.

A constant-frequency current-mode architecture allows a selectable fixed or phase-lockable (PLL) frequency from 250kHz to 750kHz . Selectable Burst Mode® operation, pulse skip or forced continuous mode is user controlled to optimize light load efficiency. OPTI-LOOP® compensation allows the transient response to be optimized over a wide range of output capacitance and ESR values, including all ceramic input and output capacitors. Output current sensing is accomplished by measuring the voltage drop across the output inductor (DCR) for highest efficiency, or by using an optional sense resistor in series with the inductor for highest accuracy. Current foldback limits MOSFET heat dissipation during short-circuit and overload conditions.

In addition, the LTC3852 has adjustable soft-start or tracking to control the turn-on characteristics of the supply, and features a precision 0.8V reference with an accuracy of ±1.25% over a -40°C to 125°C operating temperature range. With a maximum duty cycle of 99%, the LTC3852 has a very low dropout voltage, a useful feature for extending run times in battery-powered applications.

The LTC3852 is available in a thermally enhanced 3mm x 5mm QFN-24 package. The 1000-piece price starts at $1.95 and is available from stock. For more information, visit www.linear.com/3852.

Photo Caption: Low Voltage Synchronous Step-Down DC/DC Controller

Summary of Features: LTC3852

- V_{IN} Range: 2.7V to 5.5V for the Charge Pump
- V_{IN} Range: 4V to 38V for the DC/DC Controller
- High Efficiency
- Onboard Charge Pump Provides 5V Gate Drive from a 3.3V Supply Rail
- Strong Onboard MOSFET Drivers
- V_{OUT} Range: 0.8V to 0.99V_{IN}
- Fixed Frequency, Peak Current-Mode Control
- Selectable Burst Mode® Operation, Pulse Skip or Forced Continuous
- DCR or Sense Resistor Current Sensing
- Cycle-by-Cycle Peak Inductor Current Limit (53mV Maximum Threshold)
- Phase-Lockable Fixed Frequency from 250kHz to 750kHhz
- Programmable Soft-Start or Tracking
- ±1.25% Reference Voltage Accuracy over -40°C to +125°C

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, µModule® 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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