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24V, 15A Monolithic Synchronous Step-Down Regulator with Differential Output Sensing & Clock Synchronization

MILPITAS, CA – December 20, 2011 – Linear Technology Corporation introduces the LTC3613, a high frequency controlled on-time synchronous step-down DC/DC converter with differential output voltage sensing and clock synchronization. The controlled on-time, valley current mode architecture enables a very fast transient response by increasing its operating frequency during a transient event, allowing the LTC3613 to recover from a large load step in only a few clock cycles. Its 4.5V to 24V input range supports a wide variety of applications, including most intermediate bus voltages. Integrated N-channel MOSFETs can deliver continuous load currents as high as 15A at output voltages ranging from 0.6V to 5.5V, making it ideal for point-of-load applications.

The LTC3613'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 ±500mV) in trace runs, vias and interconnects. A low 65ns minimum on-time allows for a high step-down ratio power supply at high frequency operation. The operating frequency is selectable from 200kHz to 1MHz and can be synchronized to an external clock. The output current is monitored by sensing the voltage drop across the output inductor's DCR for highest efficiency or by using a sense resistor. Additional features include an onboard bias voltage LDO, soft-start or tracking, overvoltage protection, current limit foldback and external V_{CC} control.

The LTC3613 offers superior total differential output regulation accuracy and is specified to account for all error sources including line, load and differential sensing. The LTC3613's total differential output voltage accuracy is +/-0.25% at 25°C, +/-0.67% from 0ºC to 85ºC and ±1% over the full -40°C to 125°C operating junction temperature range. The LTC3613EWKH is available in a thermally enhanced 7mm x 9mm QFN-56 package. The 1,000-piece price starts at $9.75 each. An industrial temperature grade version, the LTC3613IWKH, is also available, priced at $11.21 each in 1000-piece quantities. Both versions are available from stock. For more information, visit www.linear.com/product/LTC3613

Photo Caption: 24V_{IN}, 15A Monolithic Synchronous Buck Converter with Differential Output Sensing

Summary of Features: LTC3613

- Wide V_{IN} Range: 4.5V to 24V; V_{OUT} Range: 0.6V to 5.5V at up to 15A
- 0.67% Output Voltage Accuracy
- Controlled On-Time Valley Current-Mode Architecture
- Excellent Current-Sharing Capability
- Frequency Programmable from 200kHz to 1MHz & Synchronizable to External Clock
- R_{SENSE} or Inductor DCR Current Sensing with Accurate Current Limit
- Fast Transient Response
- Differential Output Voltage Sensing Allowing 500mV Common-Mode Remote Ground
- $t_{ON(MIN)}$ = 65ns; $t_{OFF(MIN)}$ = 105ns
- Overvoltage Protection & Current Limit Foldback
- Power Good Output Voltage Monitor
- Voltage Tracking Start-Up
- External V_{CC} Input for Bypassing Internal LDO
- Micropower Shutdown: I_Q = 15µA
- 7mm × 9mm 56-pin QFN Package

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 µModule® subsystems.

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