38V Dual DC/DC Controller with Current Mode Control, Sub-Milliohm DCR Sensing, I²C/PMBus Interface & Programmable Loop Compensation

MILPITAS, CA – October 29, 2015 – Linear Technology Corporation announces the LTC3884, a dual output current mode synchronous step-down DC/DC controller with programmable loop compensation and I²C-based PMBus interface. This device enables the use of very low DC resistance (DCR) power inductors (0.3 milliohms) by enhancing the signal-to-noise ratio of the current sense signal to maximize converter efficiency and increase power density.

The LTC3884 operates over an input voltage range of 4.5V to 38V and produces output voltages up to 5.5V. Up to 6 phases can be paralleled and clocked out-of-phase to minimize input and output filtering. When both outputs are paralleled, the LTC3884 provides less than ±5% current mismatch between phases. Alternatively, the LTC3884 can be used with the LTC3874 phase extender, making it ideal for high current requirements up to 240A. Onboard differential amplifiers provide true remote output voltage sensing of both outputs. Applications include power distribution, redundant (n+1) supplies, FPGA, ASIC and processor power.

The LTC3884 has a selectable fixed operating frequency from 200kHz to 1MHz or it can be synchronized to an external clock. Powerful 1.1Ω onboard all N-channel gate drivers minimize MOSFET switching losses. The LTC3884's adjustable and precise current limit threshold can be configured for very low sense voltages from 10mV to 30mV, further reducing power loss. Additional features include input current sensing, two power good output signals, programmable soft-start and programmable fault recovery method.

The LTC3884 is supported by the LTpowerPlay™ software development tool with graphical user interface (GUI). Its serial I²C-based interface enables system designers and remote operators to command and supervise a system's power condition and consumption. The capability to digitally change power supply parameters reduces time-to-market and down time, eliminating what would typically require physical hardware, circuit or system bill-of-material modifications. The LTC3884 simplifies system characterization, optimization and data mining during prototyping, deployment and field operation.

In addition to delivering power to a point-of-load, the LTC3884 features configurability and telemetry monitoring of power and power management parameters over PMBus — an open standard I²C-based digital serial interface protocol. The LTC3884's 2-wire serial interface enables outputs to be margined, tuned and ramped up and down at programmable slew rates with sequenced delay times. Input and output voltages, along with input and output currents and temperature are readable. The device is comprised of fast analog control loops, precision mixed-signal circuitry and EEPROM, and is housed in a 7mm x 7mm QFN-48 package.

To evaluate the performance of the LTC3884, the LTpowerPlay GUI is free for download. USB-to-PMBus converter and demo kits are also available. With ±0.5% maximum DC output error over temperature, ±1.5% current read back accuracy, integrated 16-bit Delta-Sigma ADC and EEPROM, the LTC3884 combines best-in-class analog switching regulator performance with precision mixed-signal data acquisition and nonvolatile fault logging. Channels can accurately share current in both steady state and transient conditions. At start-up, output voltages, switching frequency and channel phase angle assignments can be set by pin-strapping resistors or loaded from internal EEPROM. 1,000-piece price is $6.35 each. For more information, visit www.linear.com/product/LTC3884.

Photo Caption: Dual Synchronous Step-Down Controller with Digital Interface

Summary of Features: LTC3884

- Dual Synchronous Current Mode Step-Down Controller
- V_{IN} Range: 4.5V to 38V
- V_{OUT} Range: 0.5V to 5.5V
- Sub-Milliohm DCR or Sense Resistor Sensing
- Digital Interface for Remote Power System Management
- ±0.5% Maximum DC Output Voltage Error Over Temperature
- ±1.5% Current Read Back Accuracy
- Dual Dedicated Power Good Pins
- Direct Input & Chip Current Sensing
- 7mm x 7mm QFN-48 Package: Includes Data Acquisition & EEPROM

Readable Data:

- V_{IN}, V_{OUT}, I_{IN} & I_{OUT}
- Temperature
- Faults & Warnings
- Fault Log Record Report
- Power Good Signals

Writable Data:

- V_{OUT}, Voltage Sequencing & Margining
- Programmable Loop Compensation
- Digital Soft-Start/Stop Ramp
- Switching Frequency & Phasing
- PWM Control Configuration
- Input/Output Overvoltage & Undervoltage
- Output Current Limit
- Overtemperature, Warning & Fault Limits

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, µModule® subsystems, and wireless sensor network products. For more information, visit www.linear.com

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