



## **Dual Output Synchronous Step-Down DC/DC Controller with Digital Power System Management via I<sup>2</sup>C/PMBus Interface & Onboard EEPROM**

MILPITAS, CA – January 24, 2011 – Linear Technology Corporation announces the [LTC3880/-1](#), a dual output high efficiency synchronous step-down DC/DC controller with I<sup>2</sup>C-based PMBus interface for digital power system management. The device combines best in class analog switching regulator performance with precision mixed signal data conversion for unsurpassed ease of power system design and management, supported by the LTpowerPlay software development system with easy-to-use graphical user interface (GUI).

The LTC3880/-1 allows for digital programming and read back for real-time control and monitoring of critical point-of-load converter functions. Programmable control parameters include output voltage, margining and current limits, input and output supervisory limits, power-up sequencing and tracking, switching frequency and identification and traceability data. On-chip precision data converters and EEPROM allow for the capture and nonvolatile storage of regulator configuration settings and telemetry variables, including input and output voltages and currents, duty cycle, temperature and fault logging.

The LTC3880/-1 can regulate two independent outputs or be configured for a two phase single output. Up to 6 phases can be interleaved and paralleled for accurate sharing among multiple ICs, minimizing input and output filtering requirements for high current and/or multiple output applications. An integrated amplifier provides true differential remote output voltage sensing, enabling high accuracy regulation, independent of board IR voltage drops. Applications include high current ASIC, FPGA and processor supplies in telecom, datacom, computing and storage markets.

Configurations for the LTC3880/-1 are easily saved to internal EEPROM over the device's I<sup>2</sup>C serial interface using Linear Technology's LTpowerPlay GUI-based development software. With configurations stored on-chip, the controller can power up autonomously without burdening the host processor. Default settings can be optionally configured by external resistor

dividers for output voltage, switching frequency, phase and device address. Multiple designs can be easily calibrated and configured in firmware to optimize a single hardware design for a range of applications. The converter loop gain does not change as the power supply parameters are modified, so compensation remains optimized for multiple configurations.

The LTC3880 features high current integrated gate drivers to drive all N-channel power MOSFETs from input voltages ranging from 4.5V to 24V, and it can produce  $\pm 0.50\%$  accurate output voltages from 0.5V to 5.5V with output currents up to 30A per phase over the full operating temperature range. Highest efficiency is achieved by sensing the voltage drop across the output inductor (DCR) to sense current, or an external sense resistor can optionally be used. Programmable DCR temperature compensation cancels the TC of the copper inductor to maintain an accurate and constant current limit over a broad temperature range. The device's minimum on-time of just 90nsec makes the LTC3880/-1 ideal for compact high frequency/high step-down ratio applications. Accurate timing across multiple chips and event-based sequencing allow the optimization of power-up and power-down of complex, multiple rail systems. Additional features include constant frequency current mode control with cycle-by-cycle current limit, adjustable soft start, a synchronizable switching frequency, and programmable GPIO pins to indicate part status and to provide autonomous recovery from faults.

The LTC3880 features an onboard LDO for controller and gate drive power and the LTC3880-1 allows for an external bias voltage for highest efficiency. Both parts are available in a thermally enhanced 6mm x 6mm QFN-40 package. The extended temperature range grade is specified over a -40°C to 85°C operating junction temperature range. The industrial grade part is specified over a -40°C to 125°C operating junction temperature range. Pricing starts at \$5.35 each in 1000-piece quantities. Both versions are available from stock. For more information, visit [www.linear.com/3880](http://www.linear.com/3880)


## Photo Caption: I<sup>2</sup>C/PMBus Dual Synchronous Step-Down DC/DC Controller

### Summary of Features: LTC3880/-1

- Dual Output Synchronous Step-Down DC/DC Controller with Strong Onboard N-Channel MOSFET Drivers
- I<sup>2</sup>C/PMBus Compliant Serial Interface
- Internal Nonvolatile EEPROM Memory
- Programmable Parameters Include V<sub>OUT</sub>, I<sub>LIM</sub>, Sequencing, Margining, OV/UV Levels & Switching Frequency
- System Management Telemetry Variables include V<sub>IN</sub>, I<sub>IN</sub>, V<sub>OUT</sub>, I<sub>OUT</sub>, Duty Cycle, Temperature & Fault Status and Logging
- V<sub>IN</sub> Range: 4.5V to 24V
- V<sub>OUT</sub> Range: 0.5V to 5.5V
- ±0.5% Maximum DC Output Voltage Error over the Full Operating Junction Temperature Range
- Temperature Compensated DCR or R<sub>SENSE</sub> Current Sensing
- PolyPhase<sup>®</sup> for up to 6 Phase Operation
- Phase-Lockable Fixed Frequency from 250kHz to 1MHz

### 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  $\mu$ Module<sup>®</sup> subsystems.

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#### Pressekontakte:

Ralf Stegmann

[ralf@ezwire.com](mailto:ralf@ezwire.com)

Tel: +49 (0) 7131 9234-0

John Hamburger, Director, Marketing Communications

[jhamburger@linear.com](mailto:jhamburger@linear.com)

Tel: +1 408-432-1900 ext 2419

Doug Dickinson, Media Relations Manager

[ddickinson@linear.com](mailto:ddickinson@linear.com)

Tel: +1 408-432-1900 ext 2233