



38V, 10A Rugged Step-Down μ Module Regulator with Fail Safe Load Protection

MILPITAS, CA – October 17, 2012 – Linear Technology Corporation introduces the [LTM4641](#), a 4.5V to 38V input, 0.6V to 6V output, 10A step-down μ Module[®] regulator with comprehensive electrical and thermal protection for loads such as processors, ASICs and high-end FPGAs. The LTM4641 μ Module regulator monitors input voltage, output voltage and temperature conditions. If any user-adjustable trip thresholds are exceeded, the LTM4641 responds quickly within 500ns in the case of an output overvoltage fault, ceasing operation, and if necessary, activating external switches. One switch disconnects the input supply rail while the other discharges the output capacitors to protect the load. Additionally, when any trip threshold is exceeded, the LTM4641 will issue a logic level fault signal which may be used to initiate an orderly emergency shutdown sequence in the system. The adjustable trip thresholds are accurate to within $\pm 2.7\%$ over the full operating temperature range. As a μ Module regulator, the LTM4641 includes power MOSFETs, DC/DC controller, inductor, compensation and the protection logic circuits in a compact surface mount BGA package. The LTM4641 is designed for point-of-load regulation in robotics and industrial instrumentation, as well as rugged environments such as defense and avionics systems.

When any trip threshold is exceeded, the LTM4641's protection circuitry classifies the fault in one of two categories, latching or non-latching. Normal voltage regulation will automatically resume once a non-latching fault such as input undervoltage, bias input undervoltage or input overvoltage has cleared. For latching faults such as an output overvoltage

or a second input overvoltage threshold, the system must cycle the input power or supply a logic level signal to the LTM4641 in order to resume normal operation. An overtemperature fault can be classified by the user as a latching or non-latching fault by setting a logic level pin. The LTM4641 can be configured to autonomously restart after latchoff fault conditions have cleared.

The output voltage is user adjustable from 0.6V to 6V with $\pm 1.5\%$ total accuracy over line, load and temperature. Additional features include output current sharing for loads requiring more than 10A, externally adjustable soft start, output overcurrent protection, switching frequency and output voltage tracking.

The LTM4641 is packaged a thermally efficient 15mm x 15mm x 5.01mm RoHS compliant BGA with guaranteed operation over the -40°C to $+125^{\circ}\text{C}$ (E grade and I grade) or -55°C to $+125^{\circ}\text{C}$ (mp grade) internal temperature range. Pricing starts at \$25.95 each for 1,000-piece quantities. The LTM4641 is available for immediate delivery from stock. For more information, visit www.linear.com/product/LTM4641.


Photo Caption: Step-Down μ Module[®] Regulator with Advanced Load Protection

Summary of Features: LTM4641

- $\pm 2.7\%$ Accurate Customizable Overtemperature, Overvoltage & Undervoltage Fault Thresholds with Active Load Protection
- 4.5V to 38V Input Voltage Range
- 0.6V to 6V Output Voltage Range with $\pm 1.5\%$ Accuracy over Line, Load & Temperature
- Output Current up to 10A
- Supports Paralleling of Outputs
- Compact, Thermally Enhanced 15mm x 15mm x 5.01mm BGA 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, μ Module[®] subsystems, and wireless sensor network products. For more information, visit www.linear.com

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