

DESIGN NOTES

8A Low Voltage, Low Profile DC/DC μ Module Regulator in 9mm \times 15mm Package Weighs Only 1g

Design Note 430

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Introduction

In communications, industrial and other high power systems, board-mounted point-of-load (POL) DC/DC power supplies simplify thermal management and offer high performance. An ideal POL power supply module takes a minimal amount of space and mounts on the board much like other surface mount ICs without special tooling. It should also demonstrate exceptional thermal performance with excellent efficiency and low power dissipation.

8A DC/DC μ Module™ Regulator in an IC Form Factor

The LTM4608[®] μ Module regulator is a complete high density power supply in a low profile (15mm \times 9mm \times 2.8mm) LGA surface mount package (Figure 1). Its small form factor houses the switching controller, MOSFETs, inductor and all support components, and weighs only 1g. At this size, it can be mounted on the back side of a system board, taking advantage of otherwise unused space.



Figure 1. The LTM4608 Offers High Power Density in a 9mm \times 15mm \times 2.8mm LGA Package

The LTM4608 operates from an input supply range of 2.375 to 5.5V, and a single resistor is all that is needed to set the output voltage within a 0.6V to 5V output range. Its high efficiency design and low thermal impedance package delivers up to 8A continuous current.

Wealth of Features

The LTM4608's 1.5MHz switching frequency and current mode architecture allow it to react quickly to line and load transients without sacrificing stability. Cycle-by-cycle current mode control also enables excellent current sharing for parallel operation. The integrated clock enables multiphase operation and frequency synchronization,

and a frequency spread spectrum feature can also be activated to further reduce switching noise harmonics. The device supports output voltage tracking or simpler supply rail sequencing. Programmable output voltage margining is supported for $\pm 5\%$, $\pm 10\%$, and $\pm 15\%$ levels. Fault protection features include over voltage protection, over current protection, and thermal shutdown.

Quick and Easy Design

Figure 2 shows a typical 1.8V output design; its efficiency is shown in Figure 3. Because the LTM4608 includes two integrated 10 μ F ceramic capacitors, additional input capacitors are only needed for large load steps up to the full 8A level. Linear Technology provides a μ Module

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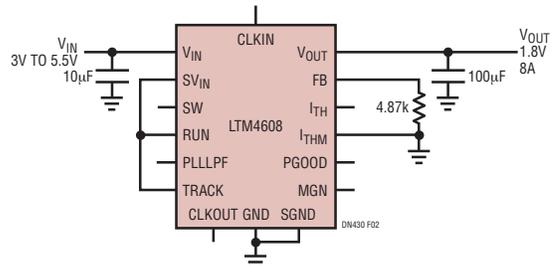


Figure 2. Few Components Are Required for a 1.8V/8A Application

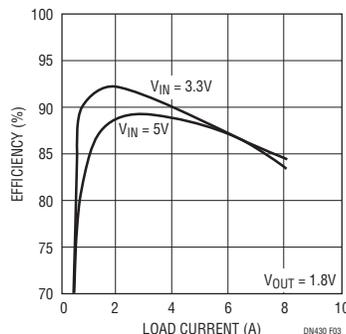


Figure 3. Efficiency of the Application in Figure 2

