



Dual (2.5A + 1.5A) Synchronous StepDown DC/DC Converter Delivers 95% Efficiency & Operates from 3.4V to 42V Inputs

Description

The **LT8616** is a 42V input capable, high efficiency dual synchronous monolithic step-down switching regulator. Its dual channel design delivers independent 2.5A and 1.5A continuous current to outputs as low as 0.8V. A dual channel synchronous rectification topology delivers up to 95% efficiency while Burst Mode[®] operation keeps quiescent current under 6.5 μ A (both channels enabled) in no-load standby conditions, making it ideal for always-on systems. Switching frequency can be programmed from 200kHz to 3MHz and is synchronizable throughout this range.

42V, Dual Output 3MHz Synchronous Step-Down DC/DC Converter



The LT8616's 35ns minimum on-time enables 16V_{IN} to 1.8V_{OUT} step-down conversions, while switching at 2MHz helps designers avoid critical noise-sensitive frequency bands, such as AM radio while having a very compact solution footprint. Its 3.4V to 42V input voltage range makes it ideal for automotive applications which must regulate through cold-crank and stop-start scenarios with minimum input voltages as low as 3.4V and load dump transients in excess of 40V. Each channel of the LT8616 maintains a minimum dropout voltage of only 400mV (at 1A) under all conditions, enabling it to excel in scenarios such as automotive cold-crank. The LT8616's 28-lead thermally enhanced TSSOP package and high switching frequency keeps external inductors and capacitors small, providing a compact, thermally efficient footprint.

The LT8616 utilizes dual internal top and bottom high efficiency power switches with the necessary boost diodes, oscillator, control and logic circuitry integrated into a single die. Each channel switches 180 degrees out-of-phase to reduce output ripple. Each channel has a separate input for added design flexibility. Low ripple Burst Mode operation maintains high efficiency at low output currents while keeping output ripple below 15mV_{p-p}. Unique design techniques and a new high speed process enable high efficiency over a wide input voltage range, and the LT8616's current-mode topology provides fast transient response and excellent loop stability. Other features include internal compensation, power good flags, output soft-start/tracking and thermal protection.

The LT8616 is available in a thermally enhanced 28lead TSSOP package. Three temperature grades are available, with operation from -40°C to 125°C (junction) for the extended (E) and industrial (I) grades and a high temperature (H) grade of -40°C to 150°C.

Summary of Features: LT8616

- Wide Input Voltage Range: 3.4V to 42V
- 2.5A and 1.5A Buck Regulators with Separate Inputs
- Fast Minimum Switch On-Time: 35ns
- Ultralow Quiescent Current Burst Mode®
- Operation:
 - 6.5μA I_Q Regulating 12V_{IN} to 5V_{OUT} and 3.3V_{OUT}
 - Output Ripple < 15mV
- 180° Out-of-Phase Switching
- Adjustable and Synchronizable: 200kHz to 3MHz
- Accurate 1V Enable Pin Thresholds
- Internal Compensation
- Output Soft-Start and Tracking
- TSSOP Package: Output Stays at or Below Regulation Voltage During Adjacent Pin Short or When a Pin Is Left Floating
- Thermally Enhanced 28Lead TSSOP Package

LT8616

