TPS54331 3-A, 28-V Input, Step Down DC-DC Converter With Eco-mode™

1 Features

- 3.5 to 28-V Input Voltage Range
- Adjustable Output Voltage Down to 0.8 V
- Integrated 80-mΩ High-Side MOSFET Supports up to 3-A Continuous Output Current
- High Efficiency at Light Loads With a Pulse Skipping Eco-mode™
- Fixed 570 kHz Switching Frequency
- Typical 1-μA Shutdown Quiescent Current
- Adjustable Slow-Start Limits Inrush Currents
- Programmable UVLO Threshold
- Overvoltage Transient Protection
- Cycle-by-Cycle Current Limit, Frequency Fold Back, and Thermal Shutdown Protection
- Available in Easy-to-Use SOIC8 Package or Thermally Enhanced SOIC8 PowerPAD™ Package
- Create a Custom Design with WEBENCH Tools

2 Applications

- Consumer Applications such as Set-Top Boxes, CPE Equipment, LCD Displays, Peripherals, and Battery Chargers
- Industrial and Car-Audio Power Supplies
- 5-V, 12-V, and 24-V Distributed Power Systems

3 Description

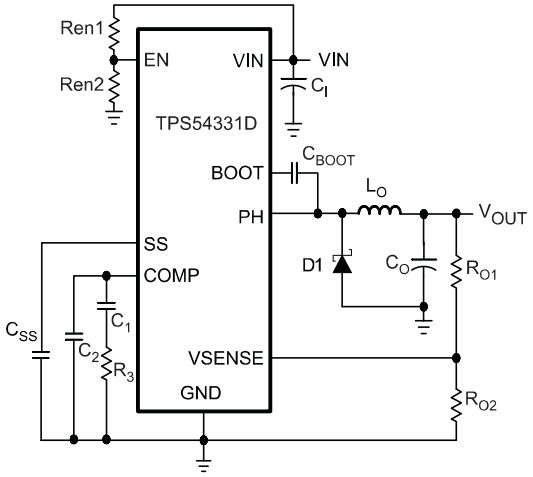
The TPS54331 device is a 28-V, 3-A non-synchronous buck converter that integrates a low $R_{DS(on)}$ high-side MOSFET. To increase efficiency at light loads, a pulse skipping Eco-mode feature is automatically activated. Furthermore, the 1-μA shutdown supply-current allows the device to be used in battery-powered applications. Current mode control with internal slope compensation simplifies the external compensation calculations and reduces component count while allowing the use of ceramic output capacitors. A resistor divider programs the hysteresis of the input undervoltage lockout. An overvoltage transient protection circuit limits voltage overshoots during startup and transient conditions. A cycle-by-cycle current-limit scheme, frequency foldback and thermal shutdown protect the device and the load in the event of an overload condition. The TPS54331 device is available in an 8-pin SOIC package and 8-pin SO PowerPAD package that have been internally optimized to improve thermal performance.

Device Information(1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
TPS54331	SOIC (8)	4.90 mm × 3.90 mm
	SO PowerPAD (8)	

(1) For all available packages, see the orderable addendum at the end of the datasheet.

4 Simplified Schematic



TPS54331 (D Package) Efficiency