

Brief Description

The ZSPM9010 DrMOS is a fully optimized, ultra-compact, integrated MOSFET plus driver power stage solution for high-current, high-frequency, synchronous buck DC-DC applications. The ZSPM9010 incorporates a driver IC, two power MOSFETs, and a bootstrap Schottky diode in a thermally enhanced, ultra-compact PQFN40 package (6mmx6mm).

With an integrated approach, the ZSPM9010's complete switching power stage is optimized for driver and MOSFET dynamic performance, system inductance, and power MOSFET $R_{DS(ON)}$. It uses innovative high-performance MOSFET technology, which dramatically reduces switch ringing, eliminating the snubber circuit in most buck converter applications.

An innovative driver IC with reduced dead times and propagation delays further enhances performance. A thermal warning function (THWN) warns of potential over-temperature situations. The ZSPM9010 also incorporates features such as Skip Mode (SMOD) for improved light-load efficiency with a tri-state 3.3V pulse-width modulation (PWM) input for compatibility with a wide range of PWM controllers.

The ZSPM9010 DrMOS is compatible with IDT's ZSPM1000, a leading-edge configurable digital power-management system controller for non-isolated point-of-load (POL) supplies.

Benefits

- Fully optimized system efficiency: >93% peak
- Clean switching waveforms with minimal ringing
- 72% space-saving compared to conventional discrete solutions
- Optimized for use with IDT's ZSPM1000 true digital PWM controller

Features

- Based on the Intel® 4.0 DrMOS standard
- High-current handling: up to 50A
- High-performance copper-clip package
- Tri-state 3.3V PWM input driver
- Skip Mode (low-side gate turn-off) input (SMOD#)
- Warning flag for over-temperature conditions
- Driver output disable function (DISB# pin)
- Internal pull-up and pull-down for SMOD# and DISB# inputs, respectively
- Integrated Schottky diode technology in the low-side MOSFET
- Integrated bootstrap Schottky diode
- Adaptive gate drive timing for shoot-through protection
- Under-voltage lockout (UVLO)
- Optimized for switching frequencies up to 1MHz

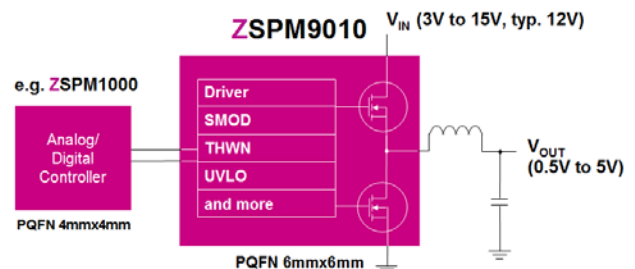
Available Support

- ZSPM8010-KIT: Open-Loop Evaluation Board for ZSPM9010

Physical Characteristics

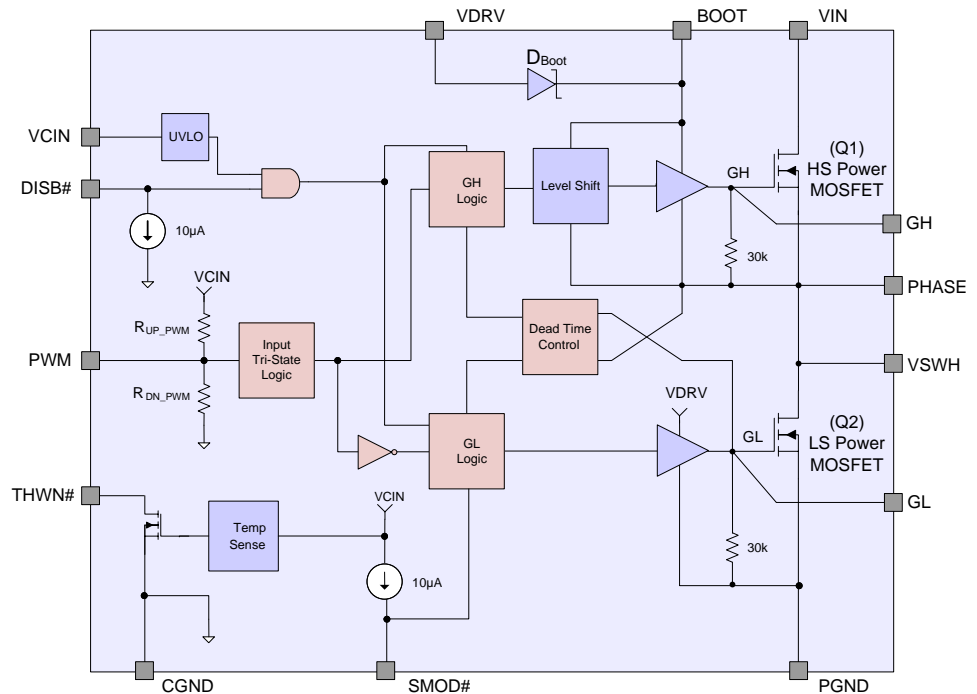
- Operation temperature: -40°C to +125°C
- V_{IN} : 3V to 15V (typical 12V)
- I_{OUT} : 40A (average), 50A (maximum)
- Low-profile SMD package: 6mmx6mm PQFN40
- IDT green packaging and RoHS compliant

Typical Application



ZSPM9010 Block Diagram

- Typical Applications**
- Telecom switches
 - Servers and storage
 - Desktop computers
 - Workstations
 - High-performance gaming motherboards
 - Base stations
 - Network routers
 - Industrial applications



Ordering Information

Product Sales Code	Description	Package
ZSPM9010ZA1R	ZSPM9010 Lead-Free PQFN40 — Temperature range: -40°C to +125°C	Reel
ZSPM8010-KIT	Open-Loop Evaluation Board for ZSPM9010	Kit



Corporate Headquarters
6024 Silver Creek Valley Road
San Jose, CA 95138
www.IDT.com

Sales
1-800-345-7015 or 408-284-8200
Fax: 408-284-2775
www.IDT.com/go/sales

Tech Support
www.IDT.com/go/support

DISCLAIMER Integrated Device Technology, Inc. (IDT) reserves the right to modify the products and/or specifications described herein at any time, without notice, at IDT's sole discretion. Performance specifications and operating parameters of the described products are determined in an independent state and are not guaranteed to perform the same way when installed in customer products. The information contained herein is provided without representation or warranty of any kind, whether express or implied, including, but not limited to, the suitability of IDT's products for any particular purpose, an implied warranty of merchantability, or non-infringement of the intellectual property rights of others. This document is presented only as a guide and does not convey any license under intellectual property rights of IDT or any third parties.

IDT's products are not intended for use in applications involving extreme environmental conditions or in life support systems or similar devices where the failure or malfunction of an IDT product can be reasonably expected to significantly affect the health or safety of users. Anyone using an IDT product in such a manner does so at their own risk, absent an express, written agreement by IDT.

Integrated Device Technology, IDT and the IDT logo are trademarks or registered trademarks of IDT and its subsidiaries in the United States and other countries. Other trademarks used herein are the property of IDT or their respective third party owners. For datasheet type definitions and a glossary of common terms, visit www.idt.com/go/glossary. All contents of this document are copyright of Integrated Device Technology, Inc. All rights reserved