

## Brief Description

The ZSPM9015 is IDT's next-generation, fully optimized, ultra-compact, integrated MOSFET plus driver power stage solution for high-current, high-frequency, synchronous buck DC-DC applications. The ZSPM9015 integrates a driver IC, two power MOSFETs, and a bootstrap Schottky diode into a thermally enhanced, ultra-compact 6x6mm package.

With an integrated approach, the complete switching power stage is optimized with regard to driver and MOSFET dynamic performance, system inductance, and power MOSFET  $R_{DS(ON)}$ . The ZSPM9015 uses innovative high-performance MOSFET technology, which dramatically reduces switch ringing, eliminating the need for a snubber circuit in most buck converter applications.

A driver IC with reduced dead times and propagation delays further enhances the performance. A thermal warning function indicates if a potential over-temperature situation ( $>150^{\circ}\text{C}$ ) has occurred. An automatic thermal shutdown activates if an over-temperature condition ( $>180^{\circ}\text{C}$ ) is detected. The ZSPM9015 also incorporates a Zero Current Detection Mode (ZCD) for improved light-load efficiency and provides a tri-state 3.3V and 5V PWM input for compatibility with a wide range of PWM controllers.

The ZSPM9015 DrMOS is compatible with IDT's ZSPM1000, a leading-edge configurable digital power-management system controller designed for non-isolated point-of-load (POL) supplies.

## Features

- High-current handling: up to 35A
- PWM input capable of 3.3V and 5V
- Optimized for switching frequencies up to 1MHz
- Zero-current detection and under-voltage lockout (UVLO)
- Thermal shutdown and warning flag for over-temperature conditions
- Driver output disable function (DISB# pin)
- Integrated Schottky diode technology in the low-side MOSFET
- Integrated bootstrap Schottky diode
- Adaptive gate drive timing for shoot-through protection

## Benefits

- Improved efficiency with zero current detection
- Clean switching waveforms with minimal ringing
- Based on the Intel® 4.0 DrMOS standard
- 72% space-saving compared to conventional discrete solutions
- High current handling
- Optimized for use with IDT's ZSPM1000 true digital PWM controller

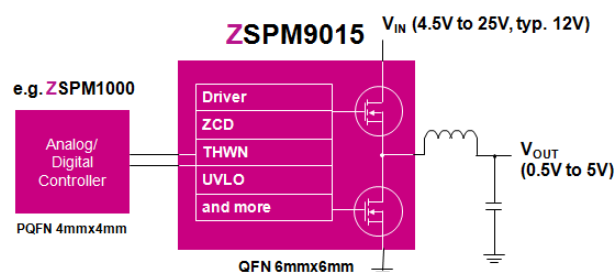
## Available Support

- ZSPM8015-KIT: Evaluation Kit for ZSPM9015

## Physical Characteristics

- Operation temperature:  $0^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$
- $V_{IN}$ : 4.5V to 25V (typical 12V)
- $I_{OUT}$ : up to 35A
- Low-profile SMD package: 6mmx6mm QFN40
- IDT green packaging and RoHS compliant

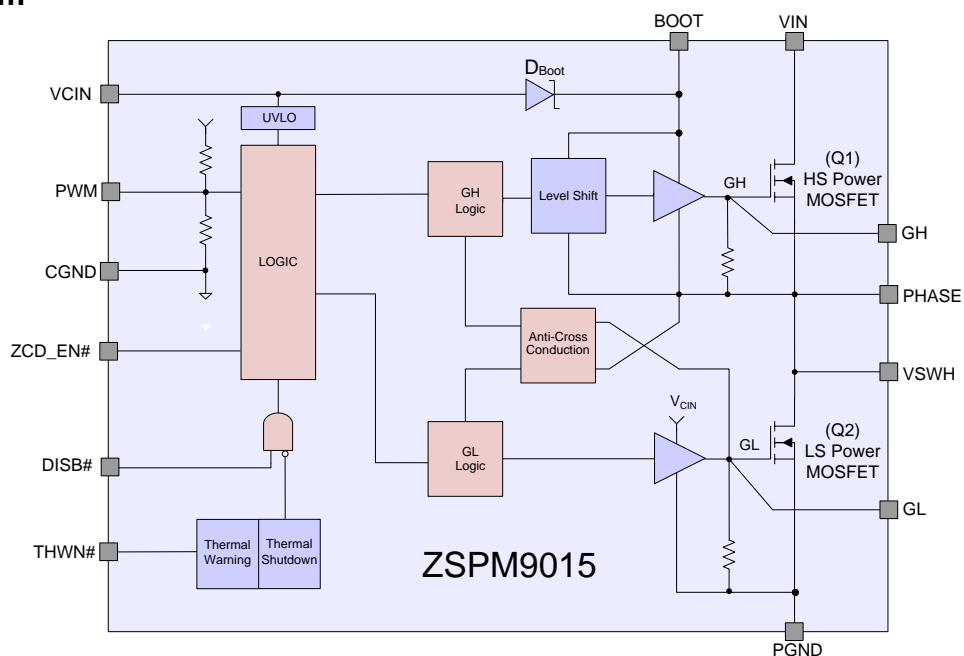
## Typical Application



## ZSPM9015 Block Diagram

### Typical Applications

- High-performance gaming motherboards
- Compact blade servers, Vcore and non-Vcore DC-DC converters
- Desktop computers, Vcore and Non-Vcore DC-DC converters
- Workstations
- High-current DC-DC point-of-load converters
- Networking and telecom microprocessor voltage regulators
- Small form-factor voltage regulator modules



## Ordering Information

Product Sales Code	Description	Package
ZSPM9015ZI1R	ZSPM9015 RoHS-Compliant QFN40 – Junction temperature range: 0°C to 150°C	Reel
ZSPM8015-KIT	Evaluation Kit for ZSPM9015	Kit

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### Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,  
Koto-ku, Tokyo 135-0061, Japan  
[www.renesas.com](http://www.renesas.com)

### Contact Information

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