

Brief Description

The ZSPM1005 is a configurable true-digital single-phase PWM controller for high-current, non-isolated DC/DC supplies. It operates as a synchronous step-down converter in a single-rail and single-phase configuration.

The ZSPM1005 integrates a digital control loop, optimized for maximum flexibility and stability as well as load step and steady-state performance. In addition, a rich set of protection and monitoring functions is provided. To facilitate user configuration of the part, a set of configuration options can be pre-programmed in the ZSPM1005 that can be selected by setting the values of two external resistors.

IDT's Pink Power Designer™; a PC-based, user-friendly interface to the ZSPM1005, can be used to expedite the design of the digital compensator. It offers intuitive configuration methods for additional features, such as protection and sequencing. Once the part is programmed, the resistor options can be used to select the required configuration without a digital bus.

Features

- Programmable digital control loop
- Advanced, digital control techniques
 - Tru-sample Technology™
 - State-Law Control™ (SLC)
 - Sub-cycle Response™ (SCR)
- Improved transient response and noise immunity
- Protection features
 - Over-current protection
 - Over-voltage protection (VIN, VOUT)
 - Under-voltage protection (VIN, VOUT)
 - Overloaded startup
 - Restart and delay
- Support for SMOD and ZCD drivers
- Fuse-based one-time programmable (OTP) nonvolatile memory for improved reliability
- Operation from a single 5V or 3.3V supply
- 2-pin configuration for compensation, output voltage, and more

Benefits

- Fast configuration and design flexibility improves time-to-market
- Simplified design and integration
- FPGA designer-friendly solution
- Highest power density with smallest footprint
- Pin-to-pin compatible with the ZSPM1000 PWM controller enabling point-of-load power module platform designs with or without digital communication
- Higher energy efficiency across all output loading conditions

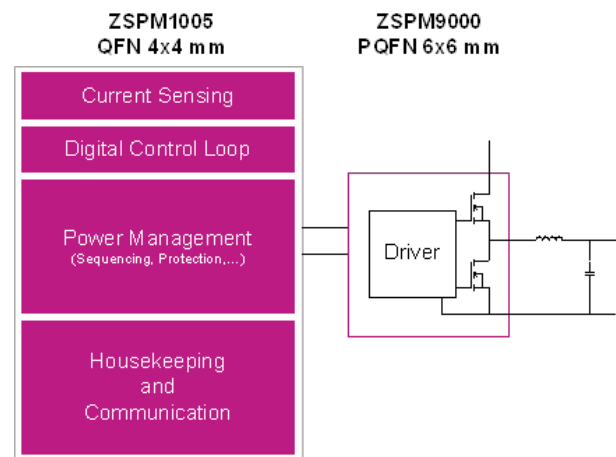
Available Support

- Evaluation Kit
- PC-based Pink Power Designer™

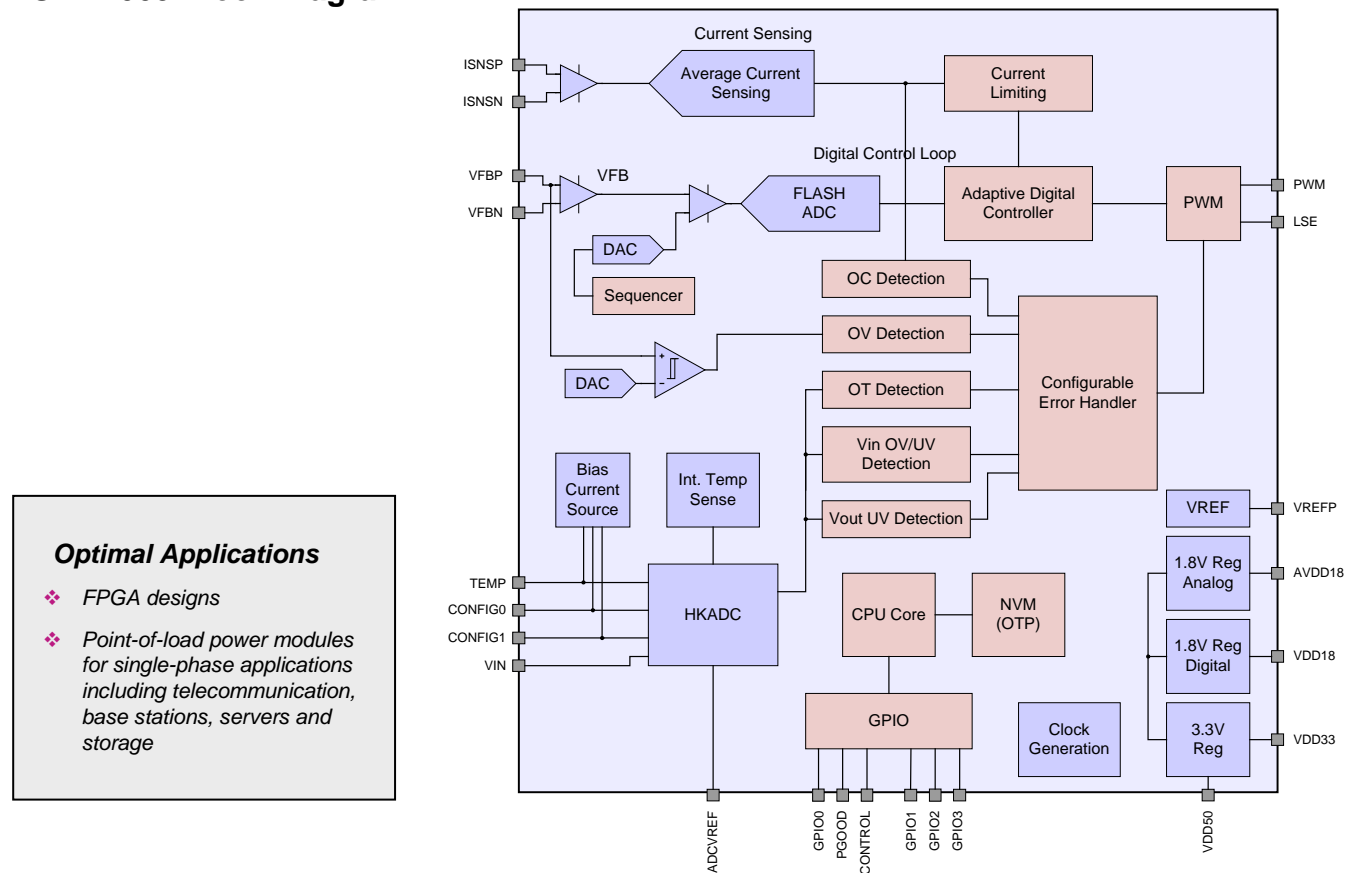
Physical Characteristics

- Operation temperature: -40°C to +125°C
- V_{OUT} max: 5V
- Lead free (RoHS compliant) 24-pin QFN package (4mm x 4mm)

ZSPM1005 Typical Application Diagram



ZSPM1005 Block Diagram



Ordering Information

| Product Sales Code | Description | Package |
|--------------------|--|---------|
| ZSPM1005ZA1R 0 | ZSPM1005 Lead-free QFN24 — Temperature range: -40°C to +125°C | Reel |
| ZSPM8001-KIT | Integrated Evaluation Kit for ZSPM9060 and ZSPM1005 - closed loop evaluation board | Kit |



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