TPS537G4S Dual-Channel DDCAP+™, Step-Down, Multiphase Controller with PWMVID, AVSBus® 1.4, and PMBus® Interfaces

1 Features

- Input voltage range: 4.5V to 17V
- Output voltage range: 0.25V to 5.5V
- PWMVID, AVSBus® 1.4 and PMBus® Interfaces
- Nvidia OVR16 spec compliant
- Dual output with 16 phases, flexible phase order assignment, and up to 4x native phase stacking
- Enhanced dual-edge D-CAP+ (DDCAP+) control loop to provide best-in-class transient performance with excellent dynamic current sharing
- Native trans-inductor voltage regulator (TLVR) topology support including open detect
- Optional PMBus secure device security Level 2 support from supply-chain to end-of-life protection
- Telemetry options with peak detection, time above programmable thresholds, and NVM storage
- Pin-selectable NVM configurations and PMBus address for reduced programming spins
- Individual phase current calibration and reporting
- PSI pin support for quick power state changes
- Fast phase-adding for undershoot reduction
- Fully compatible with TI power stages and power modules for high-density power delivery
- Patented AutoBalance™ phase current balancing
- Accurate, adjustable voltage positioning
- Selectable per-phase current limit
- Selectable current limit on total average current
- Analog IMON voltage output with programmable gain and offset options
- Frequency spread spectrum support
- Operating temperature from -40°C to 125°C

2 Applications

- Datacenter compute
- AI accelerator module
- High performance computing
- Campus and branch switches

3 Description

The TPS537G4S family of step-down controllers are high-performance, dual output multiphase controllers. with 16 phases. The controller has a high degree of programmability with support for up to eight separate pin-selectable configurations. Advanced control features such as dual-edge D-CAP+™ (DDCAP+) architecture with native TLVR support and full PID loop provide fast transient response and good current sharing minimizes output capacitance requirements and saves system cost. Controllers are fully compatible with relevant TI smart power stages. The device also provides optional phase shedding for efficiency improvements at different loads. All programmable parameters can be reported and configured by the PMBus interface and can be stored in NVM as the new default values to minimize the external component count.

Package Information

PART NUMBER	PACKAGE	PACKAGE SIZE[1]
TPS537G4SZLFR	ZLF (FCLGA, 56)	7.00 × 7.00mm

(1) The package size (length × width) is a nominal value and includes pins, where applicable.
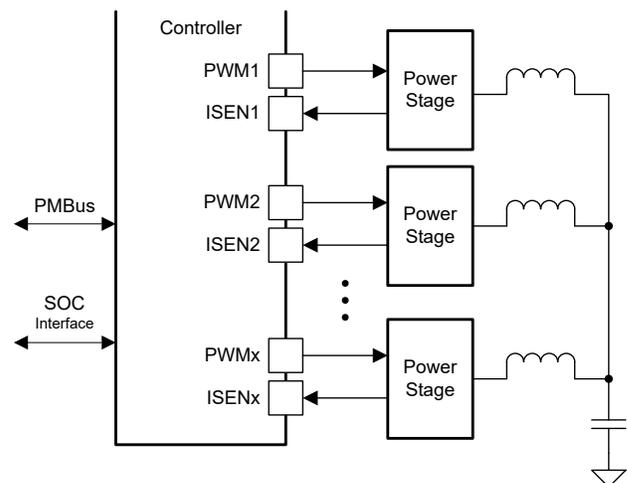
Simplified Application

PRODUCT PREVIEW

4 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

4.1 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

4.2 Support Resources

TI E2E™ support forums are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

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4.3 Trademarks

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4.4 Electrostatic Discharge Caution

This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

4.5 Glossary

TI Glossary   This glossary lists and explains terms, acronyms, and definitions.

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