CSDM65695x Quad-Phase Buck Smart Power Stage Module

1 Features

- Topside-cooled 9mm x 10mm x 5mm LGA package, industry common footprint
- Integrated inductor
- High output current capability:
  - Peak current: 280A
  - Continuous current: 160A RMS (Subject to thermal boundary condition)
- Operating VIN input voltage: 4.5V to 16V
- Operating VCC Bias: 4.5V to 5.5V
- High-frequency operation (up to 2MHz)
- Integrated clamping circuitry for avalanche free operation
- Intergrated current sense with 5 µA/A gain
- Body braking mode (BB)
- Forced continuous conduction mode (FCCM) operation
- Green, RoHS compliant without exemption, and completely Pb free
- Fault detection
  - High-side short (HSS)
- Fault protection
  - Over temperature (OT)
  - Cycle-by-cycle negative over current limiting (NOC)
  - Over current protection (OCP)
  - BOOT UVLO

2 Applications

- Data center & enterprise computing rack server
- Hardware accelerator
- Network interface card (NIC)
- ASIC and high performance client
- ASIC power for networking and communications
- High phase count buck regulator solutions

3 Description

The CSDM65695x family of devices are 4-phase smart power stage modules with high peak current capability. The device family is highly optimized design for use in high-power, high-density synchronous buck converter applications. This product family integrates the driver IC and power MOSFETs into one Pb-free monolithic design to complete the power stage switching function. There are VIN and VCC bypass capacitors integrated into the package for minimum loop inductance and improved ringing.

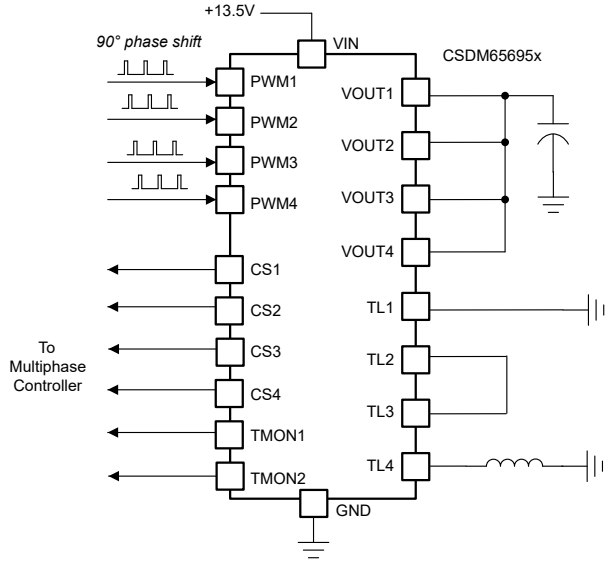
This combination produces high-current, high-efficiency, and high-speed switching capability in a small industry standard 9 mm x 10 mm x 5mm footprint.

CSDM65695x integrates accurate current sensing and temperature sensing functionality to simplify system design and improve accuracy. This power stage module also includes cycle-by-cycle current limiting, over temperature and short circuit protection, and is designed to be compatible with TPS537xx series controllers.

Package Information

PART NUMBER	INTEGRATED INDUCTOR	PACKAGE SIZE(1)
CSDM65695T	Coupled inductor (TLVR)	LGA 9 mm x 10 mm x 5 mm

(1) The package size (length x width x height) is a nominal value and includes pins, where applicable.



Simplified Application Diagram

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4 Device and Documentation Support

4.1 Device Support

4.1.1 Third-Party Products Disclaimer

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4.6 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.

4.7 Glossary

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

5 Revision History

DATE	REVISION	NOTES
March 2026	*	Initial release

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