# CSDM65295x Dual-Phase Buck Smart Power Stage Module

## 1 Features

- Topside-cooled 9 mm x 10 mm x 5 mm LGA package, industry common footprint
- Integrated inductor
- High output current capability:
  - Peak current: 180A
  - Continuous current: 130A RMS
  - (Subject to thermal boundary condition)
- Operating VIN input voltage: 4.5V to 16V
- Operating VDD Bias: 4.5V to 5.5V
- High-frequency operation (up to 2MHz)
- Integrated clamping circuitry for avalanche free operation
- Temperature compensated bi-directional current sense with current mode reporting (5µA/A)
- 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 and 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 CSDM65295x family of devices are 2-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 VDD bypass capacitors integrated into the package for minimum loop inductance and improved ringing.

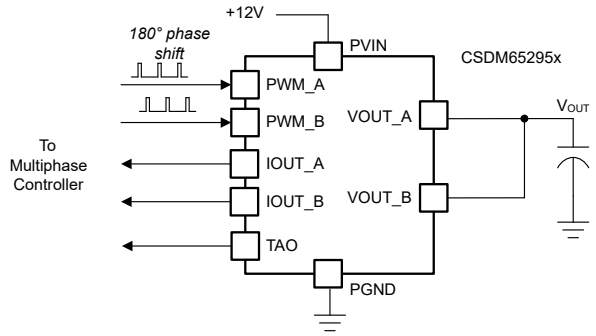
This combination produces high-current, high-efficiency, and high-speed switching capability in a small industry standard 9mm × 10mm × 5 mm footprint.

CSDM65295x 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) |
|---|---|---|
| CSDM65295 | Traditional inductor (VR) | LGA 9mm × 10mm x 5 mm |
| CSDM65295T | Coupled inductor (TLVR) | |

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




**Simplified Application Diagram**

# 4 Device and Documentation Support

## 4.1 Device Support

### *4.1.1 Third-Party Products Disclaimer*

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## 4.2 Documentation Support

## 4.3 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.

## 4.4 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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## 4.5 Trademarks

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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

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

# 5 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

| DATE | REVISION | NOTES |
|---|---|---|
| February 2026 | * | Initial Release |

## 6 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

## PACKAGING INFORMATION

| Orderable part number | Status (1) | Material type (2) | Package \| Pins | Package qty \| Carrier | RoHS (3) | Lead finish/ Ball material (4) | MSL rating/ Peak reflow (5) | Op temp (°C) | Part marking (6) |
|---|---|---|---|---|---|---|---|---|---|
| PCSDM65295TVCQ | Preview | Preproduction | QFN-FCMOD (VCQ) \| 72 | 2500 \| LARGE T&R | - | Call TI | Call TI | - | |
| PCSDM65295VCQ | Preview | Preproduction | QFN-FCMOD (VCQ) \| 72 | 2500 \| LARGE T&R | - | Call TI | Call TI | - | |

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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Last updated 10/2025