

# CODE-FREE GATE DRIVERS FOR DATA-CENTER COOLING FANS

Purpose-Built for High-Speed Three-Phase Cooling Fans

Eliminate unneeded power consumption, increase thermal efficiency, and reduce data-center costs: Allegro ICs with integrated MOSFETS or gate drivers include a power loss brake function that stops fans that have lost power or are not working properly.

When data-center fans malfunction or lose power, backflow causes them to reverse rotate. To compensate for the resulting airflow, other fans work harder, which increases power consumption. The external circuitry that can function as a power loss brake to prevent reverse rotation adds complexity to bills of materials and requires software coding, which increases time to market. These solutions are also typically limited to use in 2U+ fans because the additional components do not fit into a 1U fan.

Our portfolio of three-phase BLDC motor drivers includes solutions with integrated MOSFETs or gate drivers, as well as options for power loss braking for high efficiency. These motor drivers help system designers reduce R&D overhead, simplify motor tuning, and improve time to market.

As the leading code-free solution for data-center cooling fans, these drivers incorporate a sensorless sinusoidal drive to minimize vibration. Innovative embedded algorithms eliminate the need for an additional Hall-effect position sensor and motor control unit. A flexible closed-loop speed control system is

integrated into the IC. The EEPROM is used to tailor the common functions of the fan speed curve to a specific application. With the graphical user interface, the EEPROM eliminates the need for a microprocessor-based system, minimizes programming requirements, and reduces costs.

Featured products in our three-phase BLDC motor driver portfolio include A89331, a three-phase sensorless fan driver offered in either a 28-contact 5 mm × 5 mm QFN with exposed pad (suffix ET) or a 20-lead TSSOP with exposed pad (suffix LP); and A89332, a three-phase sensorless fan controller offered in a 26-contact 4 mm × 4 mm QFN with exposed pad (suffix EX). The A89332 sizing is ideal for enabling higher speed in 1U fans with donut-shaped circuit boards. The reduced need for external components that comes with these and other Allegro solutions can help optimize system costs and improve reliability.



**Allegro three-phase sensorless BLDC gate drivers are purpose-built for 1U high-speed and 2U+ fans.**

## Featured Products and Benefits

### A89331/A89331-1: Three Phase Sensorless Fan Driver

- Closed-loop speed control
- Overtoltage protection
- Power loss brake
- Fault mode brake
- Speed curve configuration via EEPROM
- Sinusoidal modulation for reduced audible noise and low vibration
- Sensorless (no Hall sensors required)
- Trapezoidal drive option at high speed
- Frequency generator (FG) speed output

### A89332/A89332-1: Three-Phase Sensorless Fan Controller

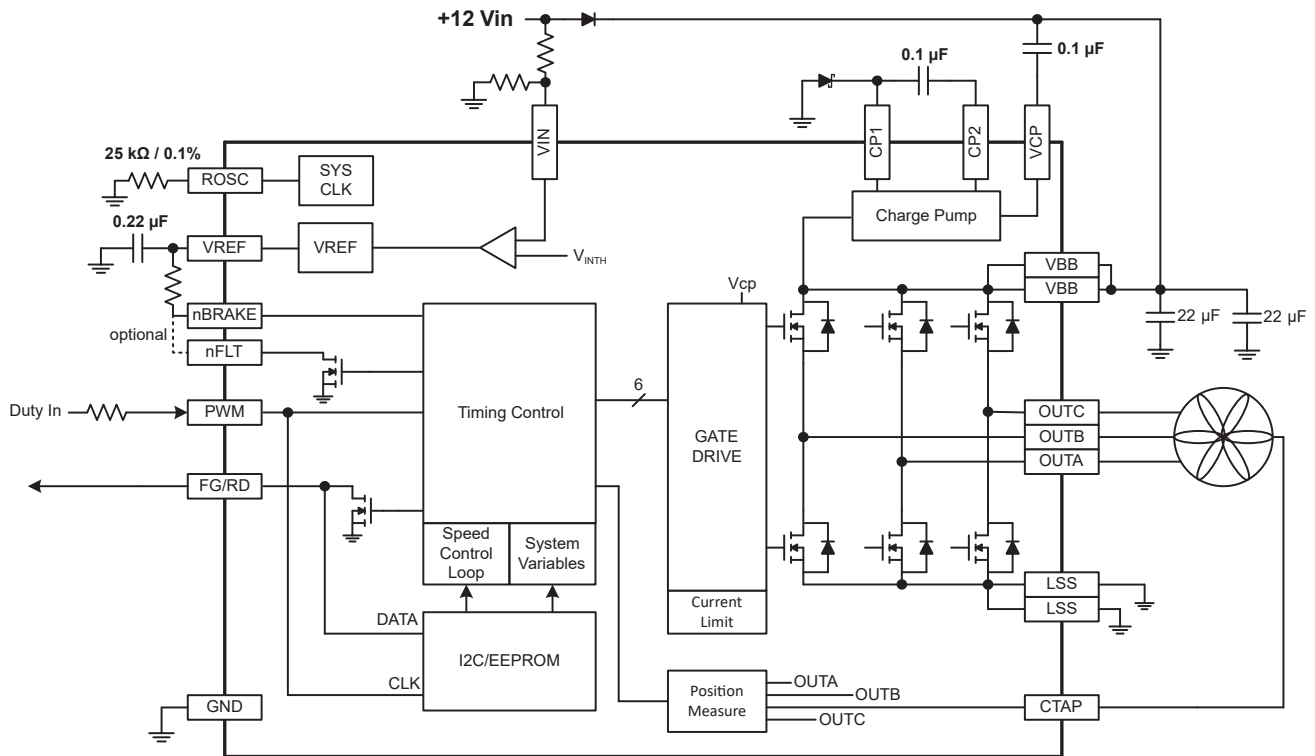
- High maximum voltage (36 V)
- Power loss brake function
- Fault power loss brake
- Power disconnect brake
- Rotor detect (RD) logic tailored to common data-center fan requirements
- Programming via RD pin
- Change logic output of FG/RD to 18 V
- Trapezoidal drive option at high speed

# Improve Cooling Control and Reduce Energy Use and Cost

## Applications

- 12 V server/data-center cooling fans
- Power supply unit cooling fans
- High-speed cooling fans
- Industrial and consumer blowers, fans, and pumps

## Typical Application



## Selection Guide

Part Number	Drive Type	System	AC Loss	Power Loss Brake	MOSFET Integrated	Package	
<a href="#">A89331</a>	Sine	12 V		✓	✓	20-lead TSSOP (Suffix LP) or 5 x 5 QFN (Suffix ET)	
<a href="#">A89331-1</a>	Sine	12 V	✓		✓		
<a href="#">A89332</a>	Sine	12 V		✓		4 x 4 QFN (Suffix EX)	
<a href="#">A89332-1</a>	Sine	12 V	✓				

To learn more about the Allegro family of products and to explore available design resources, visit [allegromicro.com](http://allegromicro.com).

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