

## Three-Phase Sensorless Fan Controller

### FEATURES AND BENEFITS

- Closed-loop speed control
- Power loss brake
- Fault mode brake
- Configurable rotor detect (RD) or frequency generator (FG) output
- Speed curve configuration via EEPROM
- I2C serial port
- Sinusoidal modulation for reduced audible noise and low vibration
- Sensorless (no Hall sensors required)
- Trapezoidal drive option for high speed
- Adjustable gate drive option
- Minimal external components
- PWM duty cycle speed input
- FG speed output
- Lock detection
- Soft start
- Shorted output protection (overcurrent protection, OCP)

### APPLICATIONS

- High-speed 12 V server cooling fans
- Industrial and consumer blowers and fans

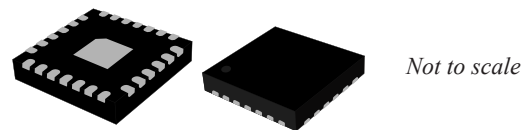
### DESCRIPTION

The A89332 three-phase motor controller incorporates a sensorless sinusoidal drive to minimize vibration for high-power, high-speed server fans. Sensorless control eliminates the requirement for Hall sensors for server fan applications.

A flexible, closed-loop speed control system is integrated into the IC. An EEPROM is used to tailor the common functions of the fan speed curve to a specific application. This eliminates the requirement for a microprocessor-based system and minimizes programming requirements.

The A89332 is available in a 4 × 4 QFN with exposed power pad (suffix EX).

### PACKAGE:



26-Contact QFN with exposed pad (EX package)

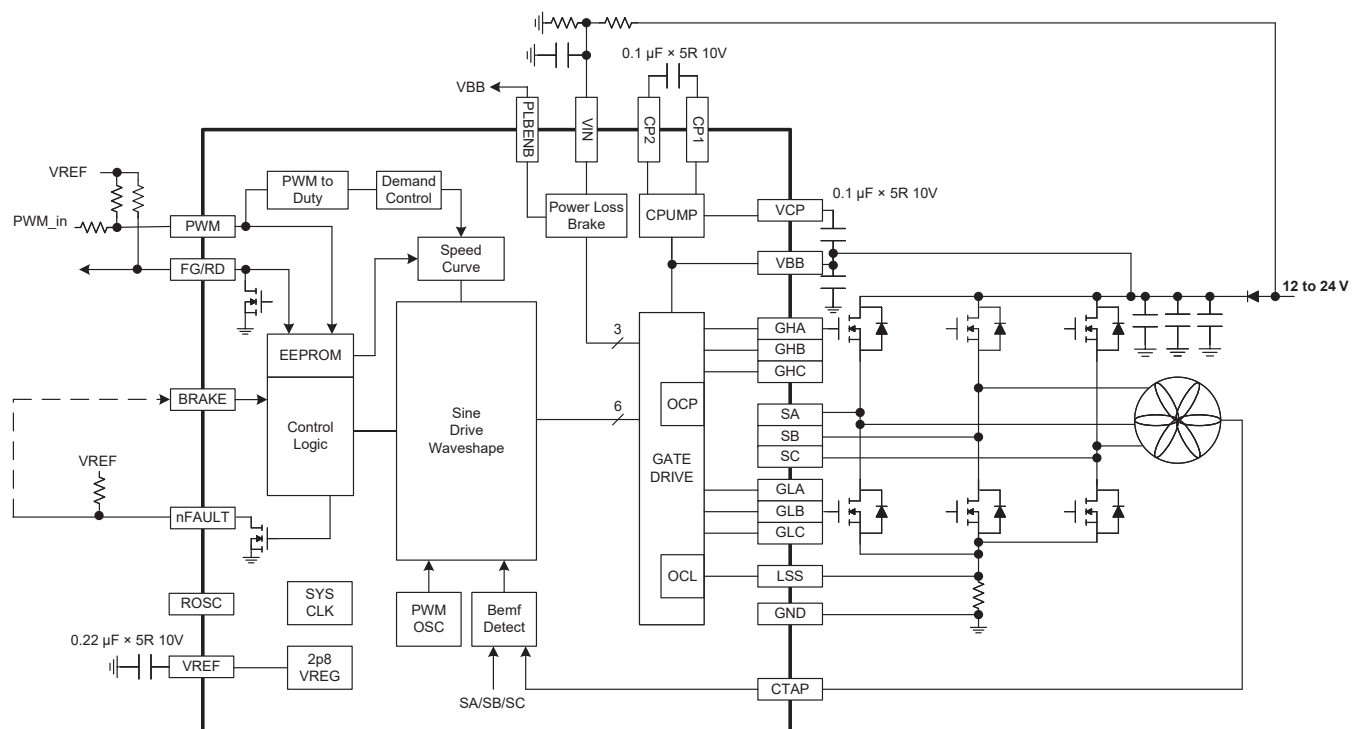


Figure 1: Typical Application

## SPECIFICATIONS

## SELECTION GUIDE

Part Number	Package	Packing
A89332GEXSR	4 × 4 QFN with exposed thermal pad	6000 pieces per 13-inch reel



## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Rating	Units
Supply Voltage	$V_{BB}$		-0.3 to 36	V
Control Input	$V_i$	VIN, PLBENB	-0.3 to 36	V
Logic Input Voltage Range (PWM, nBRAKE)	$V_i$		-0.3 to 6	V
Logic Output—FG/RD,nFLT	$V_O$	FG/RD ( $I < 5$ mA)	18	V
LSS	$V_{LSS}$	DC	-500 to 500	mV
		$t_W < 500$ ns	-4 to 4	V
Output Voltage	$V_{OUT}$	SA, SB, SC	-2 to $V_{BB} + 2$	V
CTAP	$V_{CTAP}$	DC	-0.6 to $V_{BB} + 0.6$	V
		$t_W < 500$ ns	-0.2 to $V_{BB} + 2$	V
GHx	$V_{GH}$		$V_{SX} - 0.3$ to $V_{CP} + 0.3$	V
GLx	$V_{GL}$		$V_{LSS} - 0.3$ to 8.5	V
VCP	$V_{VCP}$		$V_{BB} - 0.3$ to $V_{BB} + 8$	V
Junction Temperature	$T_J$		150	°C
Storage Temperature Range	$T_S$		-55 to 150	°C
Operating Temperature Range	$T_A$		-40 to 105	°C

## THERMAL CHARACTERISTICS: May require derating at maximum conditions; see application information.

Characteristic	Symbol	Test Conditions*	Value	Unit
Package Thermal Resistance	$R_{\theta JA}$	Package EX, on 2-sided PCB with 1 in <sup>2</sup> copper	55	°C/W

\*Additional thermal information is available on the Allegro website.