

# MOTOR POSITION AND ANGLE SENSING

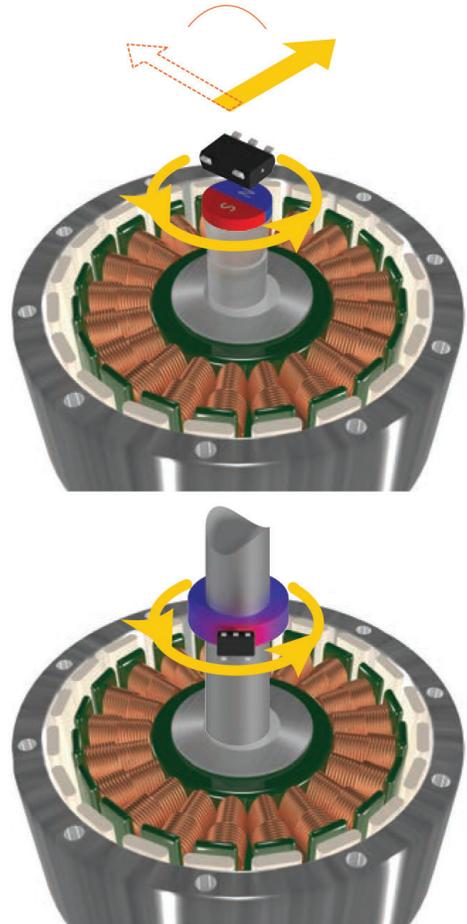
## The World's Smallest 3D Sine/Cosine Sensor

The Allegro A33230 Hall-effect position and angle sensor IC is the smallest 3D Sine/Cosine sensor currently available in the market. Ideal for high-speed low-latency motor position applications, including brushless DC motors, the A33230 is also an excellent choice for AC synchronous permanent-magnet and asynchronous inductive motors for automotive and industrial applications such as personal mobility, factory robotics, windshield wipers, and in-cabin motors.

*Superior high-speed performance, versatility, and design flexibility for simplifying BOMs in space-limited PCBs:* The A33230 has integrated vertical and planar Hall-effect elements with sensing axes orthogonal to one another, providing 90 degrees of phase separation independent of magnet pole spacing and air gap. Two discrete analog signal paths provide independent sine and cosine outputs.

*Easy to operate:* The A33230 is pre-configured to measure the angle in any plane—XY, XZ, or YZ—and can be used as an angle sensor with systems that include an electronic control unit (ECU) capable of performing CORDIC calculations on both analog outputs.

*Easy to integrate:* Designed to complement our existing portfolio of digital angle sensors, the A33230 offers system designers a reliable, cost-effective choice in position and angle sensors. This solution is ready-made for legacy applications and for systems configured to receive sine and cosine sensor outputs. It's offered in a 5-pin SOT23-W package (suffix LH) that is RoHS-compliant and lead (Pb) free, with a 100% matte tin leadframe plating.

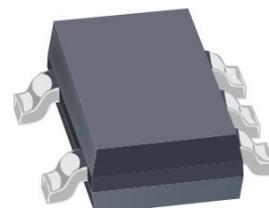


### Extreme Versatility

End-of-shaft angle measurement (top)  
and side-shaft angle measurement (bottom)

### Features

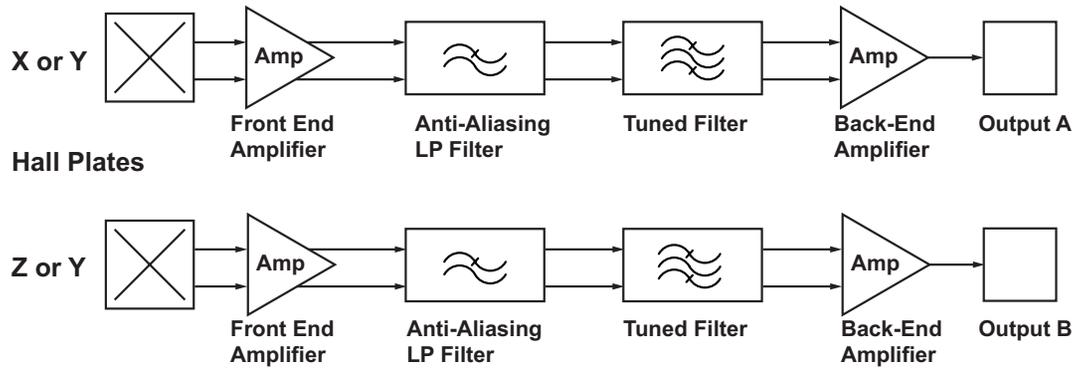
- Smallest package available (SOT 23-W)
- 3D sensing capable
- Fast response/low latency
- Sine cosine outputs
- Simple and flexible
- Two sensitivity options



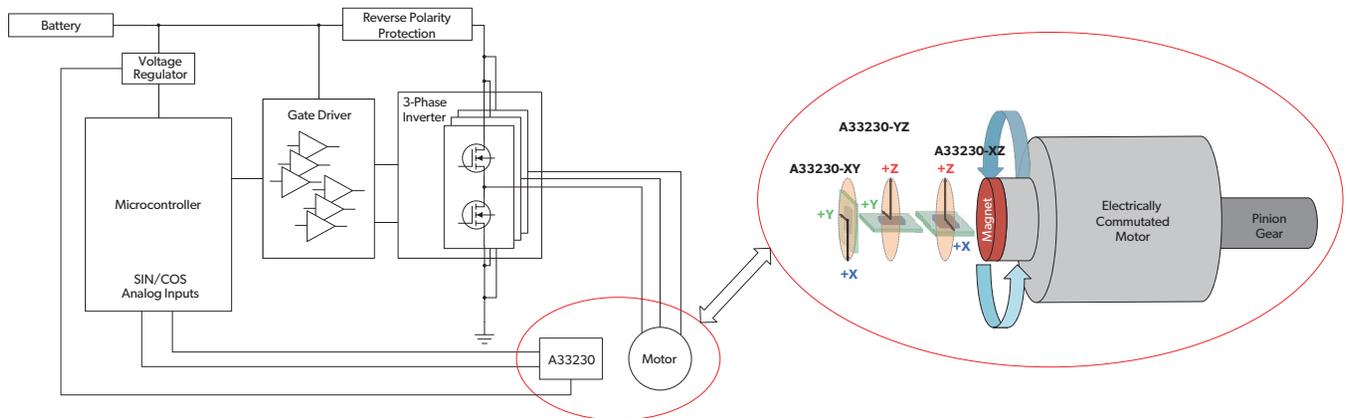
**5-Pin SOT23-W**  
(Suffix LH-5) Package  
*Not to scale*

# Allegro A33230: The World's Smallest 3D Sine/Cosine Sensor

## Functional Block Diagram



## Application Diagram



## Applications

- Brushless DC (BLDC) motor position sensing
- AC synchronous permanent magnet motors
- Synchronous inductive motors
- E-bikes
- Cooling pumps
- Electronic power braking
- Integrated belt starter generators
- Oil pumps
- Fuel pumps