

# 3DMAG™: ALL ANGLES COVERED

Highly Accurate, Versatile Position Sensing Solutions

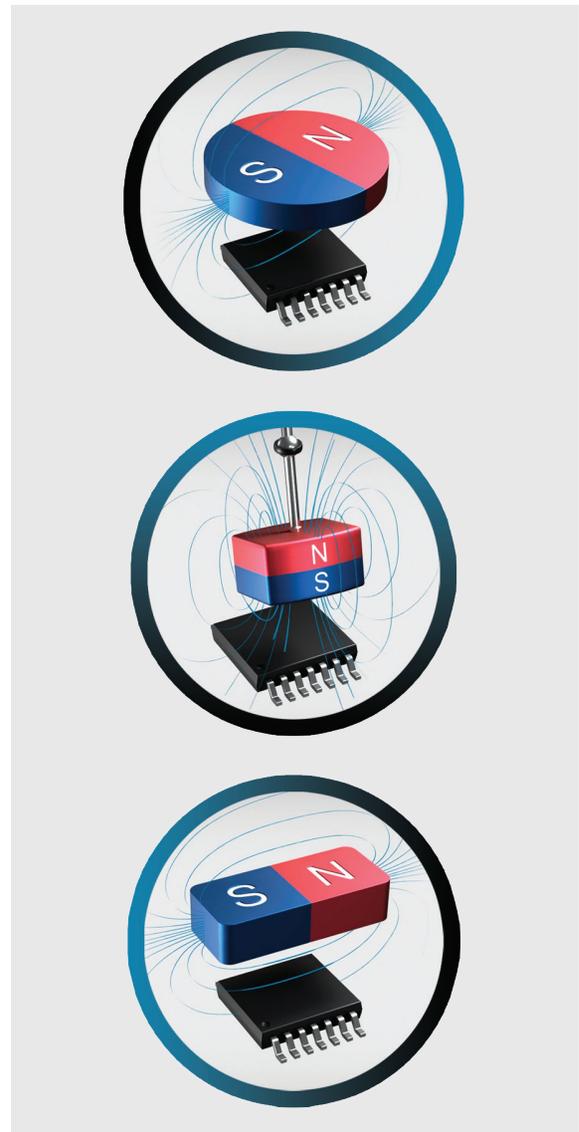
**With more than 25 years of leadership in magnetic position sensors, Allegro is paving the way for the innovations of tomorrow—today.**

Combining our proven planar and vertical hall technologies, [3DMAG™ solutions](#) offer robust, high-performing, three-axis magnetic field measurements in a single IC. Enabling a wide range of contactless motion detection, 3DMAG sensors are reliable, easy to integrate, and offer unparalleled design flexibility.

Emerging trends such as automated driving, vehicle electrification, and Industry 4.0 are creating new packaging, performance, and power constraints. Our highly versatile 3DMAG sensors ease system integration while making it possible to achieve stringent accuracy requirements. A wide range of programmable channel trim and linearization options can easily be adjusted to the magnetic circuitry, allowing designers to optimize for both accuracy and manufacturing efficiency in end-of-line programming times for specific applications. 3DMAG sensors also offer low power consumption and flexible power management options, enabling battery life optimization in portable applications.

Supporting flexible low-voltage programming through sensor outputs regardless of the interface, 3DMAG position sensors allow direct programming by a microcontroller in embedded designs and simplify the interface for end-of-line system calibration. This low-voltage programming option also opens up new system architectures with remote field-replaceable sensor module designs that can be programmed by the electronic control unit (ECU).

**With Allegro 3DMAG sensors, you have all angles covered.**



## Features

- Wide range of contactless position sensing including:
  - On-axis and off-axis rotary (up to 360°)
  - Linear stroke / slide-by linear
  - Complex 3D motion and joystick position
- Flexible architecture and signal processing for easy system integration and performance optimization
- Low-voltage, in-application EEPROM programming for all interface options (analog, SENT, PWM, I<sup>2</sup>C)
- Adherence to ISO 26262 for safety-critical applications
- Automotive Q-100 qualified (ALS31313, A31315, A31316)
- Small-footprint, cost-effective solutions

# Unparalleled Design Flexibility For Your Position Sensing Applications

## Typical Applications

### Automotive

- Advanced driver assistance systems (ADAS)
  - Steering angle sensor
  - Braking systems
- Battery thermal management for electric vehicles
- Conventional powertrain systems
  - Throttle and valve position
  - Transmission and variable valve actuator sensors
- Safety, comfort, and convenience
  - Pedal (accelerator, brake, clutch)
  - Shifter (PRNDL) position
  - Steering column controls and human machine interfaces

### Industrial

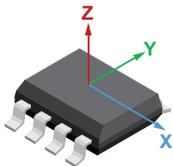
- Robotics and industrial cranes
- Joysticks and valve positioning
- Agricultural equipment
- Recreational vehicles and two-wheelers
- Home and building automation

### Consumer and Commercial

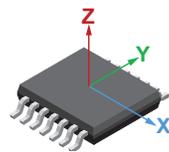
- Gaming and virtual reality controllers
- Camera gimbals
- Robotics
- Drones and unmanned aerial vehicles (UAVs)

## Packages

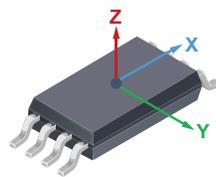
Single-Die SOIC-8  
(OL suffix)



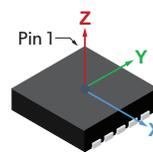
Dual-Die TSSOP-14  
(LU suffix)



8-Pin TSSOP  
(LE suffix)



10-Pin DFN  
(EJ suffix)



PCB-less SIP  
(UC suffix)



Not to scale

## 3D POSITION SENSOR ICs

Motion Detection					Market		
Part Number	On-Axis Rotary	Off-Axis Rotary	Linear Stroke	3D / Joystick	Industrial & Consumer	Automotive (AEC-Q100)	Functional Safety - ASIL (ISO 26262)
<a href="#">ALS31300</a>	X	X	X	X	X		-
<a href="#">ALS31313</a>	X	X	X	X	X	X	-
<a href="#">A31315</a>	X	X	X		X	X	B (single die) D (dual die)
<a href="#">A31316</a>	X	X	X		X	X	B (single die)
Part Number	Output Format	On-Chip Angle Calculation & Linearization	Active Magnetic Axes	Max Magnetic Field (G)	Supply Voltage (V)	Temperature Range	Package
ALS31300	I <sup>2</sup> C		3 Axes (X,Y,Z)	500, 1000, 2000	2.65 to 3.5	-40 to 85°C	3 × 3 mm DFN-10
ALS31313	I <sup>2</sup> C		3 Axes (X,Y,Z)	500, 1000, 2000	2.65 to 3.5	-40 to 125°C	TSSOP-8
A31315	Analog, SENT, PWM	X	2 Axes (XY, XZ, or YZ)	1000	4.5 to 5.5	-40 to 150°C	SOIC-8 (single die), TSSOP-14 (dual die)
A31316	SENT, PWM	X	2 Axes (XY, XZ, or YZ)	1000	4.5 to 5.5	-40 to 150°C	PCB-less SIP

To learn more about the Allegro 3DMAG family of products and to explore available design resources, visit [allegromicro.com/3DMAG](http://allegromicro.com/3DMAG).