

## NXP magnetoresistive sensors KMZ49, X3G-OH04x & X3T-OH04x

# Precise angular measurements with AMR sensors in SO8 or bare die

These advanced sensors help realize the future of green cars. They help reduce emissions, increase vehicle stability, and add driver-independent control functions.

### Key features

- ▶ Accurate and reliable angle measurement
- ▶ Mechanical robustness, with contactless principle
- ▶ Wear-free operation
- ▶ Accuracy independent of mechanical tolerances
- ▶ Extended temperature range up to 150 °C
- ▶ Automotive qualification according AEC-Q101
- ▶ Reflow capable due to MSL1

### Key benefits

- ▶ Steering angle and torsion
- ▶ Headlight adjustment
- ▶ Motor positioning
- ▶ Window wipers
- ▶ Fuel level
- ▶ Mirror positioning
- ▶ General angle measurement

Available in an SO8 package or as bare die, these high-performance anisotropic sensors help designers of automotive and industrial applications enhance performance while increasing efficiency, and thereby support the worldwide commitment to reduce CO<sub>2</sub> emissions.

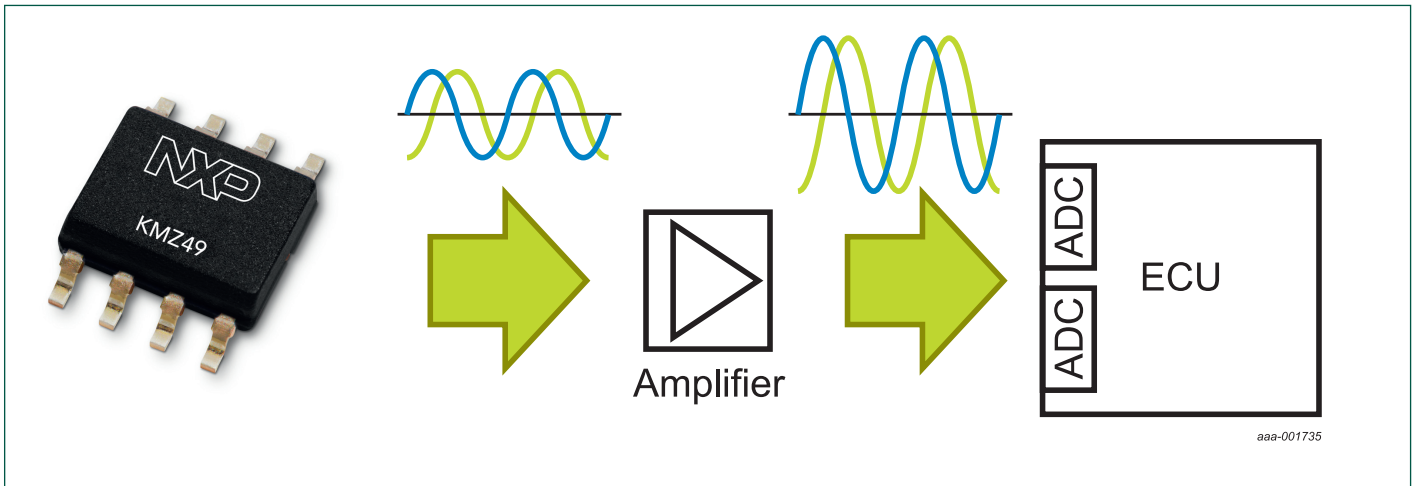
The KMZ49 is available in a space-saving SO8 package, while the X3G-OH048, X3T-OH048, X3G-OH047, and X3T-OH047 are available as bare-die solutions. The KMZ49, X3G-OH048, and X3T-OH048 each contain eight AMR resistors, connected as two individual Wheatstone bridges aligned at 45°. The X3G-OH047 and X3T-OH047 double this configuration, with two single-die AMR arrangements each.

All of the sensors employ the magnetoresistive effect of thin-film permalloy. A rotating magnetic field in the surface parallel to the chip (x-y plane) delivers two independent sinusoidal output signals, one following a  $\cos(2\alpha)$  function and the other following a  $\sin(2\alpha)$  function, where  $\alpha$  is the angle between the sensor and the field direction.

Accurate, reliable performance make all of these sensors suited for applications that require high-precision angle measurements under low field conditions (saturation field strength 25 kA/m).



## KMZ49 block diagram



## Operating characteristics for KMZ49 and bare-die solutions\*

Parameter	Value
Maximum supply voltage	9 V
Number of outputs	4x analog (differential)
Operating temperature	-40 °C to +150 °C
Maximum offset voltage	± 2 mV/V
Maximum offset voltage temperature coefficient	± 2 $\mu$ V/V/K
Typical angular inaccuracy	0.05°
Maximum angular inaccuracy	0.1°

\*Values subject to change

## Order information for bare-die solutions

Order number	Die type	Format
X3G-OH047	Double	Sawn wafer on foil
X3G-OH048	Single	Sawn wafer on foil
X3T-OH047	Double	Taped on reel
X3T-OH048	Single	Taped on reel

## KMZ49 assembly example

