

## Magnetic Sensors

# TDK introduces small redundant analog TMR angle-sensor for safety relevant applications

- TAS4240 is a compact, cost-effective, redundant, half-bridge TMR-based sensor for angle and position detection
- High stability over temperature, magnetic-field range, and lifetime
- Provides accurate and redundant rotor position measurement needed in safety-relevant applications like power steering motors

July 14, 2022

TDK Corporation (TSE:6762) expands its tunnel-magnetoresistance (TMR) angle sensor portfolio with the launch of the TAS4240 TMR-based angle-sensor for automotive and industrial applications. The TAS4240 comes in a compact TSSOP8 package and provides two redundant analog single-ended SIN/COS outputs. The sensor enables precise angle measurements in applications where high performance is needed and space is limited. Samples of the TAS4240 are available now and production started in April 2022.

As a 360° angle sensor, TAS4240 is suited to accurately measure the rotor position of BLDC motors used in safety critical applications, like power steering, brake boosters, or traction motors.\* The sensor contains four TMR half bridges and provides two separated SIN/COS outputs. Higher safety levels up to ASIL D can then be achieved for the system while offering higher availability of position information even in case of a failure of one of the output signals. Depending on system architectures, fail-operational concepts can also be supported by the sensor.

TDK's state-of-the-art TMR technology benefits from its long-term expertise in magnetic-sensor technology and optimizes its sensors by successfully integrating sophisticated TMR technology into small packages. The angle accuracy of the sensor remains stable at different temperatures and over the sensor's lifetime. The deterministic behavior of the TAS4240 in extended magnetic-field ranges opens up new application possibilities, even in demanding environments.

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## Glossary

- TMR: Tunnel Magneto-Resistance

## Main applications\*

- Brushless DC (BLDC) and permanent-magnet synchronous motor (PMSM) commutation in a safety relevant environment (Electronic Power Steering, Brake booster, etc.)
- Linear position sensing using an array of TAS4240 sensors
- Industrial servo motors, automation, encoders, robotics

## Main features and benefits\*\*

- Contactless 360° angle measurement
- High angle accuracy of  $\pm 1.0^\circ$  in an ambient temperature range of  $-40^\circ\text{C}$  to  $+150^\circ\text{C}$
- Redundancy: 2x single-ended output
- Low power consumption
- Supports radial sensing concepts
- Optimized for automotive (AEC-Q100) and industrial applications

Key data	
Type	TAS4240
Package type	TSSOP8
Package dimensions	3 mm x 6.4 mm x 1.1 mm
Angle accuracy	$\pm 1.0$ degrees or less (over temperature) $\pm 0.3$ degrees ( $T_A = 25^\circ\text{C}$ , typical)
Temperature range	$-40^\circ\text{C}$ up to $+150^\circ\text{C}$ (ambient)
Analog output	Single-ended, redundant, 1.5 Vp-p (at $V_{CC} 5.0\text{ V}$ , Ratiometric)
Bridge resistance	5 k $\Omega$
Magnetic-field measuring range	20 to 80 mT (recommended)
Sample availability	available

\* Any mention of target applications for our products are made without a claim for fit for purpose, as this has to be checked at system level.

\*\* All operating parameters must be validated for each customer application by customers' technical experts.

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## About TDK Corporation

TDK Corporation is a world leader in electronic solutions for the smart society based in Tokyo, Japan. Built on a foundation of material sciences mastery, TDK welcomes societal transformation by resolutely remaining at the forefront of technological evolution and deliberately “Attracting Tomorrow.” It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK’s comprehensive, innovation-driven portfolio features passive components such as ceramic, aluminum electrolytic and film capacitors, as well as magnetics, high-frequency, and piezo and protection devices. The product spectrum also includes sensors and sensor systems such as temperature and pressure, magnetic, and MEMS sensors. In addition, TDK provides power supplies and energy devices, magnetic heads and more. These products are marketed under the product brands TDK, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK focuses on demanding markets in automotive, industrial and consumer electronics, and information and communication technology. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2022, TDK posted total sales of USD 15.6 billion and employed about 117,000 people worldwide.

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