

Magnetic sensors

Joint development of high accuracy TMR 3-axis magnetometer with Asahi Kasei Microdevices

- Combines TDK's high accuracy TMR element with Asahi Kasei Microdevices' advanced electronic compass ASIC
- High sensitivity of 10 nT/LSB
- Industry's lowest RMS noise of just 40 nT-rms

January 9, 2018

TDK Corporation and Asahi Kasei Microdevices Corporation (AKM) have jointly developed a highly accurate 3-axis magnetometer that combines an extremely sensitive tunnel magneto-resistive (TMR) element developed by TDK and an advanced electronic compass ASIC designed by AKM in a very small package. The new TMR magnetometer on a chip, which has miniature dimensions of just 1.6 mm x 1.6 mm x 0.6 mm, features the industry's lowest RMS noise of just 40 nT-rms and a very low current consumption of only 40 μ A at an output data rate of 100 Hz.

Thanks to its high sensitivity of 10 nT/LSB*, the magnetic sensor can detect minute changes in magnetic fields very precisely, enabling the highly accurate detection of both position and orientation with the help of the Earth's magnetic field or a magnetic field generator. These unique characteristics make the TMR magnetometer ideal for compact electronic devices such as smartphones, tablets, game console controllers and all kinds of wearable devices, as well as other applications that demand high position and orientation precision such as virtual, augmented or mixed reality (VR, AR, and MR) or indoor navigation. The new 3-axis magnetic sensor is also suitable for integration into IoT devices, for which strong market growth is expected.

The new sensor will be on display at the booths of both TDK and AKM at the Consumer Electronics Show 2018 (CES 2018), the world's largest electronics exhibition, which will take place in Las Vegas, USA, from January 9 to 12, 2018.

* Least Significant Bit

Glossary

- TMR: Tunnel magneto resistance. Of all magnetic field sensors, this offers the greatest sensitivity

Main applications

- Compact electronic devices such as smartphones, tablets and game console controllers
- All kinds of wearable devices or IoT devices
- Applications that demand high position and orientation precision such as virtual, augmented or mixed reality (VR, AR, and MR) or indoor navigation

Main features and benefits

- High sensitivity of 10 nT/LSB
- Industry's lowest RMS noise of just 40 nT-rms
- Very low current consumption of only 40 μ A at an output data rate of 100 Hz
- Miniature dimensions of just 1.6 mm x 1.6 mm x 0.6 mm

Key data

Measurement range	[μ T]	\pm 1200
Sensitivity	[nT/LSB]	10
RMS noise (typ.)	[nT-rms]	40
Output bit	[bits]	18
Current consumption @ ODR of 100 Hz	[μ A]	40
Dimensions	[mm]	1.6 x 1.6 x 0.6

New product introduction

Exhibition Consumer Electronics Show 2018 (CES 2018)
 Venue Las Vegas Convention & World Trade Center (LVCC)
 Dates January 9 to 12, 2018
 Location TDK: Booth 30325, LVCC
 AKM: Venetian Suites 30-209, 30-211; Invitation only
 To request an appointment please visit: www.akmsj.com

About Asahi Kasei Microdevices Corporation

Asahi Kasei Microdevices Corporation (AKM*), a group company of Asahi Kasei Corporation, is a Japan-based company which has continued to provide customers with optimum solutions all over the world for over 30 years by offering a variety of advanced sensing devices based on compound semiconductor technology and sophisticated IC products featuring analog/digital mixed-signal technology.

* AKM is a trademark of Asahi Kasei Microdevices Corporation in Japan, Europe and the United States.

About TDK Corporation

TDK Corporation is a leading electronics company based in Tokyo, Japan. It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's portfolio includes passive components, such as ceramic, aluminum electrolytic and film capacitors, ferrites and inductors, high-frequency products, and piezo and protection components, as well as sensors and sensor systems and power supplies. These products are marketed under the product brands TDK, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK's further main product groups include magnetic application products, energy devices, and flash memory application devices. TDK focuses on demanding markets in the areas of information and communication technology and automotive, industrial and consumer electronics. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2017, TDK posted total sales of USD 10.5 billion and employed about 100,000 people worldwide.

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