

Magnetic Sensors

New entry-level linear Hall-effect sensor with SENT output

- Value-optimized programmable linear Hall-effect sensor with SENT output according to SAE J2716 Rev. 4
- Offers signal path supervision
- AEC-Q100 qualified for use in automotive and industrial applications

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TDK Corporation (TSE 6762) expands its Micronas linear Hall-effect sensor portfolio with the programmable HAL 1890 supporting the latest SENT protocol according to SAE J2716 Rev. 4. The HAL 1890 now comes with digital output signal supervision and is as small, robust, and cost-effective as the already existing HAL 188x variants. The HAL 1890 is an optimal system solution to measure small angles of up to 90° or linear displacements of a few millimeters in harsh environments. For example, it may be used as a gear position detection sensor in dual-clutch automatic transmission or as a steering torque sensor for industrial or recreational vehicles. Samples are available as of now. Start of production is planned for the second half of 2019.

The sensor supports various SENT data frame formats (H.2 and H.4) as well as error signal transmission on Fast and Slow channels. Several programmable output signal clamping levels extend the error signaling capabilities to indicate various fault conditions, such as under/overvoltage, under/overflow of the signal path, and overcurrent. The signal path of the HAL 1890 enables flexibility via external programming: major characteristics, like magnetic-field range, sensitivity, offset, and temperature coefficients, are programmable in non-volatile memory. A one-pin programming interface enables simultaneous programming of several sensors via their output pins. The HAL 1890 generates an accurate and customized output from a magnetic input signal and provides 10-bit output resolution supporting a maximum bandwidth of 5 kHz.

“The HAL 1890 retains the advantages of its predecessors in stringent application environments thanks to its protection functions and diagnostic capabilities. Additionally, it profits from the latest SENT protocol by transmitting not only sensor data and error codes but also other parameters, including sensor ID, magnetic range, sensitivity, and offset. Customers looking to secure and enhance their data transmission can benefit significantly from the feature set of the HAL 1890 at this price level”, says Matthieu Rezé, Product Marketing Manager Magnetic Sensors at TDK-Micronas.

The HAL 1890 is qualified according to AEC-Q100 and is housed in an industry standard 3-pin TO92-UA package, lead free, with matte tin lead frame plating. It comes with two pin configurations: an in-line version with 1.27 mm pin-to-pin spacing or, alternatively, a spread-pin version with 2.54 mm pin-to-pin spacing, which is better suited for welding.

Glossary

- SENT = Single Edge Nibble Transmission

Main applications

- Detection of small angles of rotation in automotive applications, e.g., rotary shifters
- Detection of linear position in automotive applications, e.g., gear position sensing

Main features and benefits

- SENT output according to SAE J2716 Rev. 4
- Support of 3 and 6 data nibbles with secure information frame format (H.2 and H.4)
- Enhanced 8-bit ID serial message format
- Selectable clamping levels with selectable diagnosis
- Comprehensive diagnostic feature set
- Programming via output pin or supply voltage modulation
- Operates with static and dynamic magnetic fields of up to 5 kHz

Key data

Type	HAL 1890
Package	TO92-UA
Digital output formats	SENT output according to SAE J2716 Rev. 4
Magnetic-field measurement range	40 mT to 160 mT
Accuracy	10 bit
Junction temperature	-40 °C to 170 °C
Sample availability	March 2019

About TDK-Micronas

TDK-Micronas is the most preferred partner for sensing and control. TDK-Micronas serves all major automotive electronics customers worldwide, many of them in long-term partnerships for lasting success. Operational headquarters are based in Freiburg im Breisgau (Germany). Currently, TDK-Micronas employs around 1000 persons. For more information about TDK-Micronas and its products, please visit www.micronas.com.

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 comprehensive 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 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 2018, TDK posted total sales of USD 12 billion and employed about 103,000 people worldwide.

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