

**Press Information No. 1407\_E**

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## **Advanced 3D HAL<sup>®</sup> technology powers Micronas' new sensor generation leading to superior angular accuracy**

**Micronas presents the robust direct angle sensor family HAL 37xy offering outstanding temperature stability, high resistance against air gap variations and magnet aging together with a wide-range of diagnostic functions and very effective protection circuitry**

**Freiburg, May 19, 2014** – Micronas (SIX Swiss Exchange: MASN), known and recognized in the automotive and industrial business as a global partner for intelligent, sensor-based system solutions, today announces the second generation of its direct angle sensor family. The new HAL 37xy family consists of two members, the HAL 372x featuring a ratiometric analog output and the HAL 373x with PWM and SENT output according SAE-J2716 release 2010.

The sensors are well suited for angle measurement, as well as linear position detection in automotive and industrial environments, supporting a junction temperature range from –40 °C to 170 °C. Due to their excellent performance, they can be employed for instance in clutch position detection in gearboxes or in ride-height applications. Further suitable applications are motor air management, such as EGR (Exhaust Gas Recirculation) or throttle position or turbo charger actuators. In the industrial area, the devices can be used in various applications e.g. in joysticks or as valve position sensor for automation control.

Other typical applications are angle measurements up to 360 °, as well as any type of position detection with reduced magnet sizes or the wear-free replacement of conventional potentiometers. Using a magnet with a length of 10 mm, distances of more than 15 mm can be easily achieved. An overall movement of up to 40 mm can be detected with simple magnetic setups.

The HAL 37xy family is manufactured in the latest CMOS technology from Micronas using further enhanced vertical Hall plates. Thanks to the improved Hall plate performance, the overall angular error could be reduced by 30 percent compared to the first technology generation used in HAL 36xy / 38xy family\*. By this reduction, position detection can be performed with a very high absolute overall accuracy of 1.5 degrees. This makes the HAL 37xy family the most accurate angle sensor solutions on the market using vertical Hall plate technology.

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“Thanks to the second generation of Micronas’ 3D HAL technology, our direct angle sensor family offers decisive advantages compared to all currently available Hall and all other magnetic based sensor technologies and thus further strengthens our leading market position”, says Dirk Behrens, Vice President Automotive at Micronas.

The HAL 37xy family uses a so-called pixel cell, which consists of two vertical (BX, BY) and one horizontal Hall plate (BZ). With this pixel cell it is possible to measure the three magnetic field vector components at one spot. Magnetic field lines in parallel to the sensor surface are detected by the vertical Hall plates, whereas the component perpendicular to the chip surface is captured by the horizontal Hall plate. The ability to measure the relative strength of both components is the key for excellent angular performance.

The sensors are housed in a small SOIC8 SMD or 4-pin leaded TO92UP package and are qualified according to AEC-Q 100. With the SMD package version, the application can be perfectly adjusted to all mechanical positioning requirements and cost-saving production processes. When a leadframe design is preferred, the TO92UP package perfectly fits for assembly.

For storing the calibration parameters, the sensor is equipped with a high-temperature resistant non-volatile memory. Internal digital signal processing algorithms in combination with the integrated EEPROM enable customization and robust calibration for compensating application-specific impairments. 33 setpoints with 16 bit accuracy help to further reduce errors caused by the system setup, especially for linear position detection applications. Easy-to-use LabVIEW™-based software and high-quality application notes accelerate development, even for novice magnet system designers.

All derivatives have an extended feature set for detecting and identifying potential sources of errors. The broad range of diagnostic functions includes the detection and the signaling of wiring problems, the localization of short circuits at the output stage, as well as various internal self-tests of the complete sensor signal path and the memory environment. All members of the HAL 37xy family meet the stringent EMC requirements of the automotive industry and offer a very high ESD protection.

The sensors can be programmed directly via a bidirectional output pin by varying the output voltage without the need for a separate programming pin.

Production start is scheduled for the fourth quarter of 2014. For product documentation, IC samples, and programming boards please contact Micronas’ sales offices or one of its distribution partners listed on [www.micronas.com/sales](http://www.micronas.com/sales).

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**About Micronas**

Micronas (SIX Swiss Exchange: MASN) is known and recognized in the automotive and industrial business as a reliable global partner for intelligent, sensor-based system solutions. Micronas offers a variety of Hall sensors and embedded controllers for smart actuators for automotive and industrial applications, such as drivetrains, chassis frames, engine management and convenience functions.

Micronas serves all major automotive electronics customers worldwide, many of them in long-term partnerships for lasting success. While the holding company is headquartered in Zurich (Switzerland), operational headquarters are based in Freiburg (Germany). Currently, the Micronas Group employs around 900 persons. For more information about Micronas and its products, please visit [www.micronas.com](http://www.micronas.com).

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