

ams to boost automotive electrification with launch of first inductive position sensor for high-speed motors

Innovative AS5715 sensor IC provides cost, size and weight savings compared to the resolvers in common use in vehicles today

Premstaetten, Austria (December 17, 2019) -- ams (SIX: AMS), a leading worldwide supplier of high performance sensor solutions, has today introduced the first inductive position sensor for high-speed, automotive and industrial electric motors to be available as a standard product on the open market.

New rotor position sensing solutions based on the AS5715 can match the accuracy and latency of resolvers widely used in high-speed motor applications, while providing substantial savings in bill-of-materials cost, size and weight. Importantly, it is also ISO 26262 functional safety standard compliant as the IC is based on an ASIL-C implementation and the redundant implementation supports ASIL-D.

The commercialization by ams of inductive position sensor semiconductor technology marks an important advance in the drive to electrify automotive systems such as power steering, as well as the traction systems in electric and hybrid electric vehicles. The AS5715 inductive sensor is highly configurable, and can be used in on-axis (end-of-shaft) and off-axis (through shaft or side-of-shaft) topologies, and with many types of multi-pole-pair motor.

Chris Feige, Executive Vice President for Automotive Solutions at ams, says, "With the launch of the AS5715, ams takes another big step forward in its mission to provide technology for the greener, safer, smarter and more comfortable vehicle of tomorrow. Motors built with the AS5715 will be smaller and lighter, and deliver a smoother, more powerful output. This, coupled with cost savings are perfect reasons for automotive manufacturers to replace expensive, cumbersome resolvers with the AS5715 inductive sensor."

Driving the motor market

The AS5715's breakthrough in performance, size and cost is set to disrupt a fast-growing market. The overall market for electric motors (including traction motors) is forecast to grow at 8.3% compound annual growth rate (CAGR) by value, reaching an estimated \$34.6 billion in 2021 [1].

Meanwhile, the automotive electric motor market is changing, with the permanent magnet synchronous motor (PMSM) supplanting the brushless DC motor in many high-speed applications.

At the same time, new government regulations worldwide are tightening the requirements on the car industry to cut average fuel consumption across their fleets in response to the climate crisis. By replacing legacy electro-mechanical and hydraulic automotive systems with efficient electronically controlled motors, car manufacturers can reach their fuel consumption targets more quickly.

The highly accurate, low-latency position measurements produced by the AS5715 underpin the operation of electric motor-control systems, enabling high-speed motors to maximize torque, limit

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torque ripple, and achieve high efficiency. A position sensor system based on an AS5715 IC and its associated coil printed on a simple, low-cost PCB can achieve accuracy up to $\pm 0.3^\circ$ at rotation speeds up to 100,000rpm in various motor types including four-pole-pair PMSMs.

Easy-to-use measurement outputs

Developers who have worked previously with resolvers will find they are familiar with the mode of operation of the AS5715. It provides two pairs of differential analog outputs, as sine waves and co-sine waves. These may be resolved to an angle measurement by applying an arctan function in the host controller.

Comprehensive documentation and applications guidance from ams shows how to design the Tx and Rx coils in the static sensor PCB, and the rotating target assembly affixed to the rotor.

The AS5715 also supports automotive manufacturers' programmes for compliance with the ISO 26262 functional safety standard. A fully redundant measurement system can be implemented by mounting two AS5715 ICs on the sensor board.

The AS5715 is available for sampling now. An evaluation kit for the AS5715 inductive position sensor is available on request from ams. For sample requests and for more technical information, go to <https://ams.com/as5715>.

¹ IHS Electric motors in automotive applications – 2017

About ams

ams is a global leader in the design and manufacture of advanced sensor solutions. Our mission is to shape the world with sensor solutions by providing a seamless interface between humans and technology.

ams' high-performance sensor solutions drive applications requiring small form factor, low power, highest sensitivity and multi-sensor integration. Products include sensor solutions, sensor ICs, interfaces and related software for consumer, communications, industrial, medical, and automotive markets.

With headquarters in Austria, ams employs about 9,000 people globally and serves more than 8,000 customers worldwide. ams is listed on the SIX Swiss stock exchange (ticker symbol: AMS). More information about ams can be found at ams.com

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