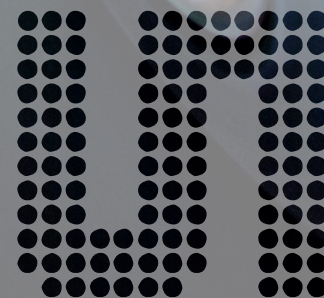


# Inductive High Speed Motor Control

[ams.com/AS5715R](http://ams.com/AS5715R)



## Inductive High Speed Angle Position Sensing for Automotive Applications

- High speed measurement up to 480,000 rpm
- Flexible system configuration and application form factors
- Easy adaption to any application – all pole-pair counts with constant resolution
- Robustness against magnetic stray fields

**Sensing  
is life.**

## General Description

The ams IC features high speed angle position sensing based on inductive sensing technology. The device is combined with a customized coil system based on an inductive technology. The device is combined with a customized coil system which consists of a target, TX (transmitting) and two RX (receiving) coils integrated on a PCB. The device excites the TX coil with a high frequency voltage. The target above the coils effects the voltage, induced into the RX coils depending on the position of

the target. The device measures, demodulates, and amplifies this voltage. The output is a SIN and COS shaped voltage which is proportional to the position of the target. By applying an atan2 (2-argument arctangent) calculation to the output signals with SIN and COS as arguments, an accurate angle is calculated. The product is defined as SEooC (Safety Element out of Context) according ISO26262.

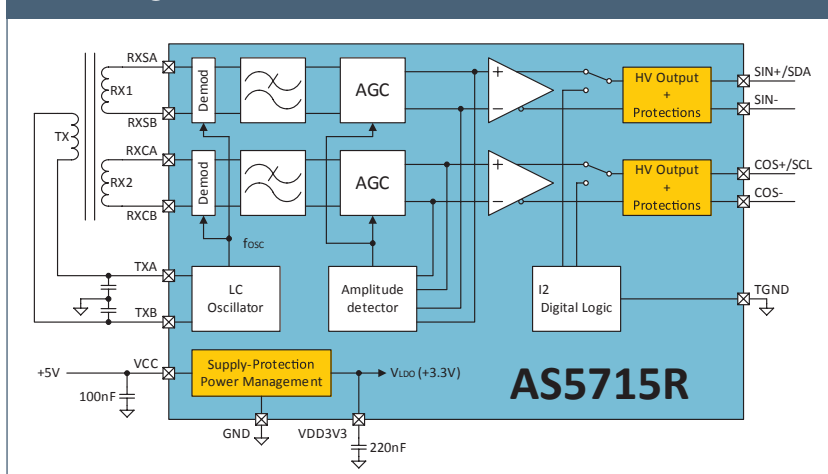
### Features

- On and off axis applications
- Adaptable coil system layout
- Typical accuracy with 4 pole-pair configuration: <math><0.075\text{ deg mechanical}</math>, <math><0.3\text{ deg electrical}</math>
- Suitable for high speed applications
- Differential SIN and COS output
- Functional safety diagnostics
- Suitable for automotive applications

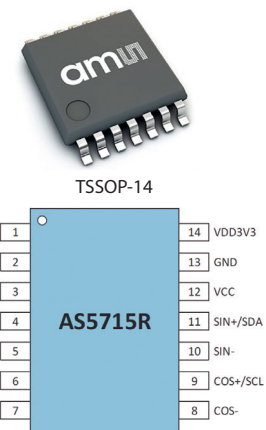
### Benefits

- Flexible PCB design possible, enabling hollow shaft and side shaft applications
- Adaptable to the pole pair count of the motor
- Low torque ripple and motor noise and increased efficiency
- 3.3 to 5.8  $\mu\text{s}$  propagation delay dependent on filter setting
- Easy replacement of existing AMR/GMR sensors
- ASIL C(D) as SEooC
- AEC-Q100 Grade 0 qualified up to -40 to 160  $^{\circ}\text{C}$

### Block Diagram

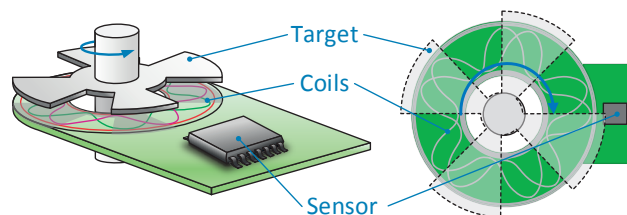


### Package



### Typical Application

- BLDC motor control
- Traction motors
- Electronic power steering
- Mirror LIDAR
- Replacement of Resolvers



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