

STATE-OF-THE-ART GMR GEAR TOOTH SPEED SENSING

50% Larger Air Gaps Allows for Optimal System Size and Robustness

Electrified powertrains are all about efficiency. But, the larger the vehicle, the harder it is to achieve the right balance of motor size and power for hills and acceleration. An EV transmission can provide maximum motor power and efficiency, enabling longer ranges and delivering on performance.

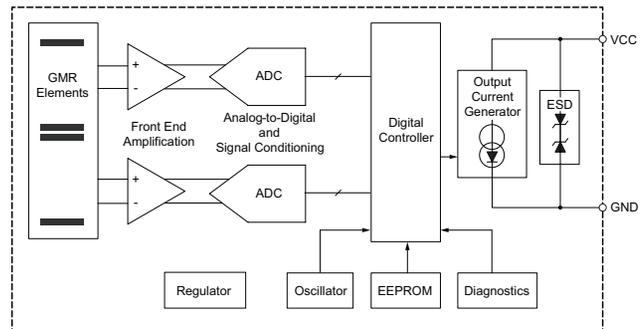
Ideal for single-speed or two-speed transmissions, Allegro's high-performance giant magnetoresistance (GMR) speed and direction sensor ICs offer a 50% larger air gap, giving installation flexibility – reducing system size and cost. With inherent stray field immunity and impressive EMC performance, these are perfect for compact system designs where EMI and efficiency are concerns.

The ATS19480 and ATS19580 are designed for use in conjunction with ferromagnetic gear tooth targets and is orientation compatible with Hall-effect technology. The fully integrated solutions sense at large operating air gaps and over a large air gap range allowing placement flexibility for system design optimization. Optimal system design is vital for reducing system size, cost, and weight; ideal for EV applications.

The user-friendly two-wire solutions are ideal for the future of transmission designs where speed and/or direction information are required using ferromagnetic gear tooth targets. The newly introduced ATS19480 provides accurate speed measurement over a wide operating air gap range 50% greater than its Hall-effect predecessor. Its counterpart, the ATS19580, provides robust speed and direction information with industry leading vibration immunity, also over the increased operating air gap range. To simplify design-in further, this family of products is offered in a fully integrated single-in-line package with a monolithic GMR IC, a protection capacitor for EMC robustness, and an optimized back-bias magnetic circuit.

The State-of-the-art GMR technology is on a monolithic IC incorporating industry-leading signal processing to guarantee

Functional Block Diagram



accurate response to low-level differential magnetic signals for reduced controller codes and guaranteeing no flatline in the presence of system perturbations, such as thermal gradients, vibration, and air gap dynamics. The differential sensing offers inherent rejection of interfering common-mode magnetic fields.

Functional safety is also an essential part of Allegro's designs. Integrated diagnostics are used to detect an IC failure that would impact the output accuracy, providing coverage compatible with an ASIL B rating. ASIL reporting can be enabled or disabled as a product offering depending on the applications' needs. Built-in EEPROM scratch memory offers traceability of the device throughout the IC's product lifecycle.

The product family is available in the SN package, a lead-free 3-pin single-in-line package (SIP), that integrates the GMR IC, EMC capacitor, and magnet in a single overmold for ease of use and advanced performance. The "SN" has a tin-plated leadframe and an additional molded lead-stabilizing bar for sturdy shipping and ease of assembly.



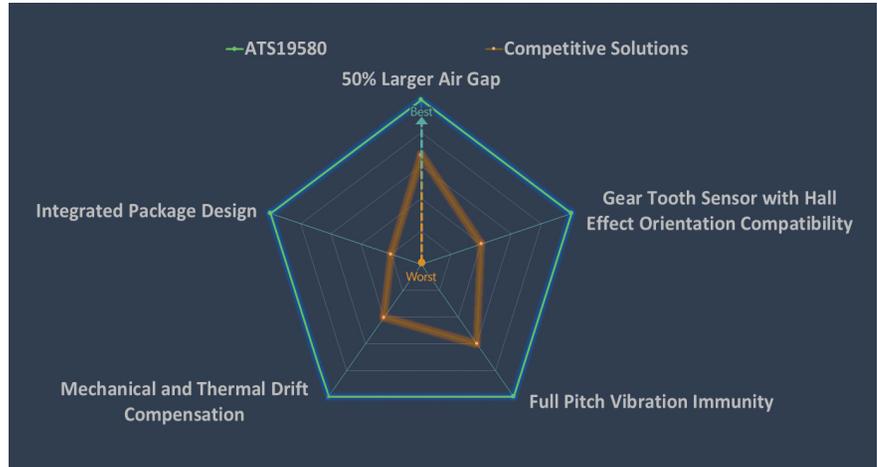
Features and Benefits

- Fully integrated high performance gear tooth sensing, speed and/or direction
- Single-in-line package contains GMR IC, protection capacitor, and optimized magnet
- Increased air gaps allow optimal placement for small, lighter system design
- Advanced signal compensation eliminates flatline conditions due to system dynamics
- Orientation compatible with Hall-effect technology
- Integrated ASIL diagnostics and certified safety design process (with optional fault reporting)

Setting a New Standard in Transmission Sensor Performance

With maximum design flexibility and cutting-edge capabilities, our products are put to the test to see how we perform against our competitors. The results?

Allegro’s superiority in algorithm and integrated package design outperforms competitive solutions making it the most reliable and durable solution for your transmission applications.



Allegro’s ATS19480 and ATS19580 are redefining gear tooth sensing.

Ideal for the latest spatially optimized transmission designs, these sensors enable system weight reductions, increased fuel economy, expanded driving ranges, and high-performance speed sensing – especially for electrified vehicles.

| ATS19480 | ATS19580 |
|---|---|
| 2-wire Speed | 2-wire Speed & Direction |
| Large air gap operation, accurate speed measurement and ASIL rating in a fully integrated package incorporating the GMR IC, EMC capacitor and magnetic circuit. | Large air gap operation, accurate speed & direction information, vibration immunity and ASIL rating in a fully integrated package incorporating the GMR IC, EMC capacitor and magnetic circuit. |
| Operating Air Gap: 1.5 to 4.5 mm | |

Performance starts with Precision Assembly

The “SN” lead-free 3-pin single inline package (SIP) offers precision assembly for optimized IC to magnet positioning.

The reduced tolerance stack between the IC and magnet increases sensor accuracy and leaves margin for in-application installation tolerances.

