

# TLE5027C

Highly accurate and sensitive differential **iGMR** speed sensor with direction detection for automotive powertrain and industrial applications

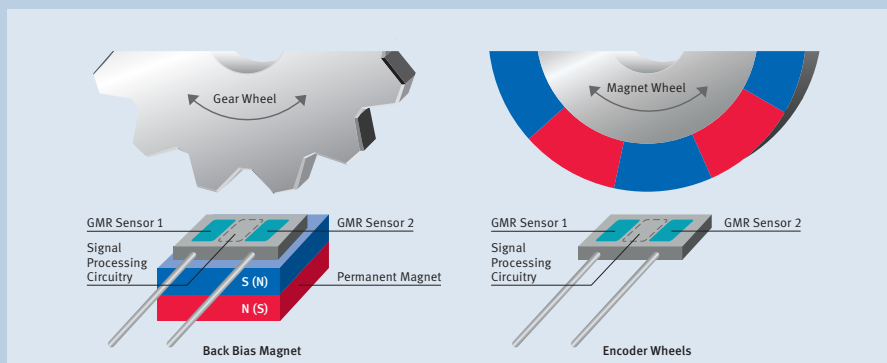
The TLE5027 uses the giant magneto resistive (GMR) effect, which is by a factor >10 more sensitive compared to the Hall-effect. The TLE5027 detects the motion and position of ferromagnetic magnet structures by measuring the change of the magnetic field induced by this structure, which can be a magnetic encoder wheel, ferromagnetic gear wheel or any similar structure. In case of any non-encoder based application like gear wheels the magnetic field is generated by applying a specially optimized back bias magnet to the sensor. As the GMR sensor measures the in plane components of the magnetic field the sensor switches in phase with the edges of a tooth/gap pair of a gear wheel or north/south pole pair of a magnetic encoder. The very high sensitivity of the GMR effect enables the TLE5027 to measure very large airgaps with encoder wheels or be back biased with excellent airgap performance using a low-cost ferrite material for the magnet.

The sensor has a fast start up time and the sensor switches with its hidden adaptive hysteresis algorithm, which ensures high accuracy over airgap jumps, vibrations, run-out events ,etc. Within the first 3 magnetic edges after start up the sensor provides the direction information, which is given as pulse width modulated output.

TLE5027 is well suited for harsh environmental conditions prevalent in automotive or certain industrial applications by its wide temperature range as well as high ESD and EMC robustness. In addition the TLE5027 provides the benefit of a very low current consumption. With its features the TLE5027C is ideal for applications like today's crankshaft or transmission speed sensing in automotive or similar industrial applications.

TLE5027 is perfectly suited for applications like:

## Gear wheel application with back bias magnet and magnetic encoder wheel application



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## Features

- Excellent sensitivity
- High jitter performance
- Direction detection
- Hidden adaptive algorithm
- Very large operating airgaps
- Advanced performance by dynamic self calibration principle
- Very low current consumption
- 3-wire PWM voltage interface
- Wide operating temperature ranges of  $-40^{\circ}\text{C} \leq T_j \leq +175^{\circ}\text{C}$
- Reverse voltage protection at  $V_s$ -pin
- High ESD robustness
- Module style package with two integrated capacitors:
  - 4.7nF between Q and GND
  - 47nF between  $V_s$  and GND: Required for micro cuts in power supply and optimal EMC robustness

# iGMR

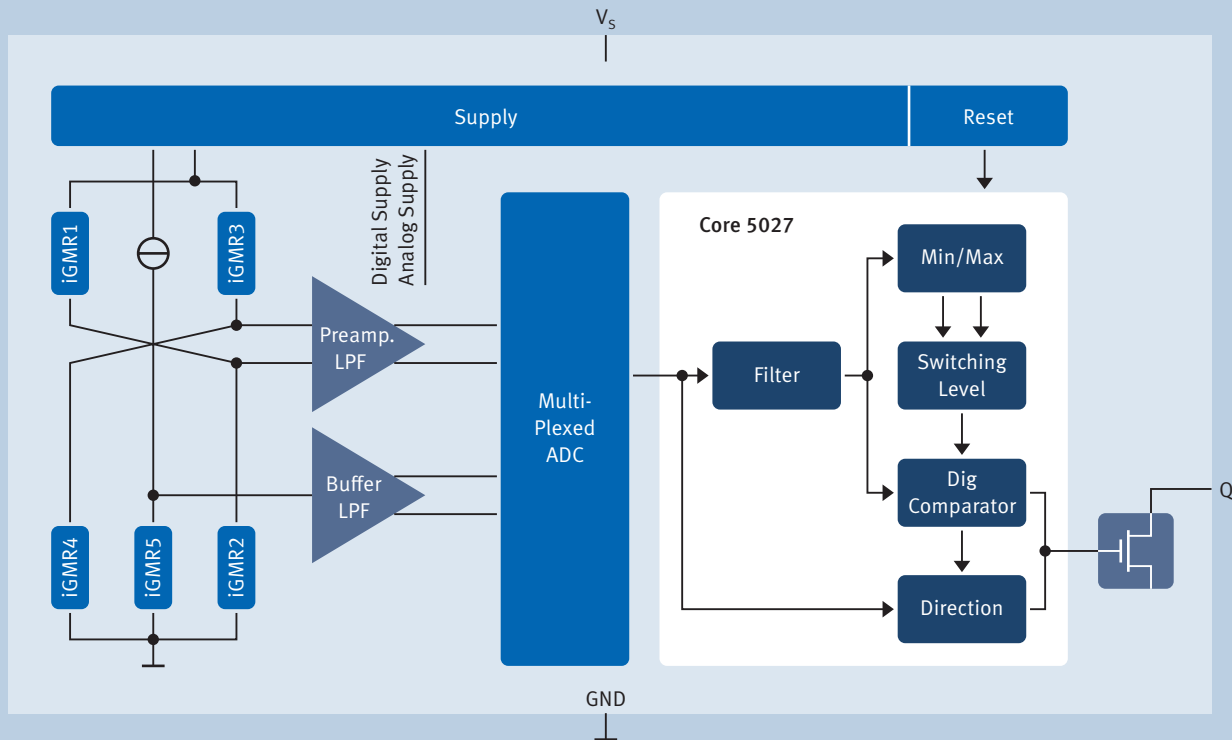
 Halogen-Free

 RoHS  AEC Qualified

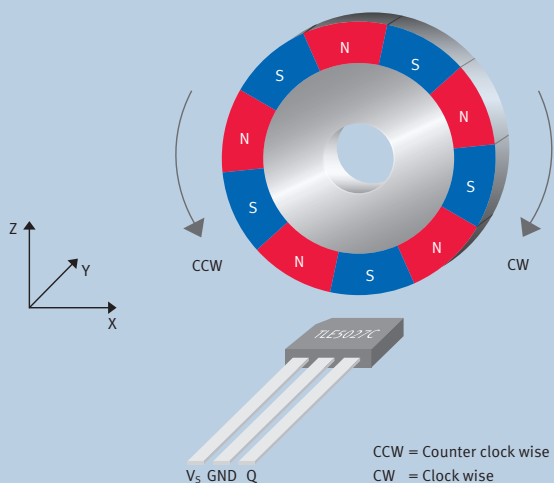
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Block Diagram



## Definition of Direction Detection



## Product Summary

Sales Name	Description	Order Code
TLE5027C E6747	TLE5027 in PG-SSO-3-92 package with CW 45µs and CCW 90µs PWM pulse	SP000317779
TLE5027C-I E6747	TLE5027 in PG-SSO-3-92 package with CW 90µs and CCW 45µs PWM pulse	SP000481606

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Order Number: B142-H9289-G2-X-7600  
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