

Product Brief

TLE4941plusC

Differential Hall IC for wheel speed sensing

TLE4941plusC, a differential Hall sensor for measuring magnetically the car's wheel speed, is the latest offspring of the extremely successful TLE4941 family, based on Infineon's most recent sensor technologies for front-and backend. Designed as drop-in replacement the TLE4941plusC is, as its predecessors, a single chip solution combining Hall sensor elements and both analogue and digital signal processing in one single chip. Its differential principle makes it immune to any kind of undesired magnetic fields and disturbances. The Hall element distance has been downsized to 2 mm to be also fit for extremely small encoders. Several product improvements, both electrical and magnetic, have been put in place, such as an accelerated calibration during start-up phase and higher load dump robustness. The formerly optional first-edge-detection, a feature for quick start-up, providing a reliable output signal even before calibration is fully completed, has now become standard.

TLE4941plusC has a standard 2-wire current interface, high ESD robustness and works in the wide temperature range present in the harsh automotive environment. Magnetic and device offsets are canceled by a sophisticated selfcalibration algorithm immediately after start-up.

The TLE4941plusC is an extremely robust product due to Infineon's high quality standards as experienced automotive semiconductor supplier. After several hundred million units sold, Infineon's active wheel speed sensors have largely proven to be the perfect match for wheel speed sensing in all aspects of functionality, robustness and flexibility.

Applications

- › Reliable wheel speed sensing in automotive applications
- › Anti-lock Braking System (ABS)
- › Electronic Stability Program (ESP)
- › Automatic transmissions

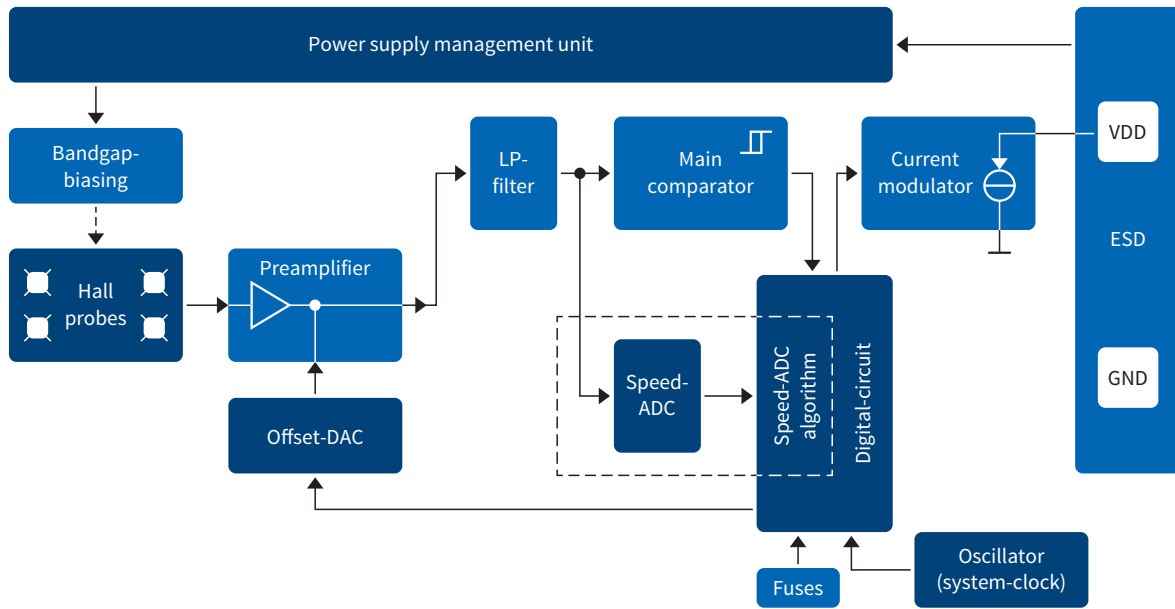
Features

- › Two-wire current interface: minimizes wiring
- › Dynamic self-calibration principle: compensates offsets
- › Single chip solution: ensures outstanding reliability
- › High sensitivity: can be used for large airgap applications
- › South and north pole pre-induction possible: works for both encoders and tonewheels
- › High resistance to piezo effects: suits sensor overmolding wide operating temperature range
- › C type with 1.8 nF overmolded capacitor: enhances EMC & micro-break resistance, without any external components

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TLE4941plusC block diagram



The TLE4941plusC signal path includes a pair of Hall probes (2 mm spacing), a differential amplifier and a comparator feeding a switched current output stage.

Additionally, the circuit has a feedback loop for offset compensation which consists of a signal-speed ADC, a Digital Signal Processor (DSP) and an offset D/A converter.

| Parameter | Value | Unit |
|---------------------------|--------------|------------|
| Operating voltage | 4.5 ... 24 | V |
| Supply current (L/H) | 7/14 | mA |
| Min magn. flux density | 0.7 | mT |
| Frequency range | 1 ... 10000 | Hz |
| Temperature range | -40 ... +150 | °C |
| Jitter | 2 | % |
| Calibrated mode available | > 4 | # of edges |

| Type | Sales code | Package |
|--------------|-------------|----------|
| TLE4941plusC | SP000478508 | SSO-2-53 |

Published by
Infineon Technologies AG
81726 Munich, Germany

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