



XENSIV™ – TLE5549iC: Much more than an ABS sensor!

Discover the first ABS wheel speed sensor with high resolution
and immediate direction detection

Infineon Technologies Austria AG: Simone Fontanesi

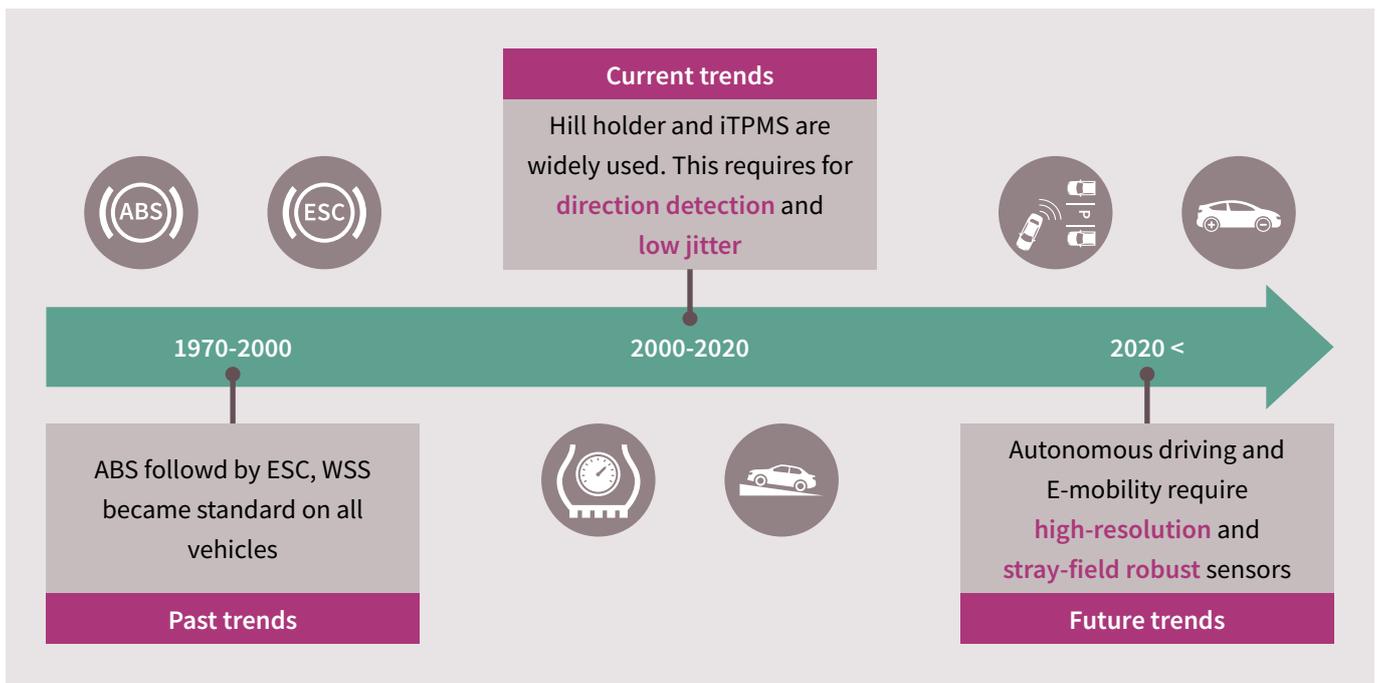
www.infineon.com



The XENSIV™ TLE5549iC is Infineon’s first wheel speed sensor (WSS) with high resolution and fast direction detection designed for sophisticated vehicle control systems and autonomous parking applications. This advanced functionality means it is ready for future automotive applications.



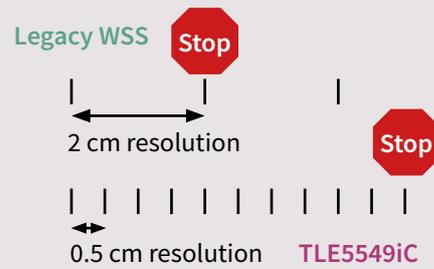
Anti-lock braking system (ABS) sensors have been in use for over fifty years to increase car safety and comfort. Reaching beyond standard ABS, traction control system (TCS) and electronic stability control (ESC) applications, more recent sensors with low jitter and rotational direction information are enabling new use cases such as hill holder functions and indirect tire pressure monitoring systems (iTPMS).



Now, to support autonomous parking and driving, OEMs and system-level companies need higher-resolution, faster information on car movements. This information comes directly from the wheels – a ground truth reference positioning the “ego” car. Data from ABS sensors is used by the electronic control unit (ECU) to work out precisely how far the car has moved. This information is merged with the additional environment data from on-board sensors that detect the surroundings such as radar, camera and LIDAR.

Standard wheel speed sensors used in ABS applications provide a system-level resolution on car movements of approximately 2 cm. TLE5549iC improves this movement resolution by a factor of up to four, pushing the limit to just 0.5 cm.

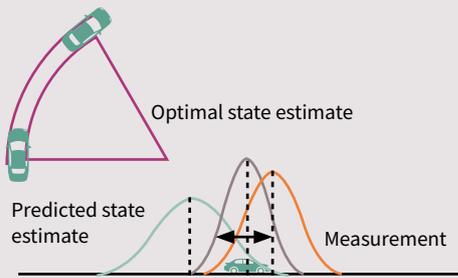
4 times improved spatial resolution is enabling more accurate, faster, and smoother control of the car movement



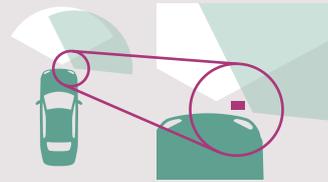
This high resolution is enabling additional use cases such as automated parking in tight spaces, autonomous trailer connection, and much more. It also improves the accuracy of vehicle positioning estimations in areas where the GPS signal is weak.



High-res WSS makes autonomous parking smoother, more precise and faster



High-res WSS increases vehicle positioning accuracy in areas where GPS is not available

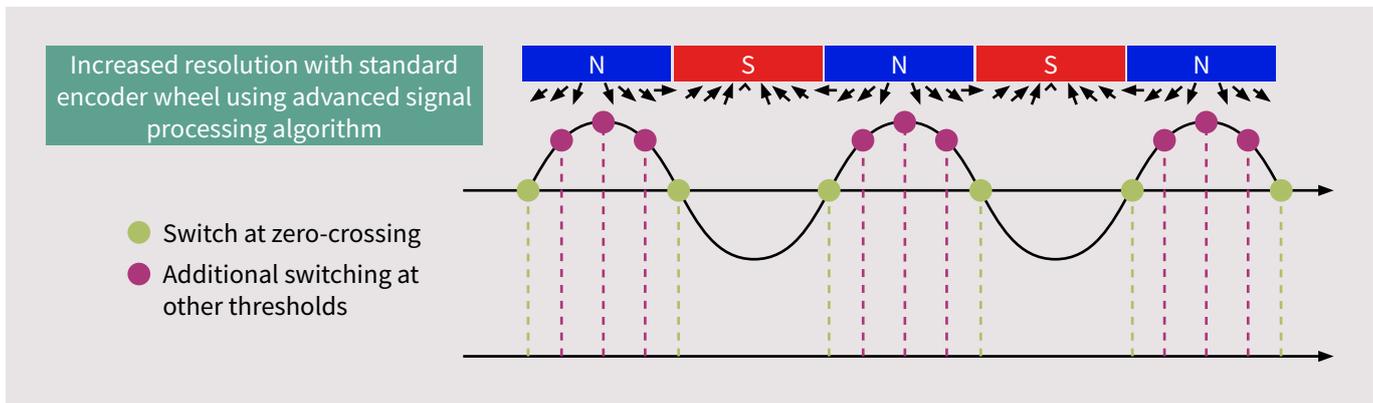


High-res WSS closes the blind spot gaps of sensors that collect information on the vehicle's surroundings



High-res WSS enables the autonomous trailer connection use case

Thanks to a new sensing element technology, known as linearized TMR (tunnel magnetoresistance), and advanced digital algorithms, Infineon's new sensor interpolates the magnetic input signal coming from the magnetic encoder wheel and provides additional information to the ECU.



The sensor uses an extension of the standard AK protocol, considered state of the art for ABS applications, to ensure compatibility with existing ECU systems. At most, designers only need to make minor software adaptations to correctly interpret the additional information coming from the sensor. This means that system integrators and OEMs can keep the majority of their system (e.g. magnetic encoder wheel, ECU, measurement and protection circuit) unchanged, and improve the system performance just by replacing the sensor.

The new algorithms also improve power-on performance dramatically. While state-of-the-art wheel speed sensors come with an uncertainty margin of up to ± 6 cm in relation to direction of rotation, TLE5549iC establishes the direction of rotation of the wheel after less than ± 0.5 cm of movement. In other words, on the very first output protocol.



Other highlights of the TLE5549iC include excellent vibration behavior, extremely accurate duty cycle performance, improved stray field robustness and a higher ASIL level (with support for ASIL-D systems). This impressive lineup of features makes the TLE5549iC the perfect magnetic speed sensor for next-generation ABS platforms. It enables new use cases such as automated parking, automated trailer connection and electric engine control, while ensuring full compatibility with existing systems and application requirements.



Feel free to email us at TLE5549@infineon.com if you have any questions or require support. For more information please visit our websites, www.infineon.com/magnetic-speed

Where to buy

Infiniteon distribution partners and sales offices:

www.infineon.com/WhereToBuy

Service hotline

Infiniteon offers its toll-free 0800/4001 service hotline as one central number, available 24/7 in English, Mandarin and German.

- > Germany 0800 951 951 951 (German/English)
- > China, mainland 4001 200 951 (Mandarin/English)
- > India 000 800 4402 951 (English)
- > USA 1-866 951 9519 (English/German)
- > Other countries 00* 800 951 951 951 (English/German)
- > Direct access +49 89 234-0 (interconnection fee, German/English)

* Please note: Some countries may require you to dial a code other than "00" to access this international number.
Please visit www.infineon.com/service for your country!



Mobile product catalog

Mobile app for iOS and Android.

www.infineon.com

Published by
Infineon Technologies AG
81726 Munich, Germany

© 2021 Infineon Technologies AG.
All rights reserved.

Please note!

This Document is for information purposes only and any information given herein shall in no event be regarded as a warranty, guarantee or description of any functionality, conditions and/or quality of our products or any suitability for a particular purpose. With regard to the technical specifications of our products, we kindly ask you to refer to the relevant product data sheets provided by us. Our customers and their technical departments are required to evaluate the suitability of our products for the intended application.

We reserve the right to change this document and/or the information given herein at any time.

Additional information

For further information on technologies, our products, the application of our products, delivery terms and conditions and/or prices, please contact your nearest Infineon Technologies office (www.infineon.com).

Warnings

Due to technical requirements, our products may contain dangerous substances. For information on the types in question, please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by us in a written document signed by authorized representatives of Infineon Technologies, our products may not be used in any life-endangering applications, including but not limited to medical, nuclear, military, life-critical or any other applications where a failure of the product or any consequences of the use thereof can result in personal injury.