

XENSIV™ TLE5502D

TMR angle sensor

High accuracy, high availability TMR analog angle sensors for safety applications

Infineon's second-generation TMR-based analog magnetic angle sensor, the XENSIV™ TLE5502D, sets a new benchmark for high accuracy and functional safety in a compact form factor. The TLE5502D is a dual-die device that enables four redundant measurement channels, delivering the highest levels of safety integrity for demanding automotive applications.

The XENSIV™ TLE5502D angle sensors are particularly well-suited for rotor position sensing applications, offering full 360° angle measurement capability and a high output voltage swing. The device supports direct interfacing to microcontroller ADCs, eliminating the need for external amplifiers and helping to reduce overall system cost and complexity.

Functional safety has been a core design priority for the TLE5502D angle sensors. Developed in accordance with ISO 26262, the device provides two independent ASIL D channels, making it an ideal solution for fail-operational applications such as Electronic Power Steering (EPS).

The TLE5502D sensors compact VQFN-16 package enables seamless integration into space-constrained motor designs. Qualified to AEC-Q100 Grade 0, the TLE5502D are designed to withstand the demands of harsh automotive environments, demonstrating exceptional durability and long-term reliability.



Key features

- Angle accuracy: < 0.9 °
- High sensitivity
- ISO 26262 SEooC for safety requirements up to ASIL D
- High output voltage >270 mV/V for direct ADC interfacing
- Small form factor: VQFN 16 (3x3x0.85 mm³)
- AEC-Q100, Grade 0 qualified
- Decoupled TMR bridge design for high availability

Key benefits

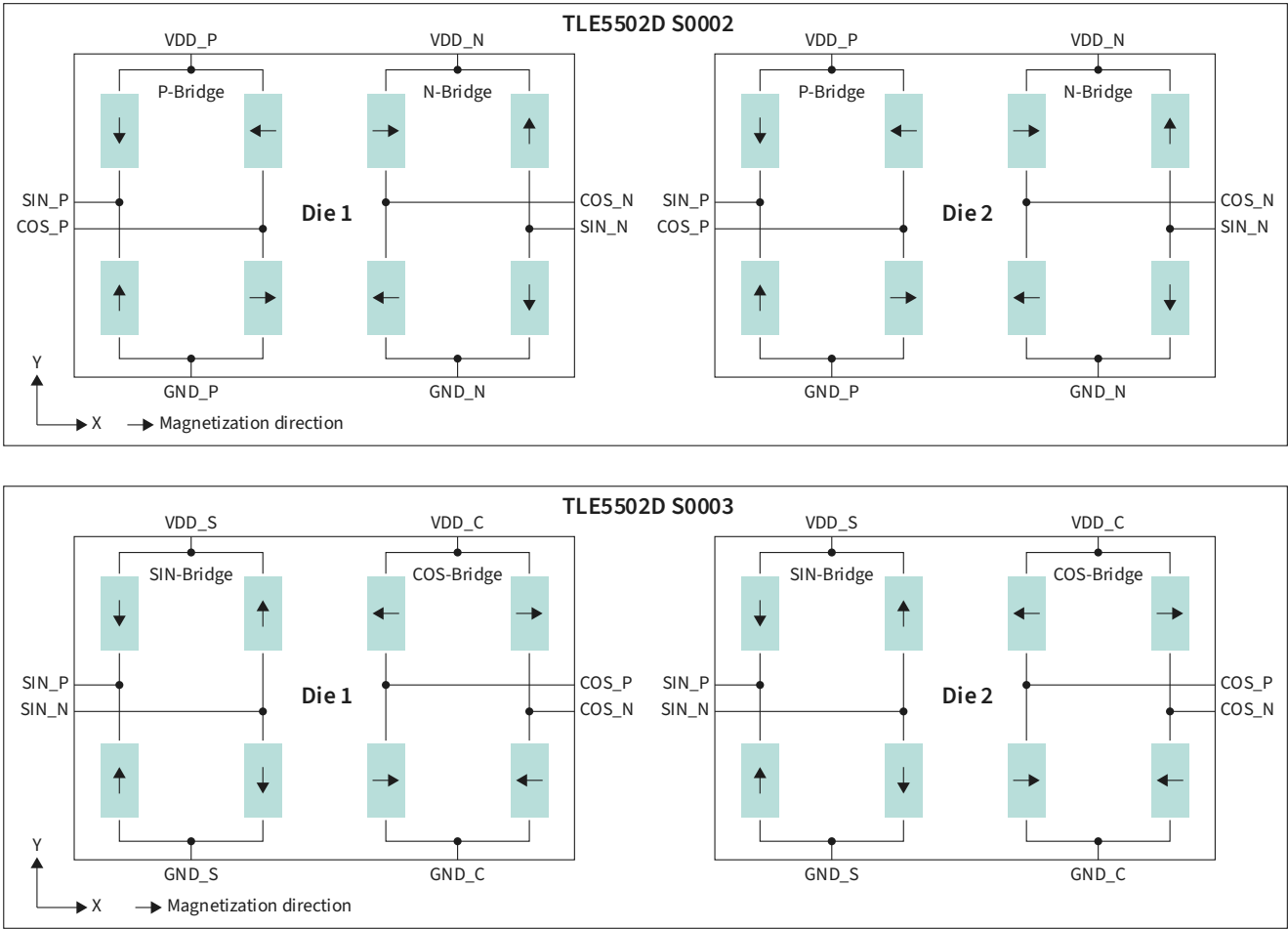
- Ensures precise and safe motor control
- Lower motor commutation noise and improved efficiency
- Reduced software effort to improve accuracy
- Tiny package designed to fit directly within the motor
- 4-channel integration for cost effective systems
- Direct microcontroller interface for lower BOM

Key applications

- BLDC motor control
- Electric power steering (EPS)
- Steer by wire
- Electro-mechanical braking system (EMB)
- Industrial drives

PRODUCT BRIEF

Block diagram



Product table

Sales Name	Description	Package	Ordering Code
TLE5502D S0002	TMR angle sensor, 4 channels, decoupled bridges	PG-VQFN-16-5, Grade 0	SP005446220
TLE5502D S0003	TMR angle sensor, 4 channels, Sin/Cos bridges	PG-VQFN-16-5, Grade 0	SP005446223

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