APPLICATION BRIEF

Accurate 2-wheeler motor control

With XENSIV™ magnetic current sensors

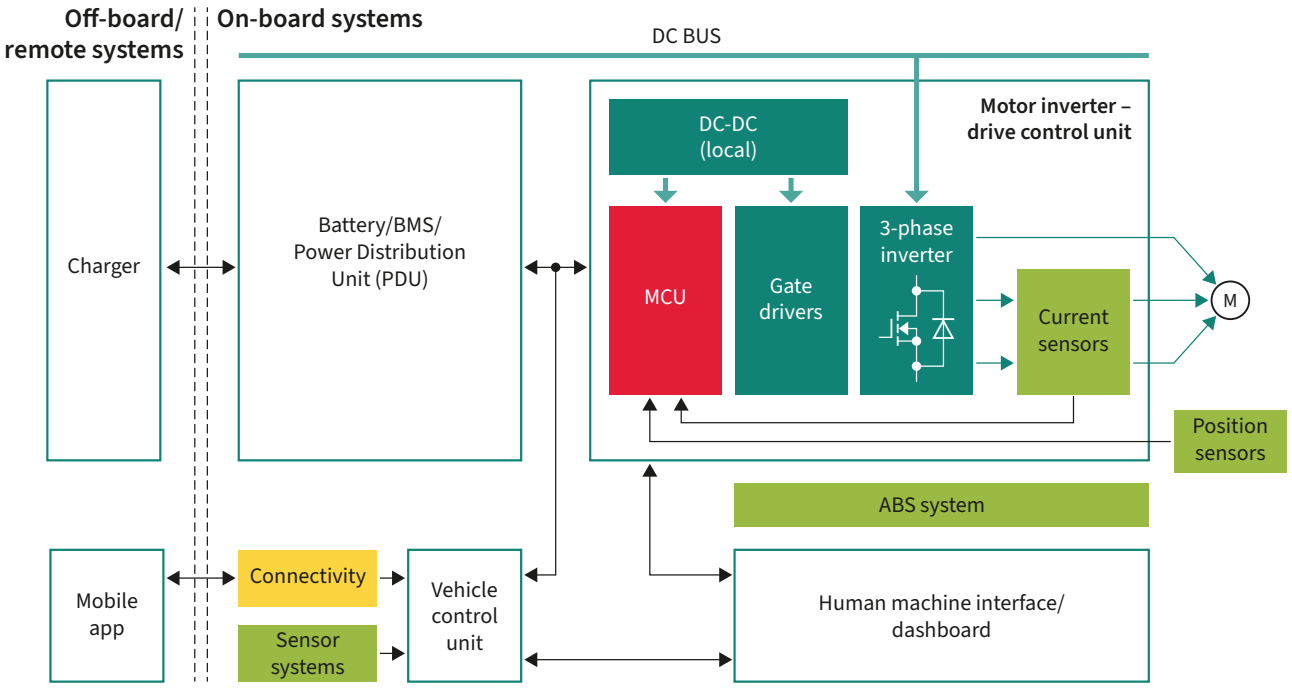
Rising standards of living, a growing awareness of the need to conserve limited natural resources, and the effects of global warming are driving a shift from mechanical to electronic control systems in small conventional vehicles such as bicycles and motorcycles. This trend is apparent worldwide, especially in emerging markets. In addition, demand for small electric vehicles such as electric-powered bicycles (e-bikes and pedelecs) is growing around the world.

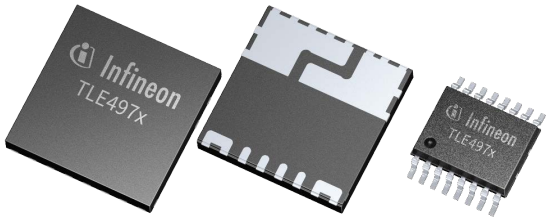
Increasingly strict emissions legislation in many countries is also driving demand for efficiency-enabling semiconductor solutions in the small 1- to 2-cylinder combustion engine segment. Looking beyond standard carburetors, customers are increasingly looking for more electrified solutions. As the market leader in automotive electronics, Infineon is ideally positioned to meet growing needs for fuel-efficient solutions through a wide range of microcontrollers, sensors, power supplies, transceivers, driver ICs, MOSFETs, IGBTs, as well as fully integrated U-chip solutions.

Key features

- Low total error over temperature and lifetime
- Sensitivity drift over temperature down to 0.8% (-40°C to 150°C)
- Low phase shift at motor current frequency and high bandwidth
- Low power dissipation
- Easy integration and small package options
- Programmable measurement range
- ISO 26262-compliant development

XENSIV™ current sensors in 2-wheeler inverter architecture





www.infineon.com/current-sensors

XENSIV™

APPLICATION BRIEF

The 2-wheeler industry requires current sensing solutions that combine optimal torque control with adaptability to different mechanical design and power classes. To reduce overall system size, inverters for e-scooters must enable higher levels of power density. An in-phase current sensor helps to provide the current information for motor commutation with Field Oriented Control (FOC) techniques.

XENSIV™ current sensors are exceptionally precise and stable over temperature and lifetime thanks to industry-leading Hall-based magnetic technology. They also come with a digitally assisted analog signal path, which enables low total error behavior over temperature and lifetime. In addition, the high bandwidth and low insertion resistance achievable in combination with typical sensing structures makes XENSIV™ the perfect choice for accurate and efficient torque control.

XENSIV™ current sensors offer a compact solution to sense the current flowing in an external conductor (busbar or PCB track). Bulky core-based sensors can be easily replaced by a small SMD device. The two package variants give system integrators high flexibility, requiring only 3.5 x 4.5 mm or 6 x 5 mm of space for VSON and TDSO packages respectively.

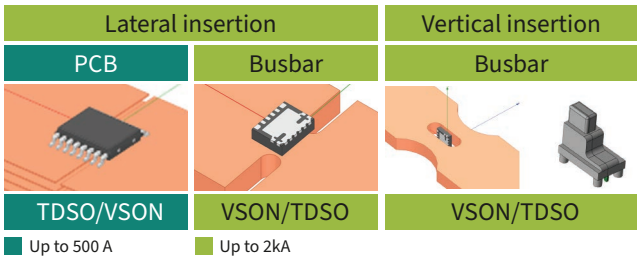
ISO 26262-compliant development and safety documentation allow for ratings up to ASIL B.

We work with external partners in order to provide system-level solutions. Current sensing modules based on XENSIV™ current sensors with 2nd level overmolding have been developed to ease integration into any inverter solution.

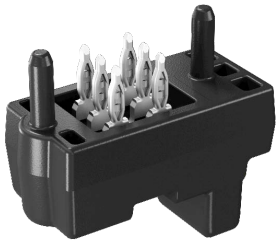
With a wide-ranging magnetic sensor portfolio, Infineon is the perfect partner to meet future market requirements. To learn more about current sensing in automotive inverters, have a look at our whitepapers and application notes available for download at www.infineon.com/current-sensors .

Learn more about our solutions for light vehicles at link to

XENSIV™ current sensors integration possibilities



XENSIV™ current sensors sensing module (Partner: Swoboda)



Product name	Ordering code	Description
TLE4972-AE35D5	SP004914362	3.3 V high precision current sensor based on Hall technology in a TDSO-16 package
TLE4972-AE35S5	SP004914370	3.3 V high precision current sensor based on Hall technology in a VSON-6 package
TLE4973-AE35D5-S0001	SP005353128	5 V high precision current sensor based on Hall technology in a TDSO-16 package, semi-differential output mode
TLE4973-RE35D5-S0001	SP005448166	5 V high precision current sensor based on Hall technology in a TDSO-16 package, semi-differential output mode
TLE4973-RE35D5-S0010	SP005448161	5 V high precision current sensor based on Hall technology in a TDSO-16 package, single-ended AOUT only
TLE4973-AE35S5-S0001	SP005353131	5 V high precision current sensor based on Hall technology in a VSON-6 package, semi-differential output mode
TLE4973-RE35S5-S0001	SP005448267	5 V high precision current sensor based on Hall technology in a VSON-6 package, semi-differential output mode
TLE4973-RE35S5-S0010	SP005448259	5 V high precision current sensor based on Hall technology in a VSON-6 package, single-ended AOUT only

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