

Product brief

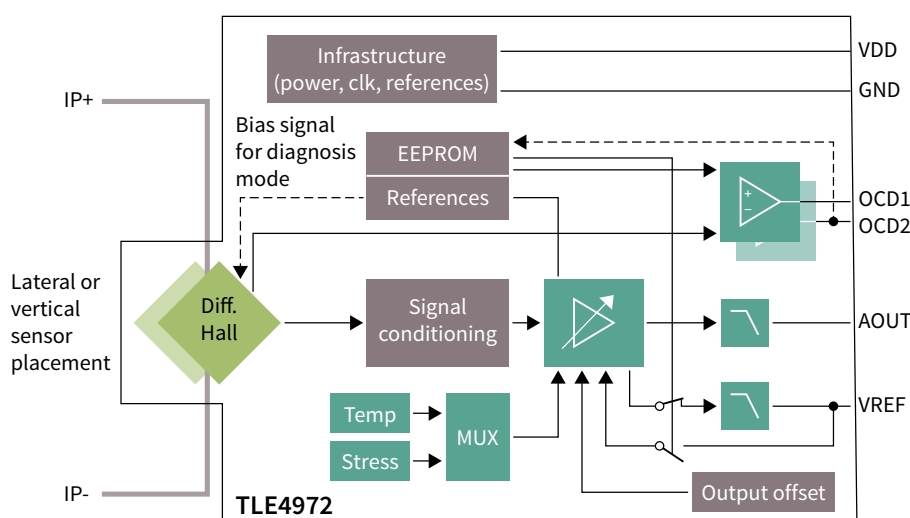
XENSIV™ – TLE4972 magnetic current sensor for automotive applications

The Infineon TLE4972 product family of core-less magnetic current sensors specifically addresses requirements for current sensing in automotive applications. The well-established and robust Hall technology enables accurate and highly linear current measurements of the magnetic field induced by the current. With its compact design and diagnosis modes. The TLE4972 is ideal for xEV applications like traction inverters used in hybrid and battery-driven vehicles, as well as for battery main switches.

With a full scale up to ± 31 mT it is possible to measure currents up to 2,000 ampere. All negative effects (e.g. saturation, hysteresis) commonly known from open loop sensors using flux concentration techniques are avoided. The differential measurement principle allows great stray field suppression for operation in harsh environments. The sensor is available in two packages to support a wide range of different system integration scenarios. Two separate overcurrent detection pins (OCD) provide a fast output signal in case the measurement current exceeds the configured thresholds in typical 0.7 μ s.

The sensor is an ISO 26262 Safety Element out of Context for safety requirements up to ASIL B and is equipped with internal self-diagnostics.

Block diagram



Key features

- > Hall based core-less magnetic current sensor
- > AC and DC sensing
- > Two dedicated pins for overcurrent detection
- > Scalable sensitivity
- > ISO 26262 compliant
- > ASIL B as SEooC
- > Typical bandwidth of 210 kHz

Key benefits

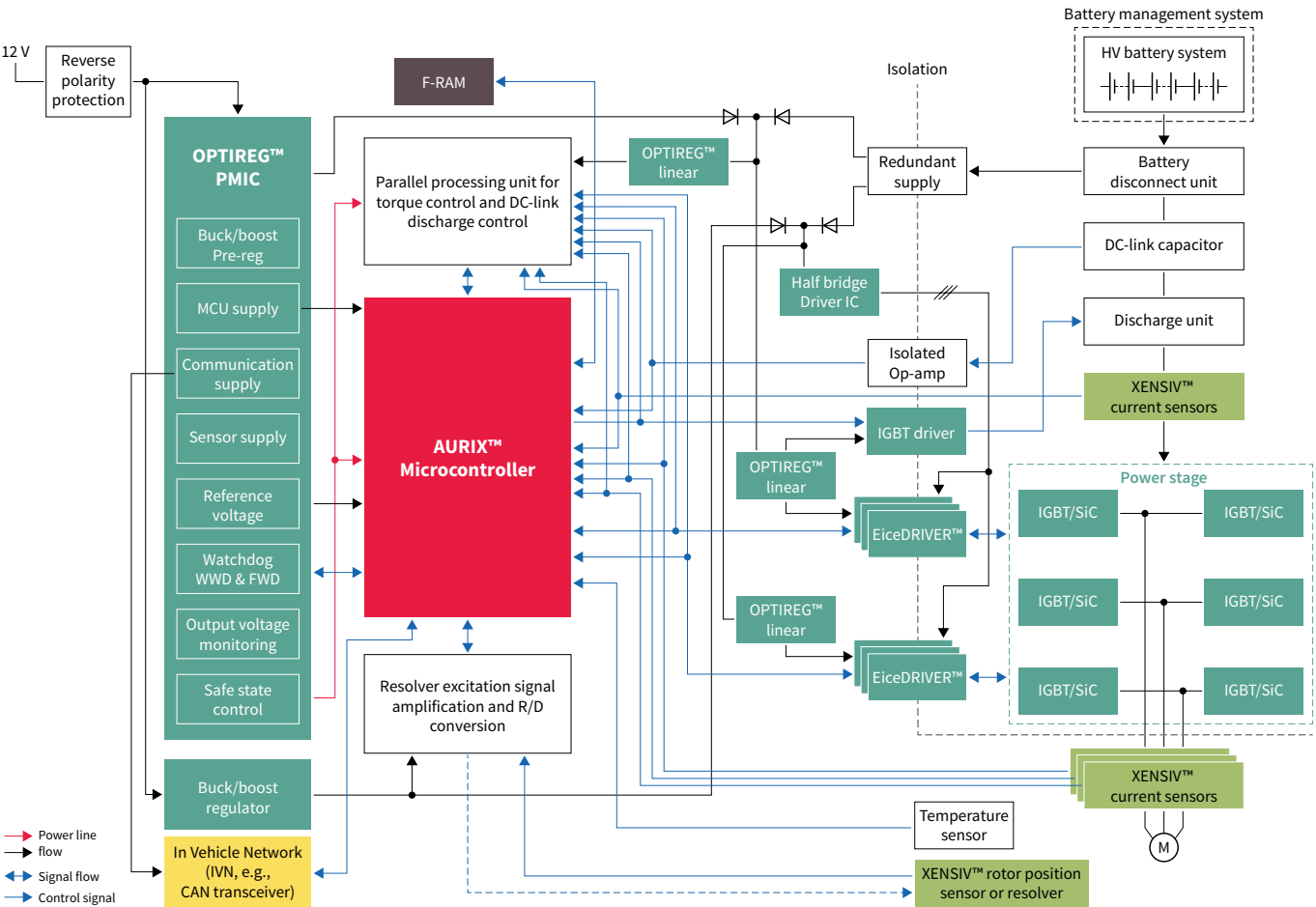
- > High accuracy up to 2 kA
- > Very low error over temperature and lifetime
- > Protection against overcurrent events for fast switching technologies, e.g. SiC
- > No saturation or hysteresis effects
- > Very low power losses through sensing structure
- > Ideal for platform designs

Key applications

- > Traction inverters for xEV
- > Battery main switch for 48 V, 400 V and 800 V
- > Auxiliary drives
- > Overload and overcurrent detection



Application diagram: (H)EV traction inverter system with in-phase and DC-Link current sensing



Product table

Product	Description	Meas. range [mT]	Total drift over temperature & lifetime Typical ($\pm 3\sigma$) and Maximum values	Bandwidth typ. [kHz]	Diagnosis	Interface	ATV	IND	Supply [V]	Package (footprint) [mm]
TLE4972-AE35D5	High precision core-less current sensor with diagnosis capability. External current rail packages for high current measurement.	up to 31	Typ: $\pm 1.4\% \pm 3\sigma$ (25 – 125°C) Min/Max: $\pm 2\%$ (25 – 125°C)	210	OCD 1, OCD 2, OV, UV, diagnosis mode	analog	●	●	3.3	TDSO-16 (5x6)
TLE4972-AE35S5			Typ: $\pm 1.3\% \pm 3\sigma$ (25 – 150°C) Min/Max: $\pm 2\%$ (25 – 150°C)							VSON-6 (3.5x4.5)

Note: Total error on current measurement will depend on sensing structure implementation and EOL calibration accuracy

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