

XENSIV™ – TLE4973 magnetic current sensor

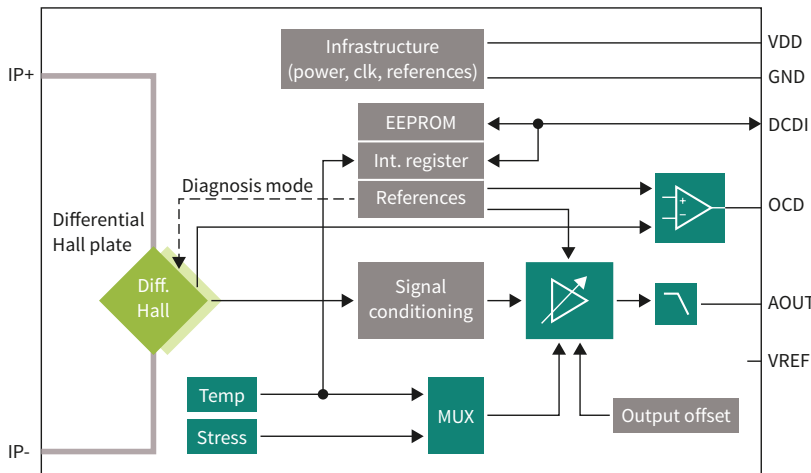
High precision coreless current sensor family for automotive and industrial applications

The TLE4973 products are a family of high precision coreless current sensors for uni- or bi-directional measurement for AC and DC currents from 0 A to up to 2.000 A. All types have an analog output as well as a separate very fast output to indicate an overcurrent event or a failure. The sensors are ideal for use in automotive applications as they are developed according ISO 26262 and classified as ASIL B products. All types come with a self-diagnosis for internal error monitoring. An external diagnosis mode can be triggered via the UART based Digital Control and Diagnosis Interface (DCDI).

To cover the large measurement range, the family offers different implementations: for low currents up to 132 A the sensor comes fully calibrated in a TISON-8 package with an integrated current conductor with only 220 $\mu\Omega$ resistance, for medium to high currents using a thick copper layer PCB or bus bars, two grade 0 package options are available for operations up to $T_{amb} = 150^{\circ}\text{C}$, PG-TDSO-16 and PG-VSON-6.

To optimize the performance in the end-customer application the device settings like sensitivity and over current thresholds can be adjusted using the DCDI interface. This dedicated UART type interface also allows programming of the internal EEPROM, read out of safety status and temperature via the microcontroller. Thanks to an internal charge pump no extra voltage needs to be applied.

Block diagram



Key features

- Measurement range from 0 A to 2 kA
- Sensitivity error drift over temperature down to 0.8 percent for ambient temperature in -40°C to 150°C
- Analog output signal with large bandwidth (typ. 240 kHz)
- Very fast overcurrent detection up to $2 \times I_{FSR}$ (response time $< 1.0 \mu\text{s}$)
- Product ASIL B classified
- Dedicated UART type interface for diagnosis and programming
- UL certified devices

Key benefits

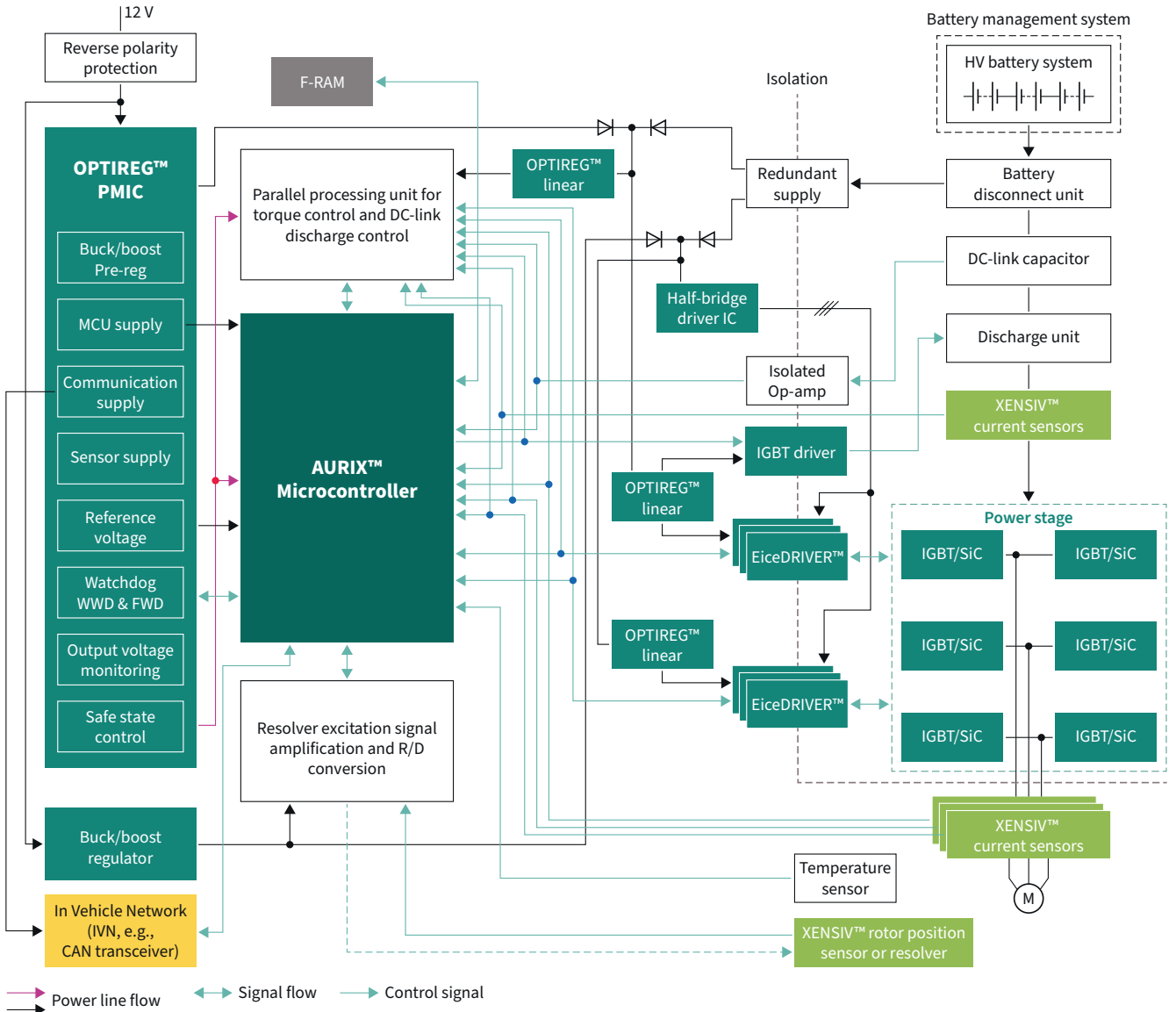
- High flexibility enables use of sensors for different power ranges
- Very precise measurement over-temperature and lifetime
- No hysteresis or saturation effects
- Overcurrent protection without external circuitry and no extra cost also for upcoming technologies (e.g. SiC, GaN)

Key applications

- Electric drives, e.g. BEV, PHEV, HEV, MHEV
- On-board-charger
- Overcurrent detection, e.g. battery disconnect or BMS
- Power distribution
- PV inverters

PRODUCT BRIEF

Application diagram



Product table (overview)

Product	Current range	Bandwidth typ. [kHz]	Sensitivity	Accuracy [%]	Output noise density	Certification	Industrial	ATV	Supply [V]	Current rail	Package
TLE4973-A025T5-S0001	27.5 [A]	210	65.5 mV/A	< 2	290 [μA/√Hz]	AEC-Q100	●	●	5.0	Internal	TISON-8-6
TLE4973-A050T5-S0001	55 [A]	210	32.8 mV/A	< 2	290 [μA/√Hz]	AEC-Q100	●	●	5.0	Internal	TISON-8-6
TLE4973-A075T5-S0001	82.5 [A]	210	21.8 mV/A	< 2	290 [μA/√Hz]	AEC-Q100	●	●	5.0	Internal	TISON-8-6
TLE4973-A120T5-S0001	132 [A]	210	13.7 mV/A	< 2	290 [μA/√Hz]	AEC-Q100	●	●	5.0	Internal	TISON-8-6
TLE4973-R025T5-S0001	27.5 [A]	210	65.5 mV/A	< 2	290 [μA/√Hz]	AEC-Q100	●	●	5.0	Internal	TISON-8-6
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TLE4973-R025T5-S0010	27.5 [A]	210	65.5 mV/A	< 2	290 [μA/√Hz]	AEC-Q100	●	●	5.0	Internal	TISON-8-6
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TLE4973-AE35D5-S0001	34 [mT]	210	53 ¹⁾ [mV/mT]	1	70 [nT/√Hz]	AEC-Q100	●	●	5.0	external	TDSO-16
TLE4973-RE35D5-S0001	34 [mT]	210	53 ¹⁾ [mV/mT]	1	70 [nT/√Hz]	AEC-Q100	●	●	5.0	external	TDSO-16
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TLE4973-AE35S5-S0001	34 [mT]	210	53 ¹⁾ [mV/mT]	1	70 [nT/√Hz]	AEC-Q100	●	●	5.0	external	VSON-6
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