PRODUCT BRIEF

XENSIV™ – TLE4971 magnetic current sensor in TISON-8-6 package

High precision coreless sensor for automotive applications

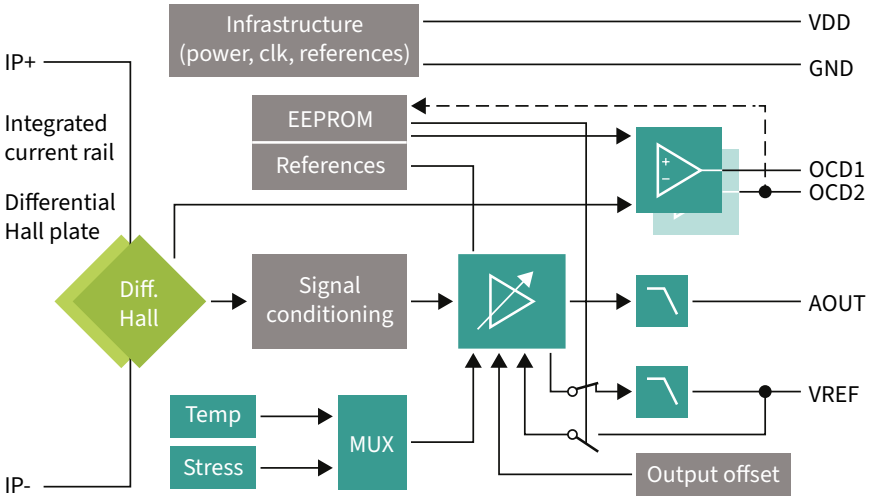
Our XENSIV™ TLE4971 is a high-precision current sensor for bi-directional AC and DC measurements. The device has an analog interface and two fast overcurrent detection outputs which support protection of the power circuitry. Galvanic isolation is provided due to magnetic sensing principle. The new TISON-8-6 package with so called lead tip inspection edge (LTI) enables full optical inspection capability. Additionally, functional safety mechanisms for safety critical applications are implemented.

Infineon's well-established and robust monolithic Hall technology enables accurate and highly linear measurement of currents with a full scale up to 120 A. Negative effects, like saturation and hysteresis, commonly known from core- based sensor techniques are not present in the Infineon open loop, core less sensors principle. The smart current rail design (double U-shape) combined with a differential signal sensing makes the current sensor robust against stray fields.

The integrated primary conductor (current rail) with very low insertion resistance min-imizes the power loss and enables miniaturization of the sensing circuit. Two separate overcurrent pins (OCD1/OCD2) provide a fast output signal in case the current exceeds a pre-set threshold.

The sensor is shipped as a fully calibrated product without requiring any customer end-of-line calibration and comes in a small 8 mm x 8 mm TISON-8 leadless package, which allows standard SMD assembly. Nevertheless the sensor can be reprogrammed for many parameters enabling the customer to achieve maximal adaption for his application.

Block diagram



Key features

- Measurement up to 70 A_{RMS} at 690 V_{RMS} within ±120 A_{FSR}
- Typical error < 2 percent
- Current rail resistance specified at 220 µΩ typical
- Analog output signal with 210 kHz bandwidth
- Fast overcurrent detection up to 2 x I_{FSR} (typ. response time 0.7 µs)
- AEC-Q100 Grade 1 qualified

Key benefits

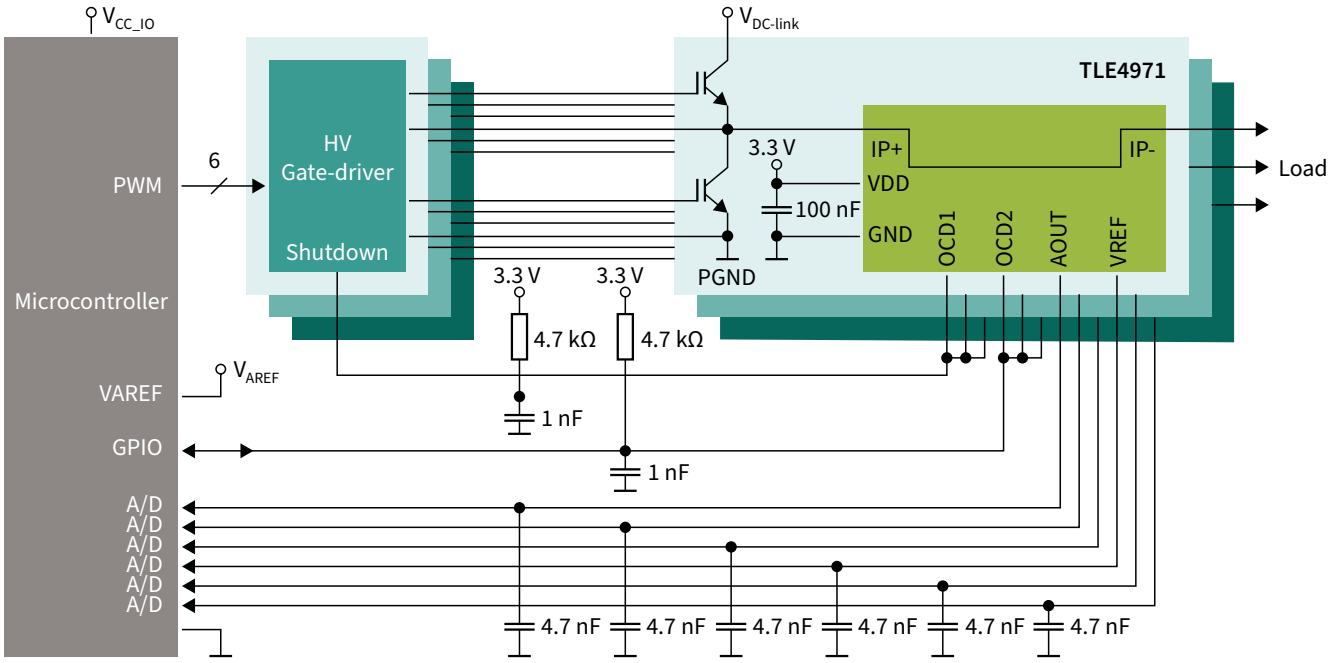
- Ultra-low power loss due to minimal resistance of current rail
- Reliable current measurement over lifetime (no re-calibration)
- Functional isolation for high-voltage application
- ISO 26262 functional safety documentation available

Key applications & use cases

- On board chargers (OBC)
- Safety relevant industrial drives up to 690 V_{RMS}
- High-voltage auxiliary drives in BEVs and PHEVs
- Ground fail detection in EVs

www.infineon.com/current-sensors

Application diagram



Application circuit for three phase system in differential configuration

Product table

Product	Current range [A]	Band-width [kHz]	Sensi-tivity [mV/A]	Accu-racy [%]	OND[1] [µA/√Hz]	Certification	In-dus-trial	ATV	Supply [V]	Current rail	Package
TLE4971-A025N5-U-E0001	25	210	48	< 2	260	AEC-Q100/ UL1577/ IEC 62368-1	•	•	3.3	Internal	PG-TISON-8-6
TLE4971-A025N5-E0001	25	210	48	< 2	260		•	•	3.3	Internal	PG-TISON-8-6
TLE4971-A050N5-U-E0001	50	210	24	< 2	260		•	•	3.3	Internal	PG-TISON-8-6
TLE4971-A050N5-E0001	50	210	24	< 2	260		•	•	3.3	Internal	PG-TISON-8-6
TLE4971-A075N5-U-E0001	75	210	16	< 2	260		•	•	3.3	Internal	PG-TISON-8-6
TLE4971-A075N5-E0001	75	210	16	< 2	260		•	•	3.3	Internal	PG-TISON-8-6
TLE4971-A120N5-U-E0001	120	210	10	< 2	260		•	•	3.3	Internal	PG-TISON-8-6
TLE4971-A120N5-E0001	120	210	10	< 2	260		•	•	3.3	Internal	PG-TISON-8-6

1 Output noise density

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