

XENSIV™ – TLE4971/TLI4971

Magnetic current sensors

High precision coreless sensor for automotive and industrial applications

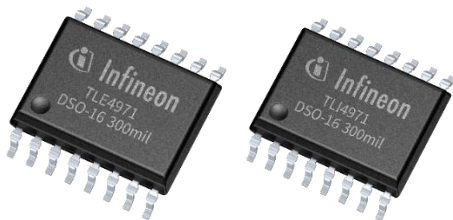
Our XENSIV™ TLE/TLI4971 is a high-precision current sensor for bi-directional AC and DC measurements. The device has an analog interface and two fast overcurrent detection outputs which support protection of the power circuitry. Galvanic isolation is provided due to magnetic sensing principle. The new TDSO-16-50 package with integrated current rail and 8mm clearance and creepage fulfills reinforced insulation requirements at high voltages. Additionally, functional safety mechanisms for safety critical applications are implemented in the automotive version (TLE4971).

Infineon's well-established and robust monolithic Hall technology enables accurate and highly linear measurement of currents with a full scale up to $65 A_{PEAK}$. 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 integrated current rail design (double U-shape) combined with a differential signal sensing makes the current sensor robust against stray fields.

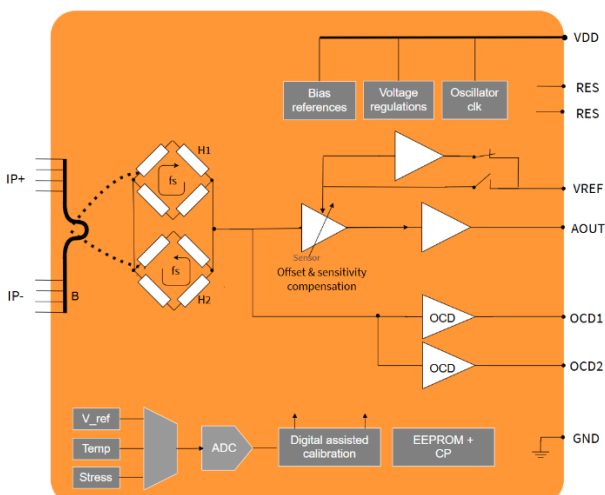
The sensor is shipped as a fully calibrated product without requiring any customer end-of-line calibration and comes in a 300mil package, which allows standard SMD assembly. Nevertheless, the sensor can be reprogrammed for many parameters enabling the customer to achieve maximal adaption for his application.

Key features

- Measurement up to $45 A_{RMS}$ and maximum $\pm 65 A_{FSR}$
- Basic insulation of $1700 V_{IORM}$
- Reinforced insulation $1500 V_{IORM}$
- Total error 0.5%
- Current rail resistance specified at $550 \mu\Omega$ typical
- Analog output signal with 210 kHz bandwidth
- Fast overcurrent detection up to $2.25 \times I_{FSR}$ (typ. response time $0.7 \mu s$)
- AEC-Q100 Grade 0 qualified
- ASIL B for automotive



Device block diagram



Key benefits

- Very low power loss due to low resistance of current rail
- Very high accuracy due to advanced calibration
- Reliable current measurement over lifetime (no re-calibration)
- Reinforced insulation for high-voltage applications
- ISO 26262 functional safety documentation available

PRODUCT BRIEF

The integrated primary conductor (current rail) with very low insertion resistance minimizes 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.

Product table

Product	Accuracy 1)	Current range [A]	Bandwidth [kHz]	Sensitivity [mV/A]	Certification	ATV	IND	Package
TLI4971-A050W2-U- E0001	0.5%	50	210	23.4	UL 1577		✓	PG-DSO-16-50
TLI4971-A040W2-U- E0001	0.5%	40	210	30.4	UL 1577		✓	PG-DSO-16-50
TLI4971-A035W2-U- E0001	0.5%	35	210	35.1	UL 1577		✓	PG-DSO-16-50
TLI4971-A030W2-U- E0001	0.5%	30	210	39.8	UL 1577		✓	PG-DSO-16-50
TLI4971-A020W2-U- E0001	0.5%	20	210	49.1	UL 1577		✓	PG-DSO-16-50
TLI4971-A016W2-U- E0001	0.5%	16	210	60.9	UL 1577		✓	PG-DSO-16-50
TLE4971-A050W2- S0001	0.5%	50	210	23.4	ISO 26262	✓	✓	PG-DSO-16-50
TLE4971-A040W2- S0001	0.5%	40	210	30.4	ISO 26262	✓	✓	PG-DSO-16-50
TLE4971-A035W2- S0001	0.5%	35	210	35.1	ISO 26262	✓	✓	PG-DSO-16-50
TLE4971-A030W2- S0001	0.5%	30	210	39.8	ISO 26262	✓	✓	PG-DSO-16-50
TLE4971-A020W2- S0001	0.5%	20	210	49.1	ISO 26262	✓	✓	PG-DSO-16-50
TLE4971-A016W2- S0001	0.5%	16	210	60.9	ISO 26262	✓	✓	PG-DSO-16-50

1) over temperature

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