

Product brief

XENSIV™ – TLE4971 magnetic current sensor in TISON-8-5 package

High precision coreless sensor for automotive applications

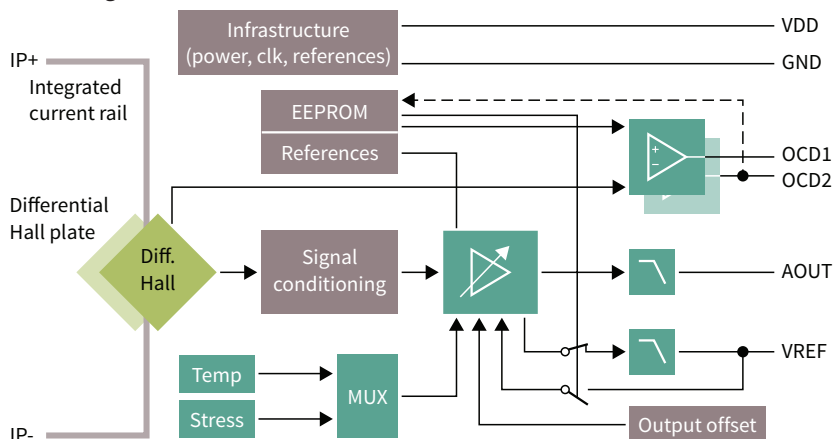
The TLE4971 is a high precision current sensor for bi-directional AC and DC measurements. The device has an analog interface and two fast overcurrent detection outputs which support protection of the power circuitry. Galvanic isolation is provided due to magnetic sensing principle.

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 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.

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 requirements.

Block diagram



Key features

- > Measurement up to 70 A_{RMS} at 690 V_{RMS} within ±120 A FSR
- > Error < 2 percent
- > Current rail resistance specified at 220 μΩ typical and inductance of less than 1 nH
- > 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

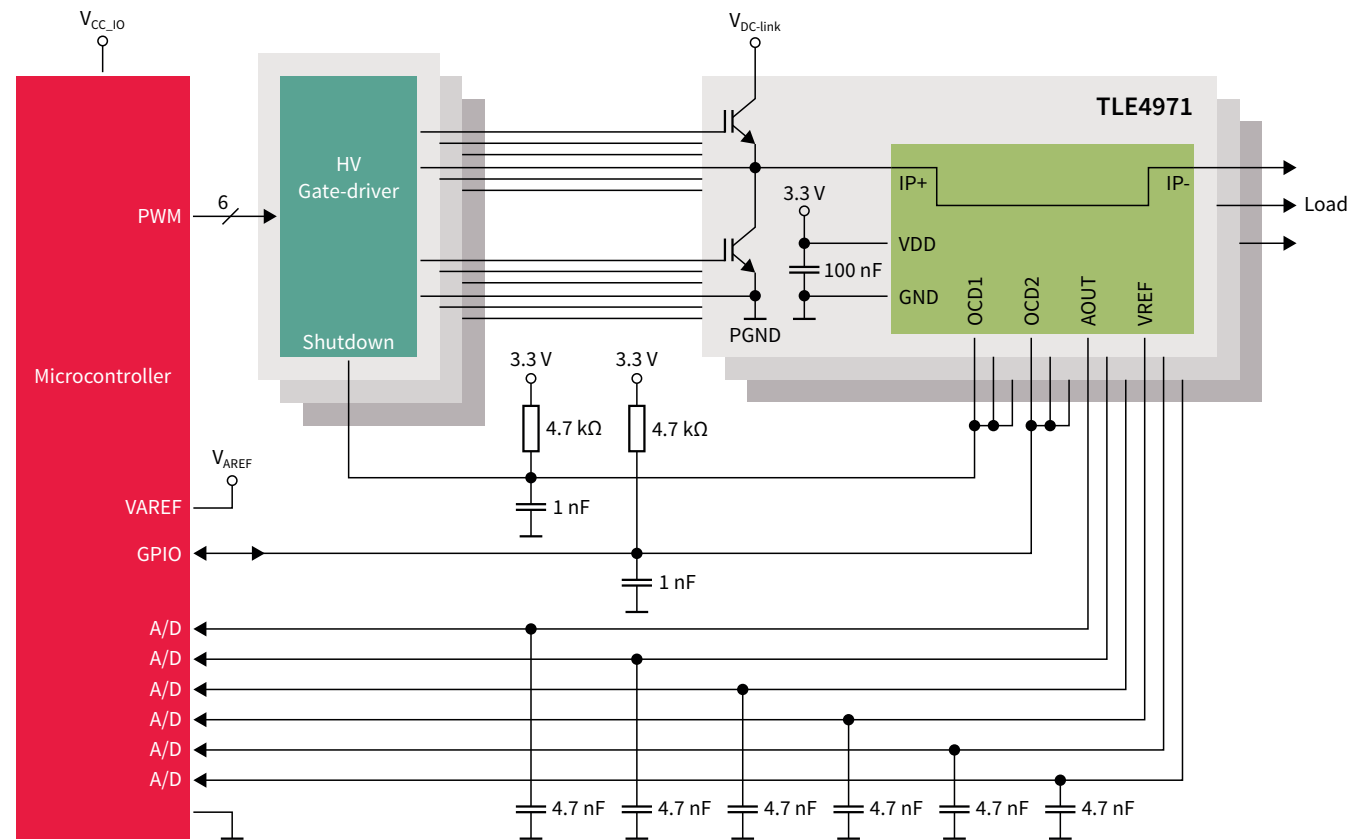
- > Ultra-low power loss due to minimal resistance of current rail
- > Reliable current measurement over lifetime (no re-calibration)
- > Functional isolation for high-voltage application
- > Easy and compact package allows high power density design

Key applications

- > Electric drives up to 690 V_{RMS}
- > Industrial inverters
- > On-Board Chargers (OBC)
- > Photovoltaic inverters, e.g. primary stage of PV inverter
- > Optional power supplies, battery management and overload detection



Application diagram



Application circuit for three phase system in differential configuration

Product table

Product	Error [%]	Current range [A]	Bandwidth [kHz]	Sensitivity [mV/A]	Certification	Automotive	Industrial	Package
TLE4971-A025N5-U-E0001	< 2	25	210	48	UL	✓	✓	PG-TISON-8-5
TLE4971-A025N5-E0001	< 2	25	210	48	–	✓	✓	PG-TISON-8-5
TLE4971-A050N5-U-E0001	< 2	50	210	24	UL	✓	✓	PG-TISON-8-5
TLE4971-A050N5-E0001	< 2	50	210	24	–	✓	✓	PG-TISON-8-5
TLE4971-A075N5-U-E0001	< 2	75	210	16	UL	✓	✓	PG-TISON-8-5
TLE4971-A075N5-E0001	< 2	75	210	16	–	✓	✓	PG-TISON-8-5
TLE4971-A120N5-U-E0001	< 2	120	210	10	UL	✓	✓	PG-TISON-8-5
TLE4971-A120N5-E0001	< 2	120	210	10	–	✓	✓	PG-TISON-8-5



www.infineon.com

Published by
Infineon Technologies AG
Am Campeon 1-15, 85579 Neubiberg
Germany

© 2022 Infineon Technologies AG
All rights reserved.

Date: 08 / 2022

Please note!

This Document is for information purposes only and any information given herein shall in no event be regarded as a warranty, guarantee or description of any functionality, conditions and/or quality of our products or any suitability for a particular purpose. With regard to the technical specifications of our products, we kindly ask you to refer to the relevant product data sheets provided by us. Our customers and their technical departments are required to evaluate the suitability of our products for the intended application.

We reserve the right to change this document and/or the information given herein at any time.

Additional information

For further information on technologies, our products, the application of our products, delivery terms and conditions and/or prices, please contact your nearest Infineon Technologies office (www.infineon.com).

Warnings

Due to technical requirements, our products may contain dangerous substances. For information on the types in question, please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by us in a written document signed by authorized representatives of Infineon Technologies, our products may not be used in any life-endangering applications, including but not limited to medical, nuclear, military, life-critical or any other applications where a failure of the product or any consequences of the use thereof can result in personal injury.