

Product brief

XENSIV™ – TLI4971 magnetic current sensor

High precision coreless sensor for industrial applications

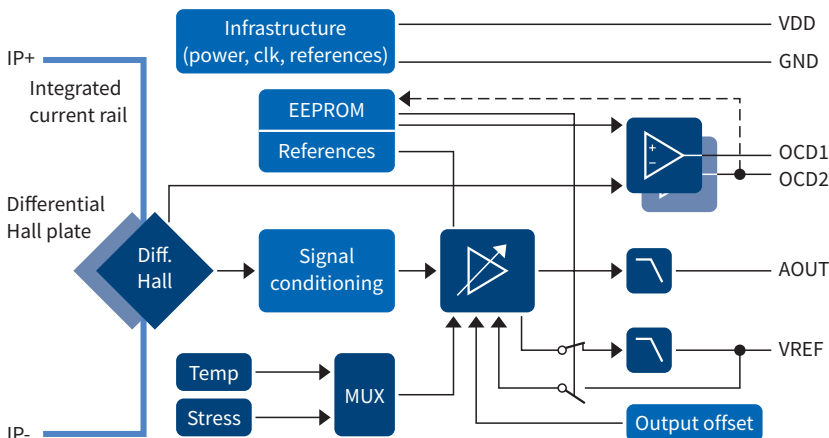
The TLI4971 is a high precision current sensor for bi-directional AC and DC measurements. The device has an analog interface and two fast overcurrent detection outputs which support protection of the power circuitry. Galvanic isolation is provided due to magnetic sensing principle.

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
- > Typical error at 25°C < 2 percent
- > Current rail resistance specified at 225 μΩ typical
- > Analog output signal (with typ. 240 kHz) bandwidth
- > Fast overcurrent detection up to 2 x I_{FSR} (typ. response time 0.7 μs)

Key benefits

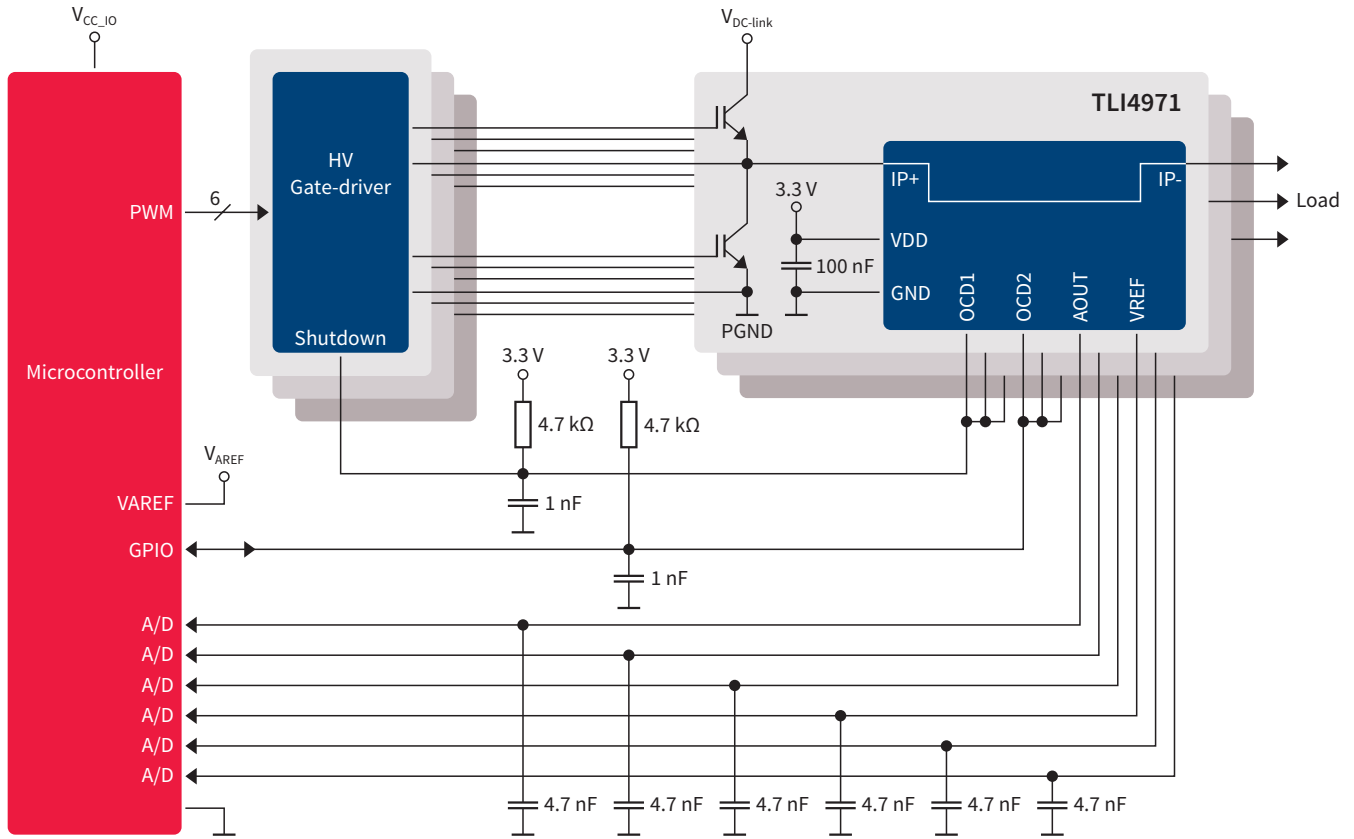
- > Ultra-low power loss due to minimal resistance of current rail
- > Reliable current measurement over lifetime (no re-calibration)
- > Functional isolation for high-voltage application
- > Easy and compact package allows high power density design

Key applications

- > Electric drives up to 690 V_{rms}
- > Industrial inverters
- > 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 | Accuracy ¹⁾ [%] | Current range [A] | Bandwidth typ. [kHz] | Sensitivity [mV/A] | Certification | Industrial | Package |
|--------------------------------------|----------------------------|-------------------|----------------------|--------------------|---------------|------------|---------|
| TLI4971-A120T5-U-E0001 | 3.45 | 120 | 240 | 10 | UL | ● | TISON-8 |
| TLI4971-A120T5-E0001 | 3.45 | 120 | 240 | 10 | - | ● | TISON-8 |
| TLI4971-A025T5-U-E0001 ²⁾ | 3.45 | 25 | 240 | 48 | UL | ● | TISON-8 |
| TLI4971-A025T5-E0001 ²⁾ | 3.45 | 25 | 240 | 48 | - | ● | TISON-8 |
| TLI4971-A050T5-U-E0001 ²⁾ | 3.45 | 50 | 240 | 24 | UL | ● | TISON-8 |
| TLI4971-A050T5-E0001 ²⁾ | 3.45 | 50 | 240 | 24 | - | ● | TISON-8 |
| TLI4971-A075T5-U-E0001 ²⁾ | 3.45 | 75 | 240 | 16 | UL | ● | TISON-8 |
| TLI4971-A075T5-E0001 ²⁾ | 3.45 | 75 | 240 | 16 | - | ● | TISON-8 |

1) Total error over lifetime and temperature

2) Available Q1/2021

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