TSC1214

Digital current sensing AFE, with I²C bus interface

MiniSO8

TSC1214

Maturity status link
TSC1214

Features

- 14-bit ADC for current sensing and ±80 mV range
- 11-bit ADC for temperature
- 2.7 V to 5.5 V power supply voltage
- Low-side and bidirectional current sensing
- Internal die temperature monitoring
- I²C digital interface for device control
- Internal 32768 Hz time base
- Operating free air temperature range: -40 °C to +85 °C

Applications

- Low voltage power supply monitoring
- Servers
- Personal computers

Description

The TSC1214 is a current and temperature monitoring Analog Front End (AFE). It implements a double ADC-path for current based on a 14-bit ADC converter, and for temperature based on an 11-bit ADC. The device is programmable through the I²C interface.

The TSC1214 comes in a plastic MiniSO8 package and can operate from -40 °C to +85 °C ambient temperature.

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For further information contact your local STMicroelectronics sales office.

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1 Block diagram and pin description

Figure 1. Pin connections (top view)
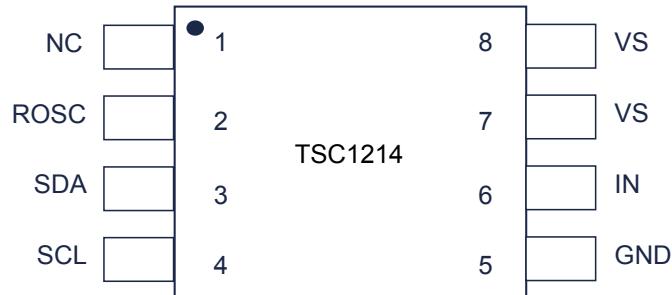

Figure 2. Typical application schematic using TSC1214

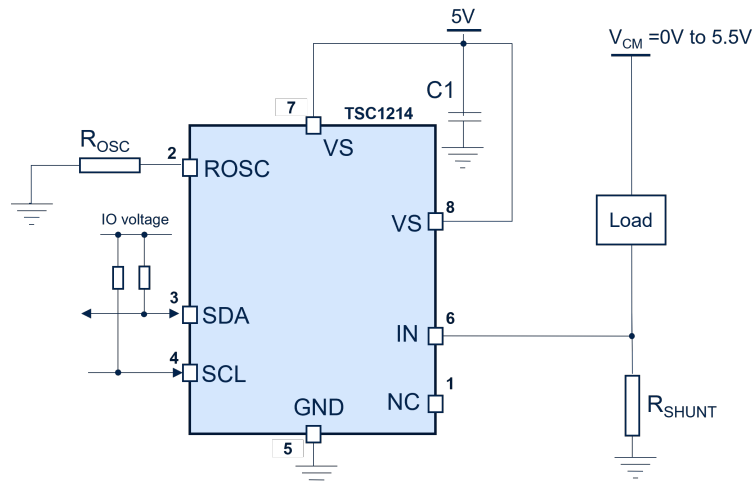Table 1. External components list

Name	Value	Tolerance	Comments
R_{SHUNT}	10 mΩ to 50 mΩ	1%	Shunt resistor to sense the current
R_{OSC}	200 kΩ	0.1%	Internal oscillator bias resistor
C1	1 µF		Supply decoupling capacitance

The TSC1214 is a current and temperature digital monitor. The low-side bidirectional current is measured through a shunt resistor placed between the IN pad and the ground. The current sensing 14-bit ADC has a 500 ms conversion time. The ADC output is in two's complement format. When a conversion cycle is completed, each value is stored in the two 8-bit REG_CURRENT registers and is read by the controller. The registers are updated at the end of each conversion.

The chip temperature (close to the load temperature) is measured by means of an 11-bit ADC. This feature takes place concurrently with the current sensing via a dedicated A/D converter, which means that it does not affect the performance of the current sensing. To reduce power consumption, a conversion takes place only every two seconds.

The conversion cycle time is 250 ms. The resolution is 0.125 °C for the temperature.

Revision history

Table 2. Document revision history

Date	Version	Changes
30-Oct-2023	1	Initial release.

IMPORTANT NOTICE – READ CAREFULLY