HAL 1821/1822/1823

July/2009

HAL® 1821/1822/1823
Linear Hall-Effect Sensor Family

The HAL 1821/1822/1823 are new members of the linear Hall-effect sensor family HAL 182x, offering excellent performance/price trade-off. They are universal magnetic field sensors with a ratiometric, linear analog output. The members of the sensor family can be used for magnetic field measurements, current measurements and detection of any mechanical movement. Very accurate angle measurements or distance measurements can also be carried out. The sensors are very robust and can be used in harsh electrical and mechanical environments.

The output voltage is proportional to the magnetic flux density through the Hall plate. The choppered offset compensation leads to stable magnetic characteristics over supply voltage and temperature.

The different family members vary by sensitivity (25 mV/mT, 31.25 mV/mT and 50 mV/mT). The quiescent output voltage (offset) for all family members is 50% of the supply voltage.

The sensors are designed for industrial and automotive applications and operate in the junction temperature range from –40 °C up to 170 °C.

They are available in the very small leaded package TO92UA and in the small SMD package SOT89B.

Features

- Linear Hall-effect sensor with ratiometric analog output
- Temperature and stress stable quiescent output voltage
- Very accurate sensitivity and offset
- Customized versions possible
- On-chip temperature compensation
- Active offset compensation
- Operates from –40 °C up to 170 °C junction temperature
- Operates from 4.5 V up to 5.5 V supply voltage
- Operates with static magnetic fields and dynamic magnetic fields up to 1 kHz
- Overvoltage and reverse-voltage protection on V_{DD} pin
- Magnetic characteristics are extremely robust against mechanical stress.
- Short-circuit protected push-pull output
- EMC and ESD optimized design

Major Applications

- Due to the sensor's versatile programming characteristics and its high accuracy, the HAL 1821/1822/1823 is the optimal system solution for applications such as:
  - Linear position measurements
  - Angle sensors
  - Distance measurements
  - Current measurements
  - Magnetic field measurements

Family Overview

Type	Offset	Sensitivity
1821	50% of V_{DD}	50 mV/mT
1822	50% of V_{DD}	31.25 mV/mT
1823	50% of V_{DD}	25 mV/mT

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System Architecture

The HAL 1821/1822/1823 sensors are produced in a proven submicron CMOS technology.

The HAL 1821/1822/1823 feature a temperature-compensated Hall plate with choppered offset compensation, an A/D converter, digital signal processing, an analog output and protection devices on all pins.

The internal digital signal processing is a great benefit because analog offsets, temperature shifts, and mechanical stress do not degrade the sensor accuracy.

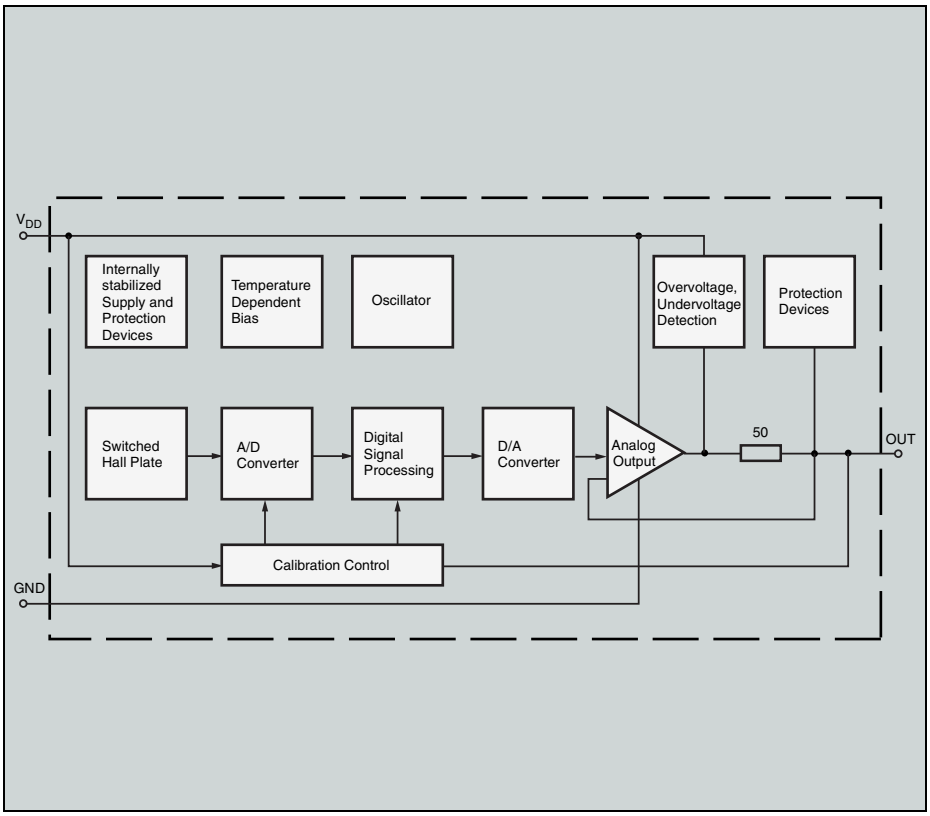

Fig. 1: Block diagram of the HAL 1821/1822/1823

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