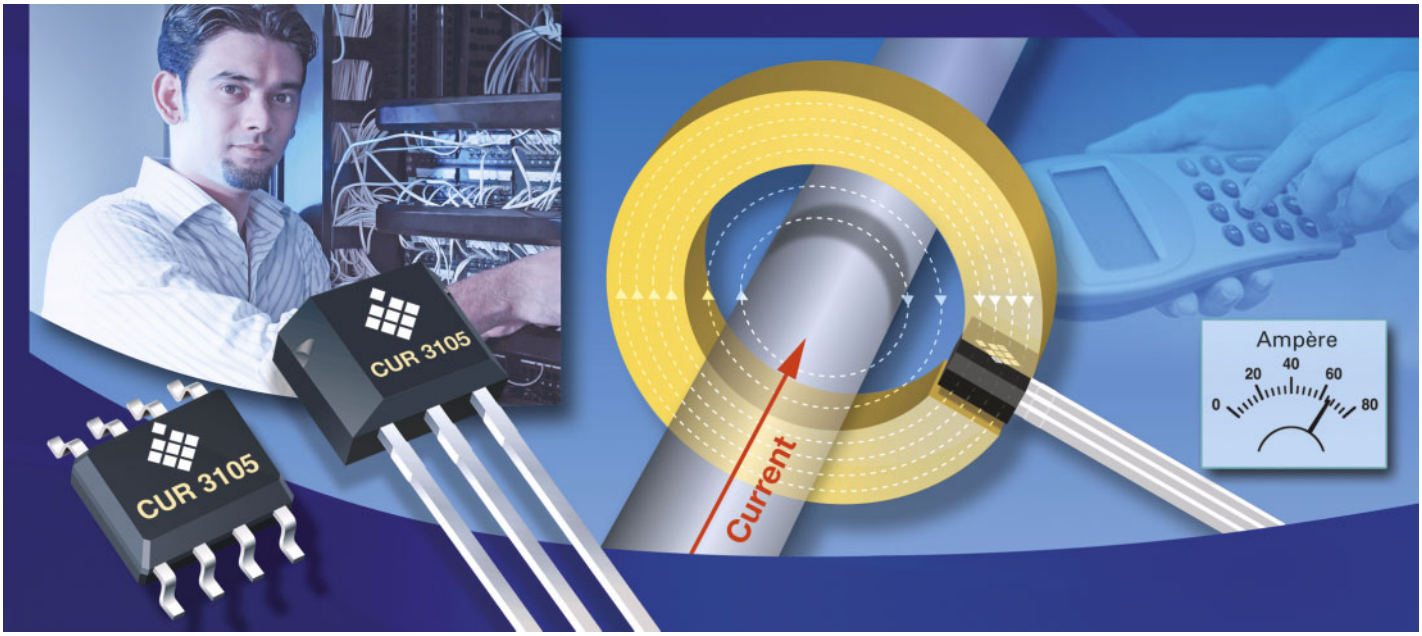
CUR 3105

May/2010



CUR 3105
Hall-Effect Current Transducer

The CUR 3105 is a current transducer based on the Hall effect. The IC can be used for very precise current measurements. The output voltage is proportional to the measured current and the supply voltage (ratiometric analog output). Major characteristics, such as magnetic field range, sensitivity, output quiescent voltage (output voltage at B=0 mT), and output voltage range are programmable and are stored in the internal EEPROM. It is possible to program different transducers which are in parallel to the same supply voltage individually.

The CUR 3105 features a temperature-compensated Hall plate with chopped offset compensation, an A/D converter, digital signal processing, a D/A converter with output driver, an EEPROM memory with redundancy and lock function for the calibration data, an EEPROM for customer serial number, a serial programming interface, and protection devices at all pins. The internal digital signal processing is of great benefit because analog offsets, temperature shifts, and mechanical stress do not degrade the transducers accuracy.

The CUR 3105 is programmable by modulating the supply voltage. No additional programming pin is needed. The easy programmability allows a 2-point calibration by adjusting the output voltage directly to the input signal (current). Individual adjustment of each transducer during the customer's manufacturing process is possible. With this calibration procedure, the tolerances of the IC and the mechanical positioning can be compensated in the final assembly.

The calculation of the individual IC characteristics and the programming of the EEPROM memory can easily be done with a PC and the application kit from Micronas.

The transducer is designed for industrial, white goods and automotive applications and operates with typically 5 V supply voltage in the wide junction temperature range from –40 °C up to 170 °C. The CUR 3105 is available in the very small leaded package TO92UT and the SMD package SOIC8.

Features

- High-precision current transducer with ratiometric output and digital signal processing
- Low output voltage drifts over temperature
- 12-bit analog output
- Multiple programmable magnetic characteristics in a non-volatile memory (EEPROM) with redundancy and lock function
- Open-circuit (ground and supply line break detection) with 5 kΩ pull-up and pull-down resistor, overvoltage and undervoltage detection
- For programming an individual transducer within several ICs in parallel to the same supply voltage, a selection can be done via the output pin
- Programmable clamping function
- Programming through modulation of the supply voltage
- Operates from –40 °C up to 170 °C junction temperature
- Operates from 4.5 V up to 5.5 V supply voltage in specification and functions up to 8.5 V
- Operates with static magnetic fields and dynamic magnetic fields up to 1 kHz
- Overvoltage and reverse-voltage protection at all pins
- Magnetic characteristics extremely robust against mechanical stress
- Short-circuit protected push-pull output
- EMC and ESD optimized design

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Development Tools

For engineering and production purposes, Micronas offers an easy-to-use application kit:

- Micronas Programmer Board V 5.1
- Visual Basic® programming software for Windows® 9x/2000/XP/Vista/7

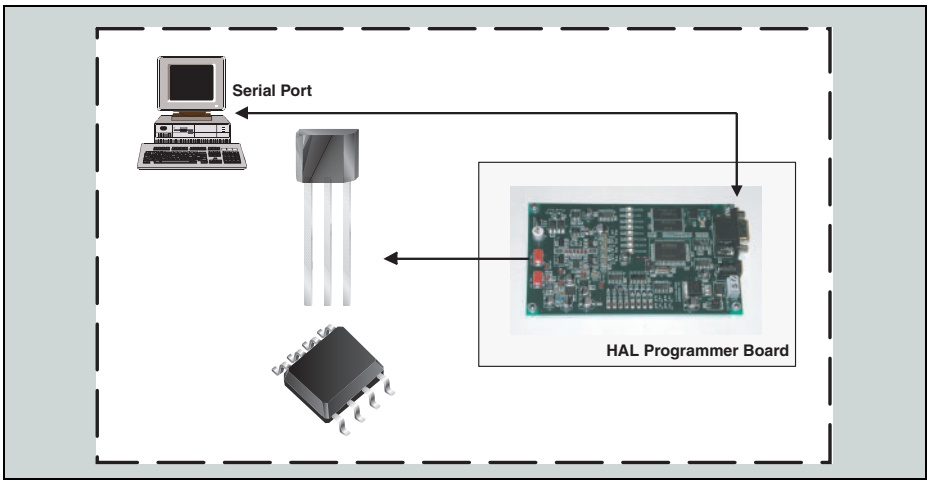

Fig. 1: Development tool setup

System Architecture

The CUR 3105 transducer is produced in a proven submicron CMOS technology.

The CUR 3105 features a temperature-compensated Hall plate with choppered offset compensation, an A/D converter, digital signal processing, an analog output, an EEPROM with redundancy and lock function for the calibration data and the data register information, a serial interface for programming the EEPROM, and protection devices on all pins.

The CUR 3105 is programmable by modulating the supply voltage. No additional programming pin is needed.

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

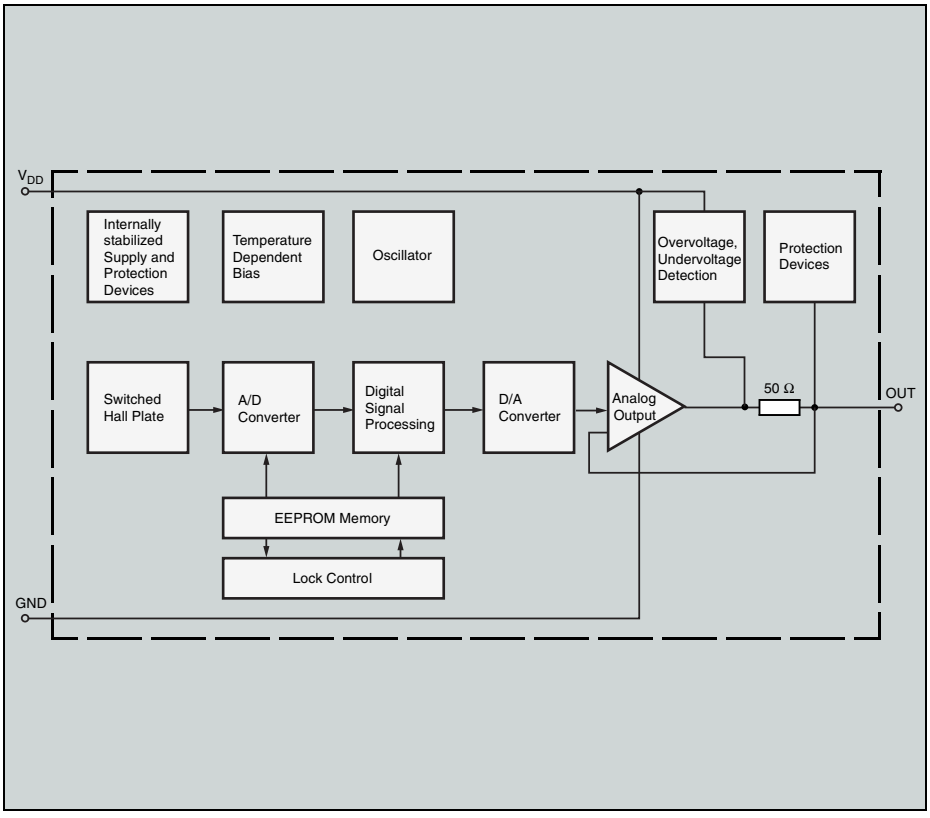

Fig. 2: Block diagram of the CUR 3105

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