

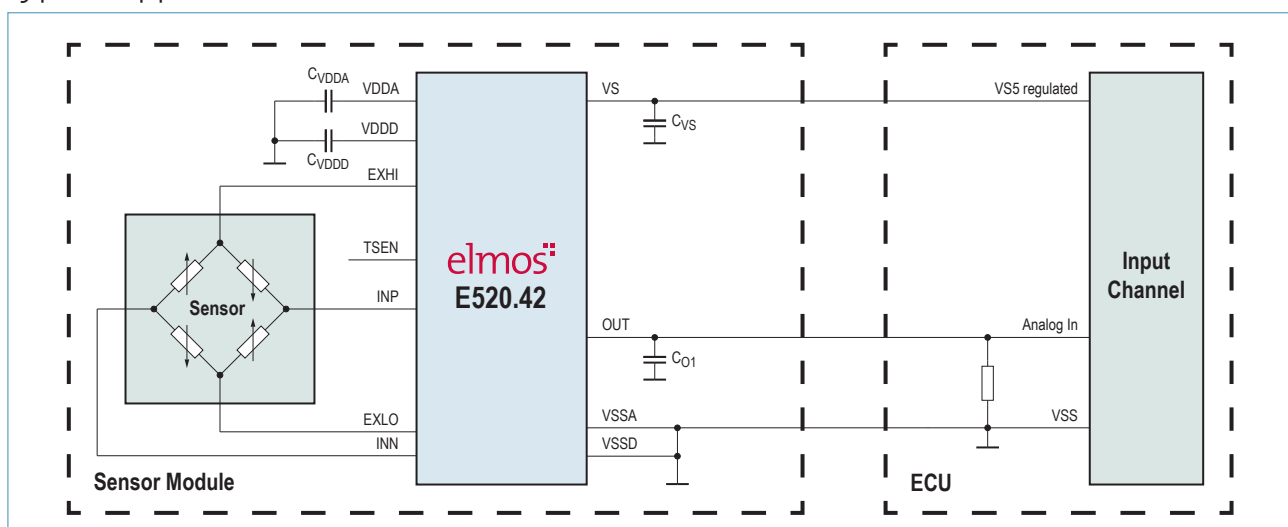
Features

- Optimized to handle nearly any type of resistive sensor bridges without external trim components
- Compensation of minimum 200 mV sensor offset independently from signal range
- Configurable input signal range with 16-step coarse analogue gain trimming; full scale span: 3..300mVpp
- Analogue gain up to 715
- Low noise input amplifier and 14-bit ADC for high resolution sensor signal acquisition
- Configurable digital low pass filter (0.13..4.7 kHz) allows excellent SNR at smallest input span
- Precise compensation of sensor nonlinearity and thermal drift in sensor span and offset up to 3rd order
- Temperature acquisition by internal sensor or external sensor diode
- Configurable output for
- Ratiometric voltage output through 12-bit DAC, or
- SENT mode (acc. SAE J2716, JAN2010)
- 40V Over-voltage (OVP) and -28V reverse voltage protections (RVP)
- Single-wire programming interface supports 3-wire sensor assembly and end-of-line calibration
- Wide range of diagnostic functions monitoring sensor and IC surveillance
- Wide operating temperature range: -40 to +150°C
- Automotive qualification according to AEC-Q100

Applications

- Resistive Bridge Sensors
- Pressure, Strain, Torque, Force

Typical Application Circuit



General Description

The IC E520.42 is a sensor signal processor (SSP) designed to amplify and treat the signal of resistive bridges. It comprises wide programming range and comprehensive diagnostic features.

A low-noise instrumentation amplifier with gain and off-set tuning capability amplifies the input signal to a level which fits the input range of a 14-bit delta-sigma AD-converter.

After low-pass filtering the digitized input is compensated for thermal drifts of offset and gain in the digital domain.

A temperature signal from an on-chip sensor or an external T-sensor is digitized and fed to the compensation calculator, too. The correction engine can compensate non-linearity in the signal to 3rd order. The digital output from the calculator engine is fed into a DA-converter driving an analogue voltage buffer providing a ratiometric output signal.

Alternatively, a digital SENT output can be used instead of the analogue output. In configuration mode or diagnostic mode the output pin is used as a single-wire serial data interface for in-sys-tem calibration with only 3 wires to the outside.

Calibration and configuration data for a specific sensor are stored in EEPROM. The IC includes self-test and diagnostics routines for the sensor bridge attached and the SSP itself. If faults occurs, they are indicated at the out-put as distinctive failure states.

Ordering Information

Ordering-No.:	Temp Range	Package
E52042A52C	-40°C to +150°C	QFN20L4
E52042A24Y	-40°C to +150°C	Bare Die (Wafer BS)

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