BRIEF

XENSIV™ - KP465

Air pressure sensor

KP465 air pressure sensor for fuel-cell systems and industry application

Fuel-cell systems as energy source still represent a comparatively small share in the overall automotive sector. Main reasons are the high system costs, hydrogen infrastructure limitations, and the open efficiency challenges in hydrogen production and distribution. Nevertheless, fuel-cell systems have a high growth potential in the automotive sector, especially for commercial vehicles on their way to zero emissions transportation.

A fuel-cell system always contains a hydrogen and an air side, where the hydrogen and the oxygen react inside the fuel-cell stack and generate energy that charges the traction battery. For maximized system efficiency, both sides, hydrogen and air are pressurized. For the hydrogen side the high storage pressure is reduced to the desired system pressure. For the air side a compressor is used to increase the pressure from ambient level. For optimized and closed-loop compressor control pressure sensors are located before and after the compressor.

The Infineon XENSIV™ air pressure sensor KP465, which has a measuring range of 60 to 320 kPa, is well suited for this application and the location after the air compressor with a typical system pressure maximum 3 bar. On the ambient pressure position, the KP464 - with a pressure range of 40 to 115 kPa - is a good fit.

Another possible use of the KP465 sensor is in industrial applications where higher pressures levels are of interest. Examples are industrial systems for monitoring air conditions, such as overpressures in factory buildings, and smart gas metering.

The KP46x family provides SPI interface, designed for direct connection to host microcontroller, while minimizing the bill of materials. The SPI interface offers high flexibility with a wide range of functions for sensor operation and diagnosis. The users can select between 10, 12, or 14-bit resolution within the same device.

Key features

- High accuracy pressure sensing of ±3 kPa
- Integrated temperature sensor
- Pressure range from 60 to 320 kPa
- Wide operating temperature range from -40 to 125°C
- Low current consumption of 3.5 mA
- Digital SPI interface
- Up to 14-bit pressure and temperature resolution
- Calibrated and compensated
- Self-diagnosis features
- Fast startup time of less than 5 ms
- Green, very small 8-pin DFN package

The KP465 is individually calibrated and temperature compensated. It offers a fast startup time of less than 5 ms and a high accuracy of up to 3 kPa. Additionally, the KP46x sensors operate effectively within a wide temperature range of -40 to +125°C and offer high ESD robustness, and excellent EMC performance. The KP46x sensors are automotive qualified, making them an ideal choice in challenging environmental conditions, for both Automotive and Industrial applications.

The “green” 8-pin DFN package with a very small body size of 4.5 x 4.3 x 1.8 mm^3, safeguarded by a protective 5-hole lid designed to avoid particle intrusion. The KP46x sensors contribute to save energy to the customer systems with a low current consumption of 3.5 mA.

The KP465 is fully compatible with Infineon’s previous generation of barometric pressure sensors, ensuring seamless communication and pinning for minimum integration effort.



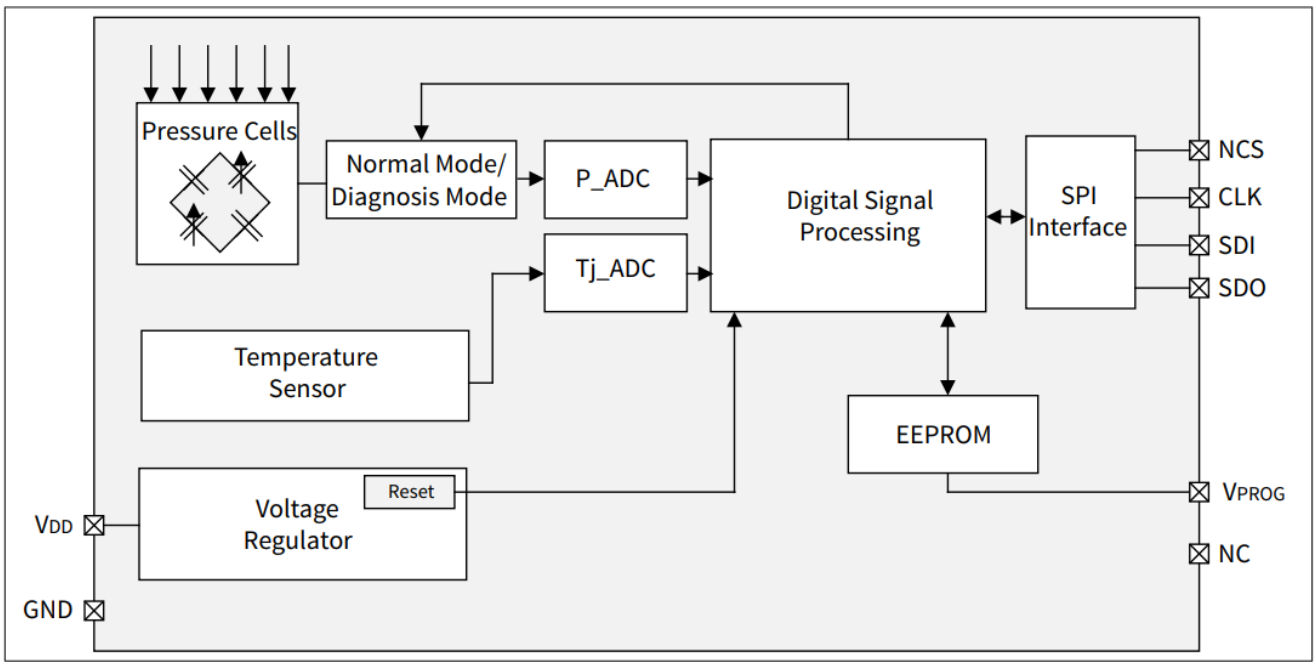
Key benefits

- Fuel-cell control unit (FCCU)
- Fuel-cell electric air compressor
- Allows to reduce power budget to maximize system efficiency
- Robust sensor failure detection
- Minimized design efforts by re-using existing software and PCB layout

Key applications:

- Fuel-cell control unit (FCCU)
- Fuel-cell electric air compressor
- Allows to reduce power budget to maximize system efficiency
- Robust sensor failure detection

Block diagram KP465



Product details

Product name	Interface	Pressure range [kPa]	Temperature range [°C]	Pressure accuracy [kPa]	Application	Ordering Code	Package
KP465	Digital SPI	60 … 320	-40 … +125	+/-3	ATV Powertrain, H2, Industry	SP005430040	PG-DFN-8-1

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