

Product brief

DPS422

Digital barometric pressure and temperature sensor

The DPS422 is a miniaturized digital barometric air pressure sensor with a high accuracy level and low current consumption. DPS422 is both a pressure and temperature sensor and is sealed with a metal lid. The pressure sensor element is based on a capacitive principle which guarantees high precision during temperature changes. Additionally, self-diagnostic features and an intelligent FIFO principle are implemented. The small form factor and package height make the DPS422 ideal for mobile applications and wearable devices.

The DPS422's internal signal processor converts the output from the pressure and temperature sensor elements to 24-bit results. Each pressure sensor has been calibrated individually and contains calibration coefficients. The coefficients are used in the application to convert the measurement results to true pressure and temperature values.

The sensor has a FIFO that can store the latest 32 measurements. Since the host processor can remain in a sleep mode for a longer period between readouts, a FIFO can reduce the system power consumption. Sensor measurements and calibration coefficients are available via the serial I²C/SPI interface.

Typical applications

- > Local weather station and thermostats
 - Micro weather forecasting; wind speed measurement; room temperature control
- > Air flow control
 - Smart filter replacement alarm, e.g. in whitegoods; servers CPU ventilation control
- > Health and sports
 - Accurate elevation gain and vertical speed detection (e.g. for smart watches)
- > Outdoor navigation
 - GPS start-up time and accuracy improvement; dead-reckoning e.g. in tunnels
- > Indoor navigation
 - Floor detection e.g. in shopping malls and parking garages
- > Smart home
 - Intruder detection and environmental monitoring of premises



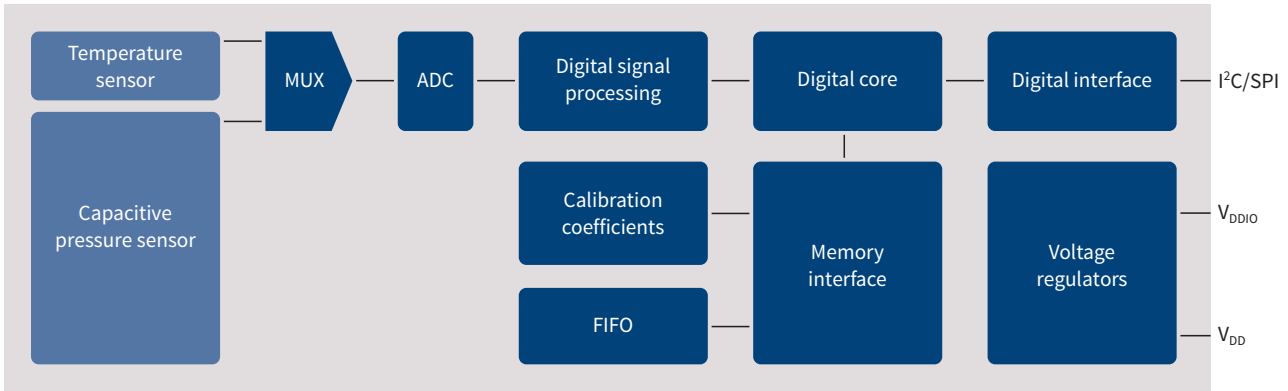
Key features

- > Operation range
 - Pressure: 300 ... 1200 hPa
 - Temperature: -40 ... 85°C
- > Pressure level precision
 - ±0.005 hPa (or ±5 cm) (high-precision mode)
- > Pressure sensor relative accuracy
 - ±0.06 hPa (or ±0.5 m)
- > Temperature accuracy
 - ±0.4°C
- > Pressure temperature sensitivity
 - < 0.5 Pa/K
- > Measurement time
 - Low-power mode: 3 ms
- > Average current consumption
 - 1.7 µA for pressure measurement (1 measurement/sec.)
 - Standby: < 1 µA
- > Supply voltage
 - V_{DDIO}: 1.2 – 3.6 V
 - V_{DD}: 1.7 – 3.6 V
- > Operating modes
 - Command (manual)
 - Background (automatic)
 - Standby
- > Interface
 - I²C and SPI (both with optional interrupt)
- > Package dimensions
 - 8-pin LGA
 - 2.0 x 2.5 x 0.73 mm

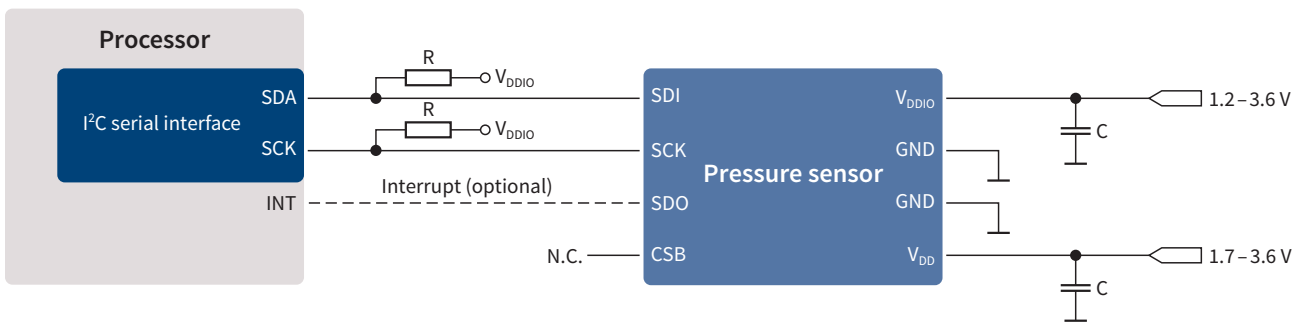
Pressure sensor for mobile devices

Digital barometric air pressure sensor

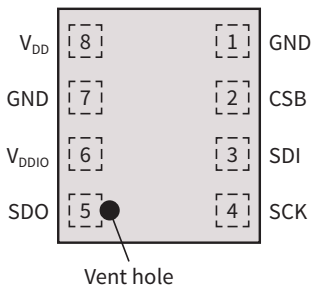
Functional block diagram



Application circuit example (in I²C configuration)



Pin configuration (Top view)



Pin	Name	Function
1	GND	Ground
2	CSB	Chip select
3	SDI	Serial data in/out
4	SCK	Serial clock
5	SDO	Serial data out
6	V _{DDIO}	Digital interface supply
7	GND	Ground
8	V _{DD}	Analog supply

Orderable part number: DPS422XTSA1

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