Product Brief

# DPS310 digital barometric pressure sensor for mobile and wearable devices

## Description

The DPS310 is a miniaturized Digital Barometric Air Pressure Sensor with a high accuracy level and low current consumption. The DPS310 is both a pressure and temperature sensor. The pressure sensor element is based on a capacitive principle which guarantees high precision during temperature changes. The small package makes the DPS310 ideal for mobile applications and wearable devices.

The DPS310'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

› Indoor navigation
  – Floor detection e.g. in shopping malls and parking garages
› Health and sports
  – Accurate elevation gain and vertical speed
› Outdoor navigation
  – GPS start-up time and accuracy improvement
  – Dead-reckoning e.g. in tunnels
› Local weather station

## Key features

› Operation range
  – Pressure: 300 … 1200 hPa
  – Temperature: -40 … 85°C
› Pressure level precision
  – ±0.006 hPa (or ±5 cm)
    (high-precision mode)
› Pressure sensor relative accuracy
  – ±0.06 hPa (or ±0.5 m)
› Temperature accuracy
  – ±0.5°C
› Pressure temperature sensitivity
  – < 0.5 Pa/K
› Measurement time
  – Low-power mode: 3 ms
› Average current consumption
  – Low power: 3 µA
    (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
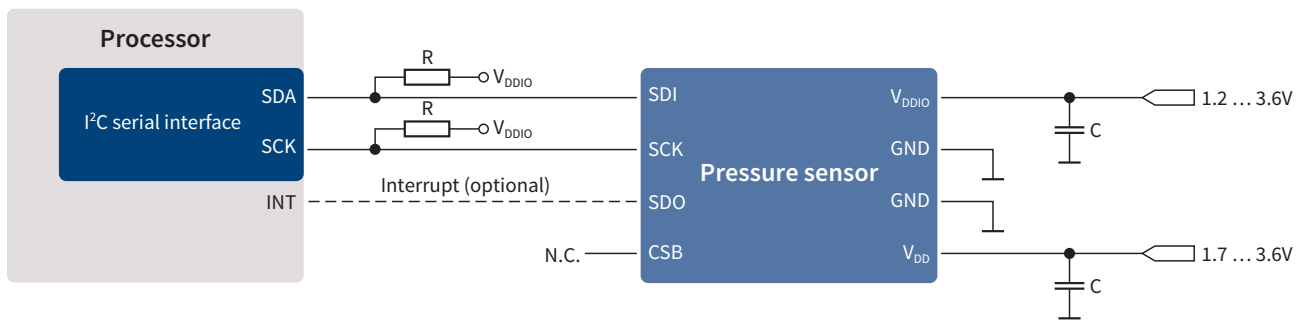  – 8-pin LGA
  – 2.0 x 2.5 x 1.0 mm

# Pressure sensor for mobile devices
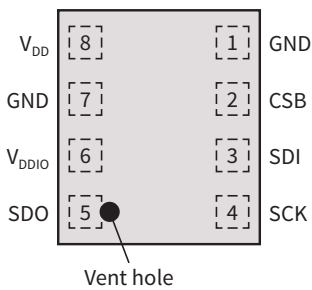
## Digital barometric air pressure sensor

## Functional block diagram
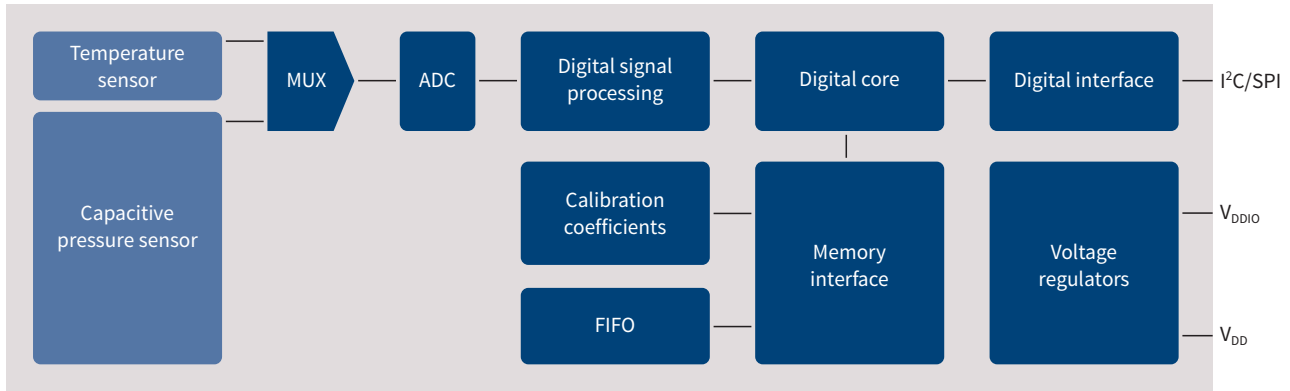


## Application circuit example (in I²C configuration)



## Pin configuration (Top view)



Vent hole

| 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 |

**Order Number: B132-I0080-V2-7600-EU-EC-P**
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**Additional information**
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