

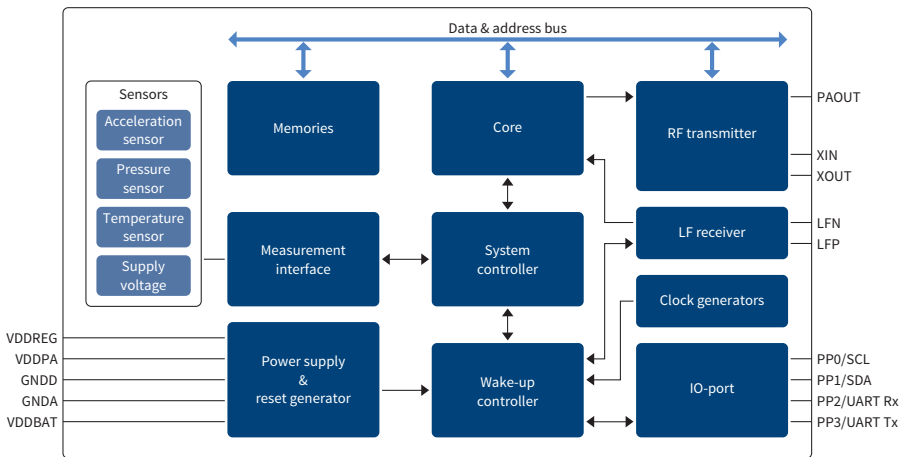
Product brief

XENSIV™ – SP40+

Tire Pressure Monitoring Sensors (TPMS)

The Infineon SP40+ product family provides highly integrated devices which perform all functions for a wheel module of a Tire Pressure Monitoring System (TPMS) suited for high-volume applications. The devices measure pressure in the range from 100 kPa up to 1400 kPa and acceleration between -355g and 355g as well as temperature and supply voltage. Furthermore, they feature an efficient power management and an integrated microcontroller. An integrated LF receiver and RF transmitter allow wireless communication. For wired data transfer, the hardware I²C and UART interface can be used. Further wired interfaces such as SPI or PWM can be realized in software.

Block diagram SP40+



Customer benefits

Optimized for battery-powered applications, the system controller with flexible wake-up and power management, ultra-low power down current and the wide range of supply voltage ensures a long lasting battery lifetime (for typical TPMS applications 10 years with a CR2032 battery). Together with the possibility to generate a wake-up from the integrated Interval timer, SP40+ products are perfectly suited for standalone remote pressure sensing solutions demanding low charge consumption. For such applications, the LF receiver with wake-up capability and best-in-class sensitivity provides the possibility of on-demand measurements.

Features

- > Absolute pressure sensor from 100 kPa up to 1400 kPa
- > Radial accelerations sensor
- > Temperature sensor
- > Supply voltage sensor
- > Embedded 8-bit microcontroller
- > Up to 14 kB flash for application code
- > 256 byte flash for configuration data
- > 160 B retention RAM
- > 315 and 434 MHz FSK/ASK transmitter
- > 125 kHz ASK high-sensitivity receiver
- > System controller with flexible wake-up and power management
- > Ultra-low power down current
- > Supply voltage range 1.9 to 3.6 V
- > Operating temperature from -40°C to 125°C
- > PG-DSOSP-14-82 package

Applications

- > Tire pressure monitoring
- > Further possible high pressure applications
 - Air suspension
 - Air brake, and more

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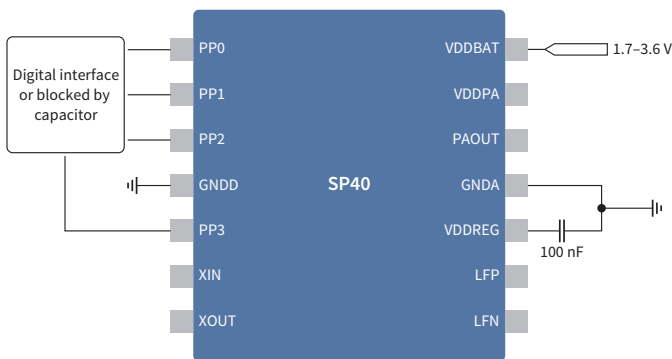
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Wake-ups can also be generated via one of the four GPIOs. These GPIOs can also be used for digital interfaces such as I²C, UART or SPI. Therefore, SP40+ products also provide a flexible low power solution for wired high-pressure sensor applications.

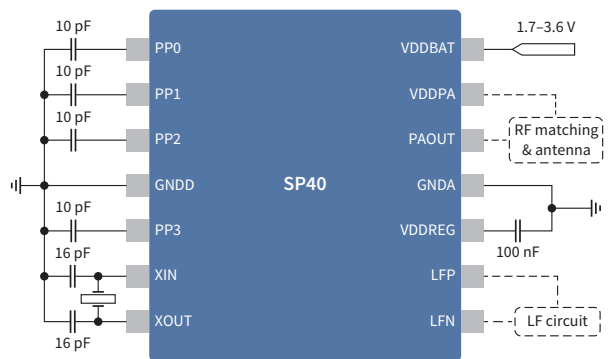
Moreover, having all active components already integrated, only few additional passive components are required to complete an application based on SP40+ products. Thus it offers a truly competitive low-cost solution while still providing high quality. For a wired digital sensing solution providing compensated pressure measurements using the integrated I²C handler based

on the internal pulling resistors, for example, only the external power supply and a few capacitors for voltage stabilization are needed. In case the improved timing capabilities of the SP40+ device is needed on top of that, only a 26 MHz crystal oscillator is necessary. Stepping from a wired solution to a wireless sensor solution using the built-in RF transmitter and LF receiver requires apart from the crystal oscillator just the addition of an LRC oscillator circuit for LF as well as the matching network and antenna for RF.

Minimal application diagram for a wired sensing solution using SP40+



Minimal application diagram for a wireless sensing solution with SP40+ using RF transmission and LF reception



Product table

Product variant	Product name	Pressure range [kPa]	Flash size for code [kB]	Package	Ordering code
SP400-11-01	SP40+	900	12	PG-DSOSP-14-82	SP001605668
SP400-11-11	SP40+ XCS	900	14	PG-DSOSP-14-82	SP001605672
SP400-15-11	SP40Truck	1400	14	PG-DSOSP-14-82	SP003269636

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