

Sensing Solutions—Robust, Reliable Performance

FXTH8715 High Pressure TPMS Family

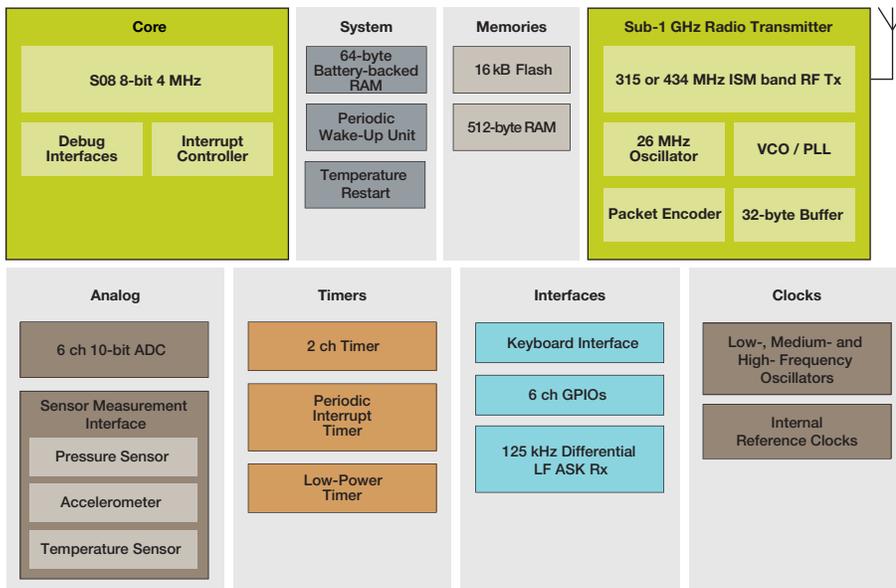
Tire Pressure Monitoring Sensors 100-1500 kPa

Overview

Freescale's FXTH8715 high pressure family of tire pressure monitoring sensors (TPMS) is highly integrated with the smallest 7 x 7 mm package footprint on the market which has a 63% smaller footprint than Freescale's previous-generation of SOIC 20 package developed for truck applications. It also provides the lowest transmitting power consumption (less than 8 mA I_{dd}), largest customer memory size (8 kB) currently available and unique dual-axis accelerometer architecture. Freescale's TPMS solution integrates an 8-bit microcontroller (MCU), pressure sensor, XZ-axis or Z-axis accelerometer and RF transmitter.

Freescale's portfolio with pressure ranges of 100-1500 kPa supports medium and heavy duty trucks, buses and construction vehicles for TPMS markets. These TPMS markets are mainly driven by improved safety and fleet management requirements.

FXTH8715 TPMS Family Block Diagram

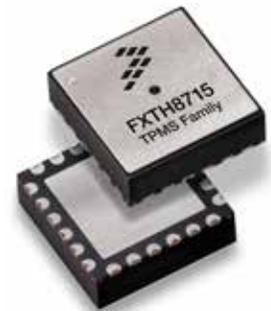


Target Applications

- Tire pressure monitoring systems
- Ultra low-power wireless sensing

Implementations

- Measures pressure typical for heavy duty vehicles (trucks, buses, construction vehicles)
- Measures dual-axis acceleration
- Measures temperature
- Measures battery voltage
- Bi-directional communication



Product Specifications

| Standard Part Number | P-cell Range (kPa) | Pressure Offset Accuracy (0° C to 70° C) | Axis of Acceleration | Z Range Sensitivity | Z-Offset Accuracy (-40° C to +125° C) | X Range | X-Offset Accuracy (-40° C to +125° C) |
|----------------------------------|--------------------|--|----------------------|---------------------------------------|---------------------------------------|-------------------------------------|---------------------------------------|
| Standard Tolerances | | | | | | | |
| FXTH871502DT1 | 100-1500 | ±20 kPa | Z | -270 g/+350 g range, 40 g sensitivity | ±6 g | | |
| FXTH871511DT1 | 100-1500 | ±20 kPa | XZ | -210 g/+240 g range, 60 g sensitivity | ±5 g | -70 g/+80 g range, 10 g sensitivity | ±4 g |
| Precision Tolerances | | | | | | | |
| FXTH8715026T1 | 100-1500 | ±20 kPa | Z | -270 g/+350 g range, 40 g sensitivity | ±3 g | | |
| FXTH8715116T1 | 100-1500 | ±20 kPa | XZ | -210 g/+240 g range, 60 g sensitivity | ±3 g | -70 g/+80 g range, 10 g sensitivity | ±3 g |
| High Precision Tolerances | | | | | | | |
| FXTH8715027T1 | 100-1500 | ±17 kPa | Z | -270 g/+350 g range, 40 g sensitivity | ±3 g | | |
| FXTH8715117T1 | 100-1500 | ±17 kPa | XZ | -210 g/+240 g range, 60 g sensitivity | ±3 g | -70 g/+80 g range, 10 g sensitivity | ±3 g |

Features

- QFN 7 x 7 x 2.2 mm package enables visible solder joint for inspection
- 100–1500 kPa pressure range
- Z-axis or dual XZ-axis accelerometers
- Accelerometer standard or precision tolerances available
- High precision tolerance available for pressure
- Low-power wake-up timer and periodic reset driven by LFO
- Dedicated state machines for reduced power consumption
- 8-bit MCU/S08 core with SIM, interrupt and debug/monitor
- 512 Bytes RAM / 16 k Flash (8 k for Freescale library, 8 k for applications)
- Internal 315/434 MHz RF transmitter
- Internal 125 kHz LF receiver
- Six multipurpose GPIO pins (including two A/D inputs)

Product Longevity Program

These products are/or may be supported by Freescale's Product Longevity Program. For Terms and Conditions and to obtain a list of available products please see:

Freescale.com/productlongevity



Product Longevity



Common Attributes

| | |
|---|-------------------|
| Voltage Measurement Range | 1.8 V to 3.6 V |
| Voltage Resolution (8-bit) | 10 mV / LSB |
| Voltage Accuracy (>2.1 V supply) | ±100 mV |
| Temperature Measurement Range Run Mode | -40 °C to +125 °C |
| Temperature Resolution (8-bit unsigned) | 1 °C / LSB |
| Temperature Offset Accuracy (-20 °C ≤ TA ≤ 70 °C) | ±3 °C |

Product Differentiation

| Features | Benefits |
|---|--|
| Tightest offset pressure accuracy | Enables predictive system implementation |
| Smallest package size | Enables smallest module design for lighter weight and space-constrained applications |
| Dual-axis XZ inertial sensor | Enables easier tire localization capability |
| 8 kB customer memory/capability of interfacing with external memory | Flexibility of software development and time to market |
| Lowest RF power consumption | Longest battery life |
| High production capacity (QFN 7 x 7) | Secured supply and short lead time |

Documentation

| Document Number | Title | Description |
|-----------------|--|------------------|
| FXTH871xD | Tire Pressure Monitor Sensor Standard Tolerance Specification | Data Sheet |
| FXTH871x6 | Tire Pressure Monitor Sensor Precision Tolerance Specification | Data Sheet |
| FXTH871x7 | Tire Pressure Monitor Sensor for High Precision | Data Sheet |
| AN4391 | Using the FXTH87 Family of LF Receivers for TPMS Application | Application Note |
| AN1902 | Assembly Guidelines for QFN and DFN Packages | Application Note |

Freescale: A Leader in Sensing Solutions

Expanding on more than 35 years of sensor innovation, Freescale sensing solutions are designed with the right combination of high-performance sensing capability, processing capacity and customizable software to help deliver smart, differentiated sensing applications. With these sensing solutions, our vision is to offer a diverse and differentiated product portfolio to meet the expanding needs of the automotive, consumer and industrial segments. Freescale sensing solutions offer ideal blends of functionality and intelligence designed to help our customers differentiate and win in highly competitive market.

For more information, visit freescale.com/TPMS and freescale.com/pressure

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