



## SP 37 450kPa Tire Pressure Sensor

**Single Package IC for Tire Pressure Monitoring Systems (TPMS) with Pressure and Acceleration Sensor, embedded 8051 Microcontroller, LF 125 kHz ASK Receiver and FSK/ASK 315/434 MHz Transmitter**

The SP 37 is a highly integrated device which performs all necessary functions of a TPM module in the wheel for high-volume applications. The device contains the sensing element, the microcontroller, the LF receiver and the transmitter in one package.

The Sensor design is based upon Infineon's patented bulk micro-machined sensing technology which allows highly reliable measurements in harsh environments. The SP 37 measures pressure, temperature, supply voltage and radial acceleration. The device is offered with a pressure range of 100–450 kPa.

### Major Functional Blocks of SP 37 Tire Pressure Sensor

- Pressure sensor
- Radial acceleration sensor
- Temperature sensor
- Battery voltage sensor
- 8051 compatible microcontroller
- 6 kByte onchip FLASH memory
- 256 byte RAM
- Advanced power control/wake-up system to minimize battery consumption
- RF transmitter for 315 and 434 MHz
- Selectable output power 5 or 8 dBm
- LF receiver for 125 kHz
- P-DSOSP-14-6 Package

### TPMS System with SP 37

- Integrated FSK&ASK UHF transmitter
- Advanced power control features
- Ultra low standby current ( $<0.7\mu\text{A}$ )
- Supply voltage range 1.9V to 3.6V
- Operating temperature range -40 to +125°C

# SP 37 450kPa

## Tire Pressure Sensor

### Pressure Measurement specification, 100 to 450kPa Pressure Sensor Characteristics (Vbat=2.1...3.6V)

Parameter	Symbol	Limit values		Unit	Test Conditions
		min.	max.		
Inout Range	PRang	100	450	kPa	T=-40...125°C
Measurement Error	P Error	-7	7	kPa	T=0...50°C
Measurement Error	P Error	-9	9	kPa	T=50...70°C
Measurement Error	P Error	-17.5	17.5	kPa	T=-40...125°C

### Acceleration Measurement Characteristics (Vbat=2.1...3.6V)

Parameter	Symbol	Limit Values		Unit	Test Conditions
		min.	max.		
Input Range	ARange	-115	115	g	T=-40...125°C
Sensitivity Accuracy	ASense	-18,75	18,75	%	T=-40...90°C
Sensitivity Accuracy	ASense	-24	24	%	T=90...125°C
Offset Accuracy	Aoffset	-6	6	g	T=-20...70°C
Offset Accuracy	Aoffset	-8,5	8,5	g	T=-40...90°C
Offset Accuracy	Aoffset	-12	12	g	T=90...125°C

### Temperature Measurement Characteristics (Vbat=2.1...3.6V)

Parameter	Symbol	Limit Values		Unit	Test Conditions
		min.	max.		
Measurement Error	T Error	-3	3	°C	T=-20...70°C
Measurement Error	T Error	-5	5	°C	T=-40...125°C

### Supply Voltage Measurements Battery Sensor Characteristics (Vbat=1.9...3.6V)

Parameter	Symbol	Limit Values		Unit	Test Conditions
Measurement Error	V Error	-100	100	mV	T = -40...125°C

How to reach us:  
<http://www.infineon.com>

Published by  
Infineon Technologies AG  
81726 Munich, Germany

© 2009 Infineon Technologies AG  
All Rights Reserved.

**Legal Disclaimer** The information given in this Product Brief shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

**Information** For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office ([www.infineon.com](http://www.infineon.com)).

**Warnings** Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office. Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that health of the user or other persons may be endangered.