BRIEF INFORMATION

77 GHz radar sensor

- → Compact radar sensor developed for the most demanding environments IP 6K7 and IP X9K
- → Wide field of view and long range
- → Stable measuring signal even in adverse environmental conditions and contamination on the sensor cap
- → Fast measurements and response to change of position

PRODUCT FEATURES

Application
Radar sensors are becoming increasingly important in on-highway and off-highway applications. This enables 360° environment detection both of moving objects (such as cars, cyclists and pedestrians) and of stationary objects around the vehicle.

Thanks to a FMCW radar (frequency-modulated continuous wave radar), these 77 GHz sensors detect objects even in extreme weather conditions: rain, snow, fog and extreme temperatures do not impair their function.

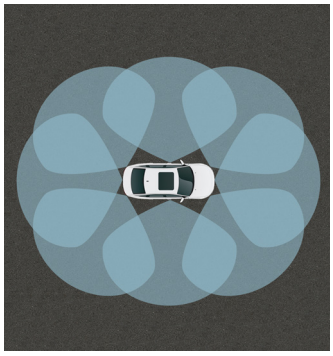
The compact sensor design opens up new integration options, for example in the side of the vehicle. In addition to the distance measurement, the relative velocity of an object can also be measured.

Design and function
The sensor is based on the frequency-modulated continuous wave (FMCW) method. For this, the frequency of a carrier frequency that is continuously emitted by the sensor varies in a small range (the bandwidth). As soon as the signal is reflected back from an object to the sensor, the distance and speed of the detected object can be determined by comparing the frequency.

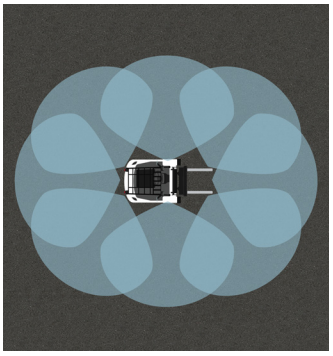
The centrepiece of the sensors is the Radar System Chip, which is based on RF-CMOS technology. The architecture makes it possible to integrate digital components and systems for self-diagnosis on one Radar System Chip, in addition to the components for transmitting and receiving.

77 GHZ RADAR SENSORS

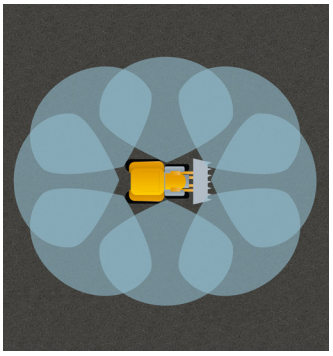
360° environment and object detection as well as blind spot monitoring



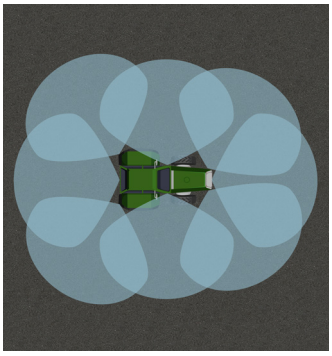
Sports cars and electric vehicles



Forklifts



Construction vehicles



Agricultural machinery

FUNCTIONAL DIAGRAM

Radar sensor

Radar sensor

Radar sensor

Bus system

Control unit

Bus system

Warning signal

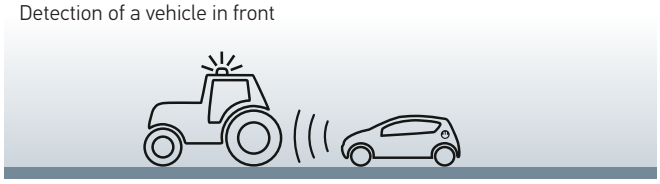
Acoustic signal

Active brake intervention or acceleration avoidance

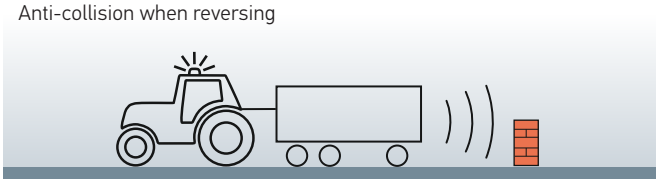
Display

APPLICATION EXAMPLES

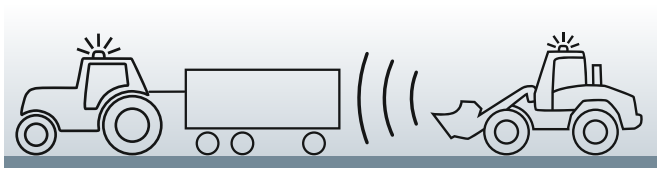
Detection of a vehicle in front



Anti-collision when reversing

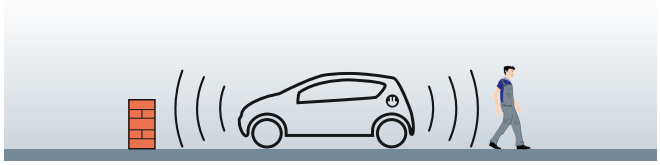


Maintaining a certain distance
from the vehicle in front



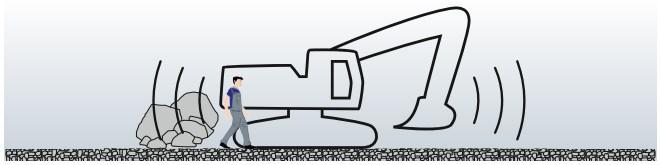
Anti-collision with stationary objects such as shelves,
vehicles or other obstacles

Detection of people or objects in the surroundings
for increasing safety and for automation



Anti-collision and detection of moving objects
crossing the path

Blind spot monitoring for large vehicles
Warns the driver of obstacles or moving objects

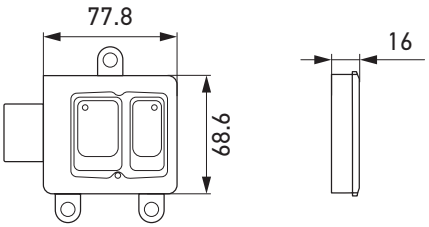


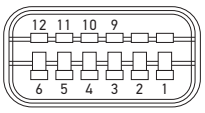
TECHNICAL DETAILS

Technical data	
Centre frequency	76.5 GHz
FOV azimuth	±75° (10 dBsm @ 20 m)
FOV elevation	±10° (10 dBsm @ 20 m)
Communication interface	CAN
Weight	< 100 g
Protection class	IP 6K7, IP X9K (*1)
Fixing	3 eyelets for M6 screws
Supply voltage	12 V / 24 V
Maximum quiescent current	100 µA
Minimum operating voltage	6.5 V at 12 V / 9 V at 24 V
Power	< 4 W
Operating temperature	-40 to +85 °C

*1: If the diaphragm is protected according to an installation guideline for pressure compensation

Dimensional sketch





Pinout

1	VCAN_H	5	WAKE	9	PCAN_H
2	VCAN_L	6	VBAT	10	PCAN_L
3	POS_3	7	–	11	POS_1
4	POS_2	8	–	12	GND

VARIANT OVERVIEW

Product image	Description	Protection class	Part number
	77 GHz radar sensor	IP 6K7, IP X9K*	**On request**

* If the diaphragm is protected according to an installation guideline for pressure compensation.