



preliminary

Technical Key Data (single sensor)

ultrasonic frequency	~ 48kHz
distance range	upto 2,5 – 3 m
electronics	new Bosch sensor specific IC (mixed signal)
dimensions diameter (membrane) diameter (housing) length (incl. membrane)	15 mm 23 mm 29/42 mm (rad./ax.)
weight	~ 20 g
operating temperature	- 40 °C to + 85 °C
supply voltage	8 V (regulated)
current consumption	≤ 6,5mA (Rx-mode) ≤ 500mA (Tx-mode)
connector (type and orientation)	different options available
protection class	IP 67K



Customer Benefits

- ➔ Reduced volume and weight of about 30 % (compared with current sensor generation 3 in series production)
- ➔ Improved vehicle integration regarding future regulations for pedestrian protection
- ➔ Variable connector configuration (different types and directional orientations available)
- ➔ Upto 2,5 - 3 m sensing range possible
- ➔ Different options of aluminum transducer surface treatment:
 - Black anodized as final sensor colour in black bumpers, spoilers or rubstrips
 - Chromatted or KTL-treated for later application of paint processes
- ➔ Depending on customer demands painted sensors are also available in final bumper colours (special logistic concept in manufacturing, handling and storage)
- ➔ In accordance with automotive requirements
- ➔ Modular platform for functional enhancement towards driver assistance systems

Measuring Principle

The pulse-echo-principle is used to calculate the distance between the ultrasonic sensor and the nearest obstacle from the time-of-flight of the closest reflected echo signal by applying ECU-based SW algorithms. In addition, cross echo signal evaluation improves the measurement accuracy via the triangulation calculation method in typical parking aid applications. Furthermore, sophisticated software algorithms are applied for almost simultaneous evaluation of all sensor echo signals, high measuring update rates and avoidance of mutual interferences.





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Features

- Ultrasonic sensor
 - for wide angle close range obstacle detection
 - typically used in parking aid applications
- Elliptical detection zone with appr. field-of-view (FoV) opening angles of
 - ± 60° @ -3dB horizontally
 - ± 30° @ -3dB vertically
- Transceiver element (transmit and receive function with one sensor)
- Single-wire bidirectional data link to ECU
- New development of sensor specific integrated circuit for sensor electronics with full transmit and receive electronic functions as well as programmable sensitivity characteristics in dependance of application requirements
- Programmable adjustment of detection sensitivity for different vehicle installation conditions
- Triangulation distance calculation method applied



Typical parking aid system configuration (maximum 12 sensors per vehicle)

Typical Applications

Earlier ultrasonic sensor generations (2 and 3) have been developed primarily for parking aid applications and are used in series production for a wide variety of vehicle models of car manufacturers.

Meanwhile front and/or rear applications with audible and/or optical driver warning interfaces are well introduced into the market.

Current Bosch development focus is on sensor/system progression with introduction of a new generation 4. Here the main objectives are larger detection ranges (up to 3m), programmable sensitivity for vehicle specific installation requirements, smaller overall dimensions, aluminum surface finishing in accordance with new EU-regulations, sensor painting for installation into coloured bumpers as well as manufacturing processes and quality.

Advanced parking aid functionalities like Parking-Space-Measurement (PSM) followed by guiding information during the subsequent reverse parking manoeuvre (SPA – Semiautonomous Parking Aid) are under intensive investigation in close cooperation with interested car manufacturers.

Main Arguments

- Wide market penetration with well proven technology
- Small package design for easy and unobtrusive vehicle integration
- Reliable detection within an optimized short range field-of-view
- Programmable sensitivity characteristics
- Optimum cost-benefit ratio

