SIGNAL CONDITIONING IC FOR DIRECT DRIVEN ULTRASONIC SENSORS

Features
- Transformerless direct transducer driver
- Programmable to transducer frequencies between 38kHz and 72kHz
- Bi-directional interface in 2-wire & 3-wire variants
- Supply voltage independent performance
- Optimized short & long range performance by:
  - active and passive damping mechanisms
  - sensitivity time control
  - optional automatic threshold generation
- Fully integrated digital signal conditioning
- Programmable transducer voltage & burst length
- Programmable receiver amplifier gain
- Digital envelope and threshold readout via test mode
- Transducer diagnosis information
- Embedded EEPROM for calibration data
- Chip ID for traceability

Applications
- Ultrasonic park assist systems (USPA, PAS,...)
- Industrial distance measuring
- Robotics

General Description
The device builds the core for a robust and easy-to-handle distance measurement system, while offering flexibility for customer applications.
A driver unit stimulates the direct connected ultrasonic transducer. Driver frequency, transducer voltage, burst length, amplifier gain and other parameters are user configurable. Active and passive damping mechanisms combined with STC (Sensitivity Time Control) and ATG (automatic threshold generation) optimize short and long range performance.
The received echo signal is amplified, converted and digitally processed. Customized obstacle interpretation is feasible by a variable detection threshold. In SEND Mode the circuit triggers the ultrasonic transducer while in RECEIVE ONLY Mode only indirect echo signals are detected.
Application relevant settings can be stored in EEPROM during an End-Of-Line calibration by the customer. For evaluation and debugging purposes, envelope and threshold data can be read out via test mode.
Communication with the control unit is possible via 2-wire or 3-wire configuration. The E524.05 supports a bi-directional communication via data modulation on the supply line. The E524.06 supports a dedicated IO-line for data transfer.

Ordering Information

<table>
<thead>
<tr>
<th>Ordering-No.</th>
<th>Temp Range</th>
<th>Interface</th>
<th>Package</th>
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<td>E52405A52C</td>
<td>-40°C to +105°C</td>
<td>2-wire</td>
<td>QFN20L4</td>
</tr>
<tr>
<td>E52406A52C</td>
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</tr>
</tbody>
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Typical Application Circuit

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Info Sheet

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