

# ZMID520x Inductive Position Sensor Family

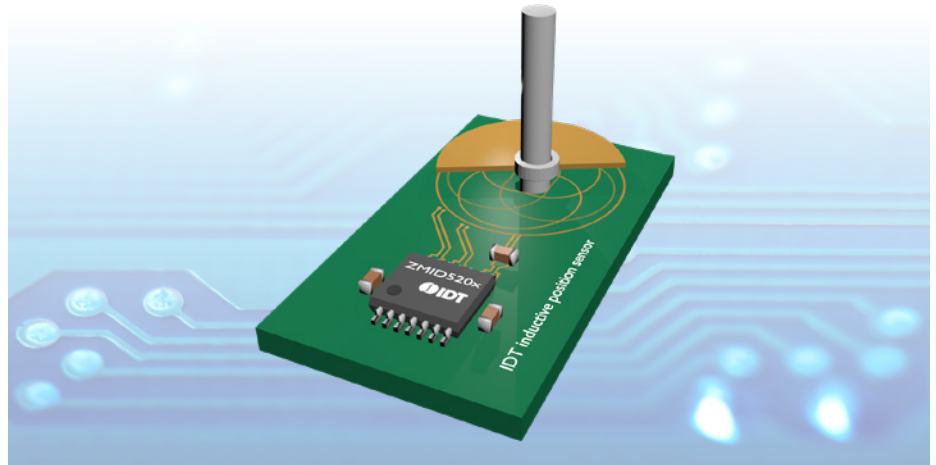
Contactless absolute position sensors for linear and angular position

## FEATURES AND BENEFITS

- Inductive based with no magnet required
- Simple metallic target immune to magnetic stray fields (ISO 11452-8)
- Flexible; same IC for a variety of position sensing applications
- Fully AEC-Q100-qualified
- Replaces potentiometer, Hall-effect and magneto-resistive technology
- Very thin assembly height
- Tolerant to target misalignment in any direction

## SPECIFICATIONS

- Analog, PWM and SENT output versions
- Only 3 wires: +5V, Ground, Output
- Non-volatile memory, programmable through output pin
- -14 to +18 V overvoltage and reverse polarity protection
- -40°C to +150°C ambient temperature range
- Coil temperature can be >150°C
- Suitable for safety-related systems compliant to ISO 26262 up to ASIL-B
- TSSOP-14 package



The ZMID5201, ZMID5202 and ZMID5203 family of inductive position sensors are designed for absolute position sensing in automotive, industrial and consumer applications.

This family utilizes the physical principles of induction in a wire loop and eddy currents to detect the position of a metallic target that is sliding or rotating above a set of coils consisting of one transmitter coil and two receiver coils. The three coils are typically

printed as copper traces on a printed circuit board and are used to detect the metallic target's position over the coils. After demodulating and processing the secondary voltages from the receiver coils, a signal representative of the metallic target's position over the coils is obtained.

The ZMID520x family is fully qualified to automotive standard AEC-Q100, grade 0 up to 150°C ambient temperature.

Typical Applications
Automobiles and other vehicles
Robotics and unmanned aerial vehicles (UAVs)
Automation
Home Appliances

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### PERFORMANCE

- Accuracy down to  $\pm 0.2\%$  full scale
- Resolution up to 4096 steps full scale
- Scalable accuracy and resolution
- Up to 10kHz output update rate
- 2.2 to 5.6 MHz oscillation frequency

### PROGRAMMING OPTIONS

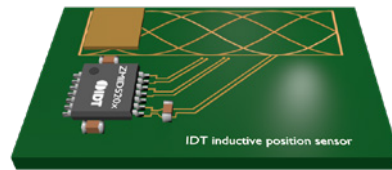
- 9-point linearization
- Input signal offset
- Input signal gain
- Slope of transfer function
- Analog clamping voltages
- PWM clamping duty cycles
- PWM base frequency
- SENT data format
- Various diagnostic diagrams
  - Oscillator failure
  - Coil failure
  - Supply voltage out of range
  - Missing target

Part Number	Description
ZMID5201	Inductive position sensor IC with analog output
ZMID5202	Inductive position sensor IC with PWM output
ZMID5203	Inductive position sensor IC with SENT output
ZMID5201STKIT	Inductive position sensing starter kit with arc, rotary, and linear modules

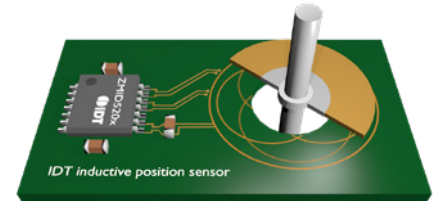
The same chip can be used for rotary, linear or other position sensing types by simply adapting the shape of the coils and the target. Additionally, the coil design can be scaled to smaller angles while maintaining the full

resolution and accuracy within the mechanical borders of the design. The moving target can be any solid metallic structure with a minimum thickness of a few micrometers.

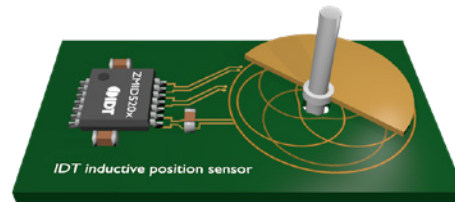
Linear position (any length)



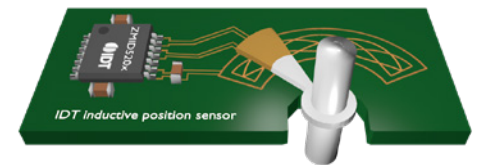
Side shaft off-axis rotation



End of shaft on-axis rotation



Narrow angles



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